



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

School of Health Care Sciences

Department of Occupational Therapy

**DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE GUIDELINES FOR
CLIENTS WITH SPASTIC CEREBRAL PALSY**

Degree: Doctor Philosophiae

Student name: Ninette du Plessis

Student number: 90215312

Supervisor: Prof K. Uys

Co-supervisor: Mrs T. L. Buys

Date: 22 November 2022





DECLARATION

I, Ninette du Plessis, student number 90215312 hereby declare that:

1. This dissertation, "*Development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy*" of thesis, is submitted in accordance with the requirements for the Doctor Philosophiae in Occupational Therapy at University of Pretoria.
2. I understand what plagiarism is and am aware of the University's policy in this regard.
3. I declare that this thesis is my own original work. Where other people's work has been used (either from a printed source, Internet or any other source), this has been properly acknowledged and referenced in accordance with departmental requirements.
4. I have not used work previously produced by another student or any other person to hand in as my own.
5. I have not allowed and will not allow anyone to copy my work with the intention of passing it off as his or her own work.

Signature

Ninette du Plessis

Witness Signature

Jannie du Plessis

Date

17 February 2023

ETHICS STATEMENT

The author, Ninette du Plessis, whose name appears on the title page of this dissertation, has obtained, for the research described in this work, the applicable research ethics approval.

The author declares that she has observed the ethical standards required in terms of the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.

Ethics Number: 774/2019

ACKNOWLEDGEMENTS

This study would not have been possible without the support of my supervisors, family and the study participants. I would like to express my sincere gratitude to:

- My supervisor, Prof Kitty Uys, for her strategic input, professional expertise, research knowledge and keeping me focused on the task I set out to accomplish. Prof, being supervised by you was a privilege.
- My co-supervisor, Tania Buys, for her keen eye on detail, ethical knowledge, emotional support and assistance going beyond and above any expectations. Tania, following your example is for me a lifegoal.
- The University of Pretoria for the Postgraduate Research Bursary awarded to me in 2020 and 2021.
- My husband, Jannie, who kept on believing in what I do even when I had my doubts and for the endless drawing and re-drawing of diagrams to explain my abstract ideas. Jannie, thank you also for all the “boring” reading that you did. You truly are my better half.
- My parents, Pa Francois for going through endless references to check for duplications, always encouraging and always believing in me. Ma Petra, for your unwavering support and encouragement and Ma Ingrid for hours of supportive telephone conversations.

I also wish to acknowledge and give thanks to the following people:

- Tarryn Stevens, my independent reviewer.
- Editor, Marietjie Schutte, your diligent work made a big difference.
- My children, MP, Tabita, David, Eunice, JP, Haydn and Mattias, with a special shoutout to Haydn for some of the graphics.
- Large extended family who helped in big and small ways, with a special thank you to Katie Pereira-Kotze for her emotional support and PhD knowledge and to Nicole Atkins for some graphics.
- Friends like Emma, Bridget, Michelle, Gita, EATASA committee, EFOT-UK committee, Greysouthen neighbours, Nicole, Alan and Wendy.

Last, but not the least, I would like to mention the expert panel by name – who's specific input will forever be anonymous. Thank you so much for all the hours you spent reviewing and commenting on guideline statements. Thank you also for your dedication and contribution to the scientific development of hippotherapy.

- Anne Foley, occupational therapist from South Africa.
- Sarah-Michelle Senécal, occupational therapist from Canada.
- Gina Taylor, occupational therapist from the United States of America.
- Merete Giørtz-Carlsen, physiotherapist from Denmark.
- Věra Lantelme-Faisan, physiotherapist from Czech Republic.
- Elizabeth Beckerlegge, physiotherapist from the United Kingdom.
- Pricilla Lightsey, physiotherapist from the United States of America.
- Kirsten Skjoldshøj, physiotherapist from Denmark.
- Ruth Dismuke-Blakely, speech and language pathologist from the United States of America.
- Shayn Loock, speech and language pathologist from South Africa.
- Professor Perry Flynn, speech and language pathologist from the United States of America.



ABSTRACT

The aim of this study was to develop transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy by involving occupational therapists, physiotherapists and speech and language pathologists from different countries to participate in the study.

When treating the spastic cerebral palsy population by using hippotherapy, guidelines will benefit hippotherapy providers to effectively plan and execute hippotherapy. However, few resources and no guidelines were found by the researcher, which revealed the need for guidelines that are transdisciplinary in nature and that encompass the hippotherapy concepts applicable to all three professions.

The guidelines were developed in three phases that used a qualitative, exploratory, descriptive, contextual research design.

In Phase 1, a theoretical enquiry was done through a scoping review that addressed objective one: To identify, describe and explore concepts that were referred to in selected literature to constitute hippotherapy practices for clients with spastic cerebral palsy. A total of 51 documents were analysed in the scoping review that led to the identification and description of 19 transdisciplinary hippotherapy concepts.

Phase 2 led to the construction of guideline statements. This phase firstly addressed objective two, namely: To explore transdisciplinary hippotherapy practices for clients with spastic cerebral palsy through the involvement of hippotherapy practitioners. Eleven therapists from six countries completed a questionnaire regarding the use of the hippotherapy concepts that were identified in Phase 1. Secondly, Phase 2 addressed objective three, namely: To construct practice guidelines for transdisciplinary hippotherapy by integrating the information gathered from objectives one and two.

Phase 3 led to 166 final transdisciplinary hippotherapy practice guidelines through a consensus-building process that addressed objective four, namely: To obtain consensus from an expert panel on the transdisciplinary hippotherapy practice guidelines using a modified Delphi technique. Eleven selected expert panel members took part in three Delphi rounds.



The 19 identified concepts provided a novel basis for hippotherapy research. Furthermore, the 166 newly developed transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy will help to structure future hippotherapy research, and more importantly, improve effective client outcomes for the spastic CP population.

Key Terms

Hippotherapy: Using the movement of a horse as a therapy tool.¹⁻³

Transdisciplinary: Sharing hippotherapy concepts and language between occupational therapists, physiotherapists and speech and language pathologists as well as encouraging collaboration to enhance client care.⁴⁻⁵

Cerebral palsy: A group of permanent, but not progressive, neurodevelopmental disorders of movement and posture that cause activity limitations.⁶⁻⁸

Spastic: From a tone-related classification point of view, the word “spastic” indicates a heightened tone that are seen in 80% of client with cerebral palsy.⁹⁻¹⁰

Guidelines: The purpose of practice guidelines in this study is to help the occupational therapists, physiotherapists and speech and language pathologists with decision-making regarding the treatment of a client by using hippotherapy.¹¹⁻¹³ Guidelines should never replace professional reasoning from the therapists.¹³⁻¹⁴

LIST OF ABBREVIATIONS

LIST OF ABBREVIATIONS AND ACRONYMS	
AHA	American Hippotherapy Association
CP	Cerebral Palsy
CPD	Continuing Professional Development
EATASA	Equine Assisted Therapy Association of South Africa
ICF	International Classification of Functioning, Disability and Health
GMFCS	Gross Motor Functional Classification System
MRC	Medical Research Council
OT	Occupational therapist
PT	Physiotherapist
SIGN	Scottish Intercollegiate Guidelines Network
SLP	Speech and language pathologist
WHO	World Health Organisation



TABLE OF CONTENTS

DECLARATION	II
ETHICS STATEMENT	III
ACKNOWLEDGEMENTS	IV
ABSTRACT.....	VI
LIST OF ABBREVIATIONS	VIII
TABLE OF CONTENTS.....	IX
CHAPTER 1.....	1
1 ORIENTATION TO THE STUDY.....	1
1.1 INTRODUCTION	1
1.1.1 History of hippotherapy.....	2
1.1.2 Background to the study.....	3
1.2 RESEARCH PROBLEM	4
1.3 RESEARCH QUESTION.....	5
1.4 RESEARCH AIMS AND OBJECTIVES	5
1.4.1 Aim	5
1.4.2 Objectives.....	5
1.4.3 Objective one	5
1.4.4 Objective two.....	5
1.4.5 Objective three	6
1.4.6 Objective four	6
1.4.7 Research phases	6
1.5 SIGNIFICANCE OF THE STUDY	7
1.5.1 The cerebral palsy population	7



1.5.2	Therapists.....	7
1.5.3	Scientific development	8
1.5.4	Education and training.....	8
1.6	DELINEATION.....	8
1.7	SUMMARY	9
1.8	OUTLINE OF THE THESIS	9
CHAPTER 2.....		12
2	LITERATURE	12
2.1	INTRODUCTION	12
2.2	CEREBRAL PALSY.....	12
2.2.1	Definition and characteristics of Cerebral Palsy	12
2.2.2	Cerebral palsy classification	13
2.2.3	Tone-related classification.....	14
2.2.4	Functional classification	14
2.2.5	Topographical or anatomical	15
2.2.6	Conclusion on cerebral palsy	15
2.3	TRANSDISCIPLINARY APPROACH	16
2.4	HIPPOTHERAPY	17
2.4.1	Complex interventions.....	17
2.4.2	Development of complex interventions.....	19
2.4.3	Conclusion on hippotherapy	28
2.5	GUIDELINES.....	29
2.5.1	Existing hippotherapy guidelines	30
2.5.2	Guideline development.....	31



2.5.3	Conclusion on guideline development.....	34
2.6	SUMMARY	35
CHAPTER 3.....		37
3	OVERARCHING METHODOLOGY OF THE STUDY	37
3.1	INTRODUCTION	37
3.2	POSITIONALITY	37
3.2.1	Philosophical perspectives	37
3.2.2	Ontology	38
3.2.3	Epistemology.....	38
3.2.4	Methodological assumptions	39
3.2.5	Position in relation to participants (therapists).....	39
3.2.6	Identity, personality and beliefs of the researcher	41
3.2.7	Research context	41
3.3	OVERARCHING METHODOLOGY.....	42
3.3.1	Study context.....	42
3.3.2	Research design	43
3.3.3	Conceptual framework	44
3.4	ETHICAL CONSIDERATIONS	46
3.4.1	General ethical considerations	46
3.4.2	Protection from harm.....	46
3.4.3	Autonomy	47
3.4.4	Confidentiality.....	48
3.4.5	Compensation	48
3.4.6	Publishing.....	48



3.5	RIGOUR	49
3.5.1	Credibility.....	49
3.5.2	Transferability.....	50
3.5.3	Dependability.....	50
3.5.4	Conformability	50
3.6	SUMMARY	51
CHAPTER 4.....		52
4	SCOPING REVIEW – PHASE 1.....	52
4.1	INTRODUCTION	52
4.2	POSITIONALITY DURING THE SCOPING REVIEW.....	53
4.3	SCOPING METHODOLOGY	53
4.4	APPLYING SCOPING METHODOLOGY TO THIS STUDY.....	55
4.4.1	Identify the research question for the scoping review.....	56
4.4.2	Identify the relevant documents.....	56
4.4.3	Selection of documents	57
4.4.4	Charting the data.....	61
4.4.5	Collating, summarising and reporting of results.....	68
4.4.6	Therapeutic relationships	68
4.4.7	Presentation principles	71
4.4.8	Structuring principles.....	73
4.4.9	Activity requirements	77
4.5	DISCUSSION OF THE RESULTS.....	81
4.5.1	Therapeutic relationship	82
4.5.2	Presentation principles	84



4.5.3	Structuring principles	85
4.5.4	Activity requirements	87
4.5.5	Conclusion on identified hippotherapy concepts	89
4.6	CONSULTATION WITH STAKEHOLDERS.	89
4.7	TRUSTWORTHINESS OF THIS SCOPING REVIEW.....	89
4.7.1	Credibility.....	90
4.7.2	Dependability.....	90
4.7.3	Conformability	90
4.7.4	Transferability.....	90
4.7.5	Authenticity.....	90
4.8	SUMMARY	91
CHAPTER 5.....		92
5	EXPLORATION OF HIPPO THERAPY PRACTICES AND GUIDELINE CONSTRUCTION - PHASE 2	92
5.1	INTRODUCTION	92
5.2	POSITIONALITY IN PHASE TWO	93
5.3	METHODOLOGY TO DEVELOP THE QUESTIONNAIRES	93
5.4	QUESTIONNAIRE DEVELOPMENT STEPS	95
5.4.1	Preliminary Considerations.....	95
5.4.2	Step one: Decide on the information to be obtained.....	95
5.4.3	Step two: Define the participants in the study.....	96
5.4.4	Step three: Choose the method(s) to reach the participants	100
5.4.5	Step four: Deciding on the content of the questions	100
5.4.6	Step five: Formulate the wording of the questions.....	102



5.4.7	Step six: Meaningful ordering and formatting of the questions	102
5.4.8	Step seven: Check the length of the qualitative questionnaire	103
5.4.9	Step eight: Pre-test the qualitative questionnaire	103
5.4.10	Step nine: Construct the final questionnaire	105
5.5	ADMINISTERING THE QUESTIONNAIRES	105
5.6	DATA ANALYSIS	108
5.6.1	Transcription.....	108
5.6.2	Reading and familiarisations	108
5.6.3	Coding across entire dataset.....	108
5.6.4	Searching for themes	108
5.6.5	Reviewing themes	110
5.6.6	Defining and naming themes.....	110
5.7	TRUSTWORTHINESS	111
5.8	FINDINGS	112
5.9	DISCUSSION	115
5.10	SUMMARY	117
CHAPTER 6.....		118
6	CONSENSUS PROCESS – PHASE 3.....	118
6.1	INTRODUCTION	118
6.2	POSITIONALITY DURING THE MODIFIED DELPHI TECHNIQUE	119
6.3	ETHICAL CONSIDERATIONS	119
6.4	METHODOLOGY	120
6.4.1	Design	120
6.4.2	Sampling method	120



6.4.3	The Delphi technique	122
6.4.4	Method of distributing each Delphi round	124
6.4.5	Level of consensus.....	125
6.4.6	Analysis of expert comments.....	125
6.5	APPLICATION OF THE MODIFIED DELPHI TECHNIQUE	125
6.5.1	Delphi round one	125
6.5.2	Delphi round two	129
6.5.3	Delphi round three.....	132
13	GUIDELINES	136
6.6	DISCUSSION	137
6.7	SUMMARY	137
CHAPTER 7	139
7	DISCUSSION.....	139
7.1	INTRODUCTION	139
7.2	POSITIONALITY	139
7.3	FINDINGS	140
7.3.1	Scoping review – Phase 1	140
7.3.2	Exploration of hippotherapy practices and guideline construction – Phase 2	141
7.3.3	Consensus process – Phase 3.....	142
7.4	TRANSDISCIPLINARY HIPPO THERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY	143
7.5	DISCUSSION OF THE GUIDELINES	173
7.5.1	Therapeutic relationship	174
7.5.2	Presentation principles	175



7.5.3	Structuring principles.....	176
7.5.4	Activity requirements.....	179
7.6	SUMMARY.....	183
CHAPTER 8.....		184
8	CONCLUSION AND RECOMENDATIONS.....	184
8.1	INTRODUCTION.....	184
8.2	FINDINGS.....	184
8.3	LIMITATIONS.....	186
8.4	RECOMMENDATIONS.....	187
8.5	SUMMARY.....	188
9	REFERENCES.....	189
10	ANNEXURE.....	209
10.1	INTRODUCTION.....	209
10.2	ANNEXURE A: ETHICS APPROVAL.....	211
10.3	ANNEXURE B: INFORMATION AND INFORMED CONSENT – PHASE 2.....	215
10.4	ANNEXURE C: INVITATION LETTER TO THE EXPERT PANEL.....	219
10.5	ANNEXURE D: INFORMATION INTERVIEW STRUCTURE – PHASE 3.....	221
10.6	ANNEXURE E: INFORMED CONSENT – PHASE 3.....	222
10.7	ANNEXURE F: CERTIFICATES OF PARTICIPATION IN PHASE 2.....	223
10.8	ANNEXURE G: CERTIFICATES OF PARTICIPATION – PHASE 3.....	225
10.9	ANNEXURE H: CONSENT TO BE MENTIONED BY NAME.....	228
10.10	ANNEXURE I: HIPPO THERAPY CONCEPTS IN SCOPING DOCUMENTS....	230
10.11	ANNEXURE J: FIRST DELPHI ROUND.....	236



10.12 ANNEXURE K: EMAIL TO HIPPOThERAPY ASSOCIATIONS AND THERAPISTS.....	262
10.13 ANNEXURE L: DEMOGRAPHIC INFORMATION FORM.....	266
10.14 ANNEXURE M: INFORMATION AND INFORMED CONSENT FOR DEMOGRAPHIC INFORMATION.....	270
10.15 ANNEXURE N: PILOT STUDY.....	274
10.16 ANNEXURE O: QUALITATIVE QUESTIONNAIRE ONE AND TWO.....	310
10.17 ANNEXURE P: CONSENSUS ON EXCLUSION.....	346
10.18 ANNEXURE Q: SECOND DELPHI ROUND.....	349
10.19 ANNEXURE R: THIRD DELPHI ROUND.....	428
10.20 ANNEXURE S: NON-CONSENSUS STATEMENTS.....	452

LIST OF FIGURES

Figure 1.1: Schematic representation of research objectives	6
Figure 3.1 Operational framework	45
Figure 3.2 Conceptual framework model	46
Figure 4.1: Phase 1 in the context of the study	52
Figure 4.2: Identification and selection of documents	57
Figure 4.3 Positioning of the client	75
Figure 5.1: Phase 2 in the context of the study	92
Figure 5.2: Participant selection	98
Figure 5.3: Example of topographic classification as case study	101
Figure 6.1: Phase 3 in the context of the study	118
Figure 6.2: Selection of the expert panel	120
Figure 6.3: Phase 3 – Modified Delphi technique	123
Figure 6.4: Delphi round one	126
Figure 6.5: Delphi round two	129
Figure 6.6: Delphi round three	133



LIST OF TABLES

Table 2-1 Complexity of hippotherapy	18
Table 4-1: Documentation used	58
Table 4-2: Hippotherapy concepts and definitions	62
Table 4-3: Hippotherapy concepts structured according to the treatment principles of VdMoCA.....	65
Table 5-1: Participant demographics and questionnaire return.....	106
Table 5-2 Number of guideline statements per concept at the end of Phase 2.....	112
Table 6-1: Consensus rates for Delphi round one	127
Table 6-2: Consensus levels for Delphi round two.....	131
Table 6-3: Consensus levels of Delphi round three	134
Table 6-4: Summary of final transdisciplinary hippotherapy practice guidelines	136



CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Hippotherapy can form part of the integrated, individualised treatment plan of a client with special needs.²⁻³ In hippotherapy, the movement of a horse is used as a treatment tool.¹⁻³ An occupational therapist (OT), physiotherapist (PT) and/or speech and language pathologist (SLP) plans, directs and executes this therapy to help the client (sitting on the moving horse) to achieve functional therapy goals.^{2-3,15}

Despite a lack of scientific evidence, training courses combining physiotherapy knowledge with knowledge of the effect of the movement of the horse on the client were presented in America from the 1980's.¹⁶ In Germany the "Deutsche Kuratorium Für Therapeutisches Reiten" was founded in 1970, but it is not clear when they started teaching on hippotherapy.¹⁶ Since then different countries founded their own organisations that promoted hippotherapy and presented courses to OTs, PTs and SLPs. For instance, the American Hippotherapy Association (AHA) was founded in 1992¹⁶⁻¹⁷ and the Equine Assisted Therapy Association of South Africa (EATASA) was founded in 2010² to name but two.

Reviews have shown that research in hippotherapy, which started in the 1980's, and is still ongoing, was mostly conducted with the cerebral palsy (CP) population.^{3,18} Until now, mostly hippotherapy outcome studies were published that are indicative of the early phases of scientific development of complex interventions.¹⁹⁻²² These outcome studies give limited information on the specifics of how the hippotherapy was done. In other words, the "active ingredients" of hippotherapy have not comprehensively been described, published or structured.³ In this study, the "active ingredients" and the idea of how they contribute to hippotherapy are called hippotherapy concepts.

As there is limited information on how to conduct hippotherapy, therapists from all three professions were left with few resources other than course notes, and little guidance.



Therefore, this study developed transdisciplinary hippotherapy practice guidelines for clients with spastic CP by involving therapists from different countries and all three professions, rendering it transdisciplinary in nature.

This chapter provides an overview of the study by first discussing the history of hippotherapy and background of the study, followed by the research problem, the research question, aims and objectives, the significance, and finally, the scope of the study.

1.1.1 History of hippotherapy

Using the movement of the horse as a treatment tool developed in parallel and with different emphasis in different countries, especially since the 1960's.¹⁶ Originally, English-speaking countries focused on recreational and sports riding, Scandinavian countries took part in equine competitions and Germanic countries focused on rehabilitation through the movement of the horse.¹⁶ After Liz Hartel – a Scandinavian dressage rider affected by polio – won a silver medal at the 1952 Olympics in Helsinki, “horseback riding for the disabled” gained more interest in the United Kingdom.^{3,16} From there “riding for the disabled” spread throughout Europe, North America, Australia and New Zealand.^{3,16} In 1973 the South African Riding for the Disabled Association was established in Cape Town.² The goal of “horseback riding for the disabled” was to teach clients with disabilities to ride a horse and to take part in sport riding, should they wish to.^{2,16}

Once OTs and PTs became involved in “riding for the disabled”, rehabilitative possibilities were discussed by therapists at various international conferences on therapeutic riding.¹⁶ Cultural differences between different countries influenced the development of the clinical use and training programmes for medical use of the movement of a horse, but it was the Swiss that created the term “hippotherapy”, as “hippo” is the Greek word for “horse”.¹⁶ In Germany and the United Kingdom, it was mostly PTs that used hippotherapy and in North America, both PTs and OTs were actively involved in the development of hippotherapy as a treatment strategy.¹⁶ It is unclear when and in which country SLPs started using the movement of the horse in therapy, but SLPs are now fully integrated into the hippotherapy training programmes in many countries such as North America, South Africa and Brazil.^{2,14,23} The first mention of the effect of horseback riding on language disorders, that the researcher could find, was published in 1981.²⁴



When EATASA was founded in 2010, all three professions were recognised as providers of hippotherapy. In the South African context, PTs focus on developing and treating neuro-musculoskeletal and movement-related body functions and body structures, using the movement of the horse to facilitate and challenge movement, leading to increased mobility during participation in activities.² Occupational therapists focus on enhancing participation in all activities by using the movement of the horse to both facilitate movement and motivate the client. They also focus on body functions such as mental functions, sensory functions and neuro-musculoskeletal and movement functions.² Speech and language pathologists focus on strengthening body structures such as core and intercostal muscles related to voice and speech, through the movement of the horse to stimulate the body function of voice and speech. This is done in combination with vestibular input. The goal is to improve the activity participation of communication, interpersonal interactions and relationships. Speech and language pathologists also use the horse to motivate the client to communicate both verbally and non-verbally.²

1.1.2 Background to the study

The specific aspects that are reflected in the title of this study (guidelines, transdisciplinary, spastic cerebral palsy) came from the researcher's different professional roles and experiences and will be presented to the reader in the order that these aspects developed in the mind of the researcher to become the research question and aim of this study.

In South Africa, hippotherapy courses are presented to OTs, PTs and SLPs by EATASA. The researcher served on the EATASA board from 2012 until now. In this role, she frequently received questions from therapists seeking advice on hippotherapy specifics when planning treatment. These questions reflected the need for advice within different diagnostic groups when using hippotherapy as a treatment strategy. To answer these questions the researcher had to draw on her own experience, as the EATASA course does not detail the treatment of specific diagnostic groups, and only a few books exist that only address fragmented aspects of hippotherapy.^{1,15-16,25-28} Furthermore the AHA's practice guidelines only focus on hippotherapy providers, professionalism and safety and also do not answer questions on how to plan or execute hippotherapy.¹⁴ Peer reviewed articles^{3,29-31} give limited information on the details of the content of hippotherapy or the different concepts that need to be taken

into consideration when using hippotherapy as a treatment strategy. The questions about hippotherapy specifics and the lack of supporting data directed the researcher's attention towards the need for the development of transdisciplinary hippotherapy practice guidelines. This notion was further amplified by the view of the World Health Organisation (WHO) that guidelines can lower uncertainty within a field.¹¹

The EATASA programmes provide training on an integrated unity of knowledge beyond disciplines that can be defined as transdisciplinary.⁴ With this South African hippotherapy background, the researcher started working in a hippotherapy centre in Abu Dhabi as an occupational therapist in 2015. There she became aware of the deep pool of collective knowledge and experience among fellow therapists using hippotherapy as a treatment strategy that, until now, was not documented or formally shared. Seeking to understand hippotherapy from the perspective of therapists working in different countries and in different professions led to the transdisciplinary focus of this study.

The pragmatic decision on the population for whom the guidelines were developed came from the fact that CP is the most prevalent childhood disability,^{9,32} and that peer-reviewed studies on hippotherapy frequently focused on the CP population^{3,18,33-34} – and therefore, providing a wider literature base. To further focus the guidelines, the spastic group that represents 70-77% of the CP population was chosen.⁹⁻¹⁰

The questions about hippotherapy specifics from OTs, PTs and SLPs, combined with the realisation of the knowledge pool across professions and the focus on the spastic CP population, thus led to the research question and aim of this study.

1.2 RESEARCH PROBLEM

The spastic CP population (the largest childhood disability group)³⁵⁻³⁶ are treated by OTs, PTs and SLPs with hippotherapy, among various other treatment strategies.^{9,16} The three therapy professions can attend the same hippotherapy courses and use the same hippotherapy treatment principles when applying their professional reasoning within their own scope of practice to fulfil their ethical obligation to provide high-quality services. Clients and medical insurance companies require research evidence that supports improved clinical

therapeutic outcomes, as hippotherapy is costly since at least three people and a horse are involved in each treatment session for one client.

As there are few resources and no guidelines to guide therapists in their professional reasoning to effectively plan and execute hippotherapy, the need for guideline development was identified. These guidelines needed to be transdisciplinary in nature to encompass the hippotherapy concepts applicable to all three professions. However, before transdisciplinary guidelines could be developed, the different concepts that constitute hippotherapy had to be identified, as this has not previously been done. Furthermore, given the early stages of scientific development of hippotherapy as a complex intervention, transdisciplinary guidelines had to be developed with the help of experienced therapists in the field in a systematically phased approach.

These guidelines will help structure future hippotherapy research, but more importantly, effective client outcomes for the spastic CP population will be improved with transdisciplinary hippotherapy practice guidelines.

1.3 RESEARCH QUESTION

What are the transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy?

1.4 RESEARCH AIMS AND OBJECTIVES

1.4.1 Aim

To develop transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

1.4.2 Objectives

1.4.3 Objective one

To identify, describe and explore concepts that are referred to in selected literature to constitute hippotherapy practices for clients with spastic cerebral palsy.

1.4.4 Objective two

To explore transdisciplinary hippotherapy practices for clients with spastic cerebral palsy through the involvement of hippotherapy practitioners.

1.4.5 Objective three

To construct practice guidelines for transdisciplinary hippotherapy by integrating the information gathered in objectives one and two.

1.4.6 Objective four

To obtain consensus from an expert panel on the transdisciplinary hippotherapy practice guidelines using a modified Delphi technique.

1.4.7 Research phases

This study consisted of three phases to answer the four objectives. Figure 1.1 presents these stages indicating how the transdisciplinary guidelines were developed.

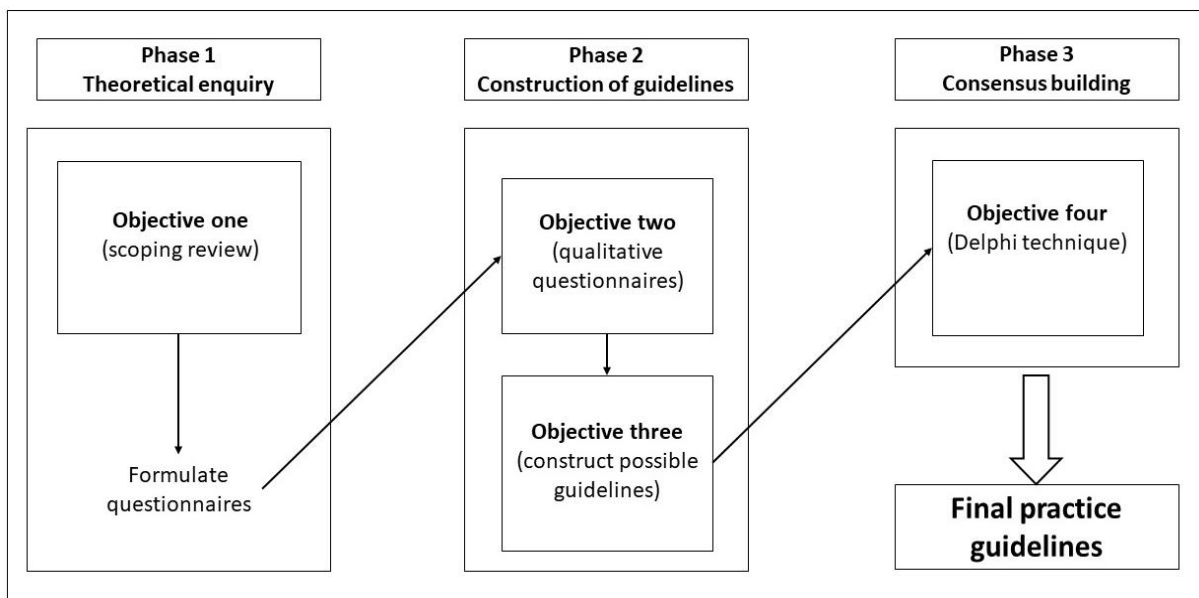


Figure 1.1: Schematic representation of research objectives

A qualitative, exploratory, descriptive, contextual research design was used to gain an understanding of real-life hippotherapy and to develop the guidelines through a phased approach.

Within the first phase of the study, hippotherapy concepts were identified, described, and explored to achieve objective one.

The second phase of the study investigated how the hippotherapy treatment principles with their concepts are applied transdisciplinary by experienced therapists around the world to

achieve objective two (in the light of limited evidence).¹³ This phase led to the development of possible hippotherapy practice guidelines to achieve objective three.

These possible guidelines, in the form of guideline statements, were then subjected to a consensus process in the third phase of the study that further filled the evidence gaps to create final transdisciplinary hippotherapy practice guidelines for clients with spastic CP.¹³ This process achieved objective four.

1.5 SIGNIFICANCE OF THE STUDY

This study contributes to the hippotherapy treatment of clients with spastic CP, the knowledge of therapists treating them, the scientific development of hippotherapy and education and training within the hippotherapy field.

1.5.1 The cerebral palsy population

The guidelines focus on specific groups within the spastic CP population by using a topographic classification combined with the levels of the Gross Motor Functional Classification System (GMFCS). Consequently, these guidelines enhance the appropriateness of the hippotherapy recommendations that lead to better patient outcomes and improved cost-effectiveness.

1.5.2 Therapists

In the past, both experienced and novice OTs, PTs or SLPs were left with course notes (if courses were available in their country) and their own professional reasoning to formulate and execute hippotherapy to treat clients with spastic CP. There were no guidelines to guide the professional reasoning process about the different hippotherapy concepts. These concepts were identified in this study and guidelines on the use thereof for the spastic CP population were developed to assist therapists to make more informed decisions during every stage of the hippotherapy process.

Inclusion of hippotherapy into the scope of practice of OTs, PTs and SLPs was not an objective of this study but might contribute to the inclusion of hippotherapy within the scope of practice of all three these professions in countries where hippotherapy is not yet acknowledged as such.



1.5.3 Scientific development

By identifying the concepts involved in hippotherapy, this study contributes to the understanding of hippotherapy during the early phases of the scientific development of this complex intervention.^{3,11,37-38}

The guidelines can be used as reference in future research to define the specifics of hippotherapy within studies. Moreover, recommendations in the guidelines can be tested and debated in future studies to further the scientific knowledge base within the hippotherapy field.

Lastly, the guideline development process of this study set a standard for future hippotherapy guideline development for other diagnostic groups.

1.5.4 Education and training

Transdisciplinary hippotherapy practice guidelines, developed as an outcome of this research, will serve as a reference for hippotherapy training. By incorporating the 19 hippotherapy concepts within four treatment principles, course attendees will gain a thorough understanding of what hippotherapy entails and the application thereof when treating clients with spastic CP.

1.6 DELINEATION

The main purpose of this study was to develop transdisciplinary hippotherapy practice guidelines for clients with spastic CP that will advise therapists on the application of hippotherapy concepts when treating clients with spastic CP and direct future research. The intention of these transdisciplinary guidelines was and is to assist therapists in planning and executing hippotherapy, but not to replace sound professional (clinical) reasoning.

As the study was done through the University of Pretoria, the titles used for different therapy professions were those used in South Africa, namely occupational therapists (OTs), physiotherapists (PTs) and speech and language pathologists (SLPs). When treating clients with spastic CP through hippotherapy OTs, PTs and SLPs focus on addressing different body functions, structures and activity participation from their own disciplinary perspectives. Yet, they all use the movement of the horse and the same hippotherapy treatment principles

to achieve their respective therapy goals. Therefore, the guidelines on the use of these treatment principles were termed transdisciplinary.

Therapists from as many countries as possible were targeted through a snowball technique to take part in the study. Inclusion and selection criteria were applied for phases two and three as described in Chapter 5 and Chapter 6.

Therapy, where a therapist is riding on the horse with a client, was not included in the hippotherapy practice guidelines as EATASA deems this practice unsafe.² The guidelines focus on hippotherapy (where the client is mounted). The focus of this study was not on groundwork or any other therapy that involves horses.

The term “hippotherapy horse” was used throughout these guidelines and encompasses all equines, including ponies that are used for hippotherapy.

Formulating new theories on why therapists deem certain aspects of hippotherapy important or why certain hippotherapy techniques are perceived as beneficial to clients with spastic CP was beyond the scope of this study, but therapists were asked what theoretical frameworks they already use.

1.7 SUMMARY

This chapter set the scene for the reader to understand why and how transdisciplinary hippotherapy practice guidelines for clients with spastic CP were developed. Within the early phases of scientific development of hippotherapy research, there were research gaps that had to be addressed before guidelines could be developed. This study was conducted in three phases to address the four objectives of this study, namely, to identify hippotherapy concepts, to explore hippotherapy practices, construct possible guidelines, and finally, to reach consensus by an expert panel on the final transdisciplinary hippotherapy practice guidelines.

1.8 OUTLINE OF THE THESIS

The thesis is divided into eight chapters as outlined below.

Chapter 1 orientates the reader to the study by firstly describing the history of hippotherapy and to distinguish between “riding for the disabled” and “hippotherapy”. Then, the chapter

informs the reader on the background that led to the specific aspects within the title of the study, research problem, research question, aims and objectives, introduction to the research methodology, significance, and lastly, the scope of the study. In the scope of the study, both the delineation and limitations are addressed.

Chapter 2 is the literature review and addresses CP and specifically the different classifications used in this study. Secondly, the transdisciplinary nature of the study is explained. Thirdly, the researcher explains why hippotherapy can be seen as a complex intervention and how the scientific development of complex interventions concerns hippotherapy. Fourthly, available hippotherapy guidelines are discussed so that the reader can distinguish between available guidelines and the contribution of this study to guidelines in the hippotherapy field of this study. Lastly, the reader is informed on the process of guideline development.

Chapter 3 starts with a description of the researcher's positionality and philosophical stance. The broad study context is explained and discussed before the research design is given and the conceptual framework of the study is dissected. Then ethical considerations that apply to all the phases of the study are described followed by definitions of rigour and trustworthiness and how they are applicable to this study.

Chapter 4 gives a full account of the scoping review (Phase 1 of the study). The researcher starts by stating her positionality regarding the scoping review. Secondly, the six stages of the scoping methodology are explained. Thirdly, the application of each stage of the scoping review is described as the core focus of Chapter 4, where reporting the scoping results and details on the structuring thereof are covered in stage 5. Fourthly, a discussion of the results is given followed, lastly, by a discussion of the trustworthiness of this scoping review.

Chapter 5 gives a full account of the construction of guideline statements (Phase 2 of the study) that used qualitative questionnaires to explore hippotherapy practices in different countries before formulating the guideline statements. Again, the researcher states her positionality in this phase of the study. The methodology to develop the questionnaires and results thereof that led to the construction of transdisciplinary hippotherapy practice guideline statements are described in detail in this chapter.

Chapter 6 focuses on consensus building (Phase 3 of the study), where a modified Delphi technique was used to reach consensus on the guideline statements to be included or excluded from the final hippotherapy practice guidelines. The researcher again starts with her positionality regarding this phase before the methodology and results of each Delphi round are described. Chapter 6 ends with a discussion on the trustworthiness of this phase.

Chapter 7 discusses the study and the developed guidelines. The chapter reflects on how the study influenced the researcher's positionality. The chapter then provides a summary of the key findings of each phase of the study. The newly developed transdisciplinary hippotherapy practice guidelines for clients with spastic CP are presented to the reader before the guidelines are discussed.

Chapter 8 concludes the study by discussing the findings of the study, dissemination thereof, and the limitations. Lastly, the researcher makes recommendations for further scientific development of hippotherapy as complex intervention, based on the knowledge added by this study.

CHAPTER 2

LITERATURE

2.1 INTRODUCTION

This chapter gives a thematic description of the literature applicable to the study. The description and classification of CP is the first theme in this chapter, as clients with CP are the diagnostic group that the guidelines are developed for.

Secondly, the transdisciplinary approach and how it applies to hippotherapy are explained.

Thirdly, the broader research done on hippotherapy, and how it fits into the scientific development of hippotherapy as a complex intervention, are described. This is needed to understand how this study fills research gaps and contributes to furthering the science of hippotherapy.

Lastly, literature on guideline development is described to give the reader an understanding of existing guidelines and the guideline developing phases as advised by authoritative organisations, that were used and adapted for this study.

2.2 CEREBRAL PALSY

According to Novak,⁹ Rosenbaum³⁶ and Vitrikas, Dalton and Breish,⁸ CP is the most dominant physical disability in childhood with 2.5 estimated cases per 1000 live births in first world countries and thus not an unfamiliar condition. CP is also the diagnostic group most often mentioned in hippotherapy studies.^{3,16}

To obtain the information on CP the researcher used the key phrases: “definition of cerebral palsy” and “classification of cerebral palsy” in Google scholar and PubMed. She also used the International Classification of Functioning, Disability and Health (ICF) from the WHO.³⁹

2.2.1 Definition and characteristics of Cerebral Palsy

Although many attempts have been made to define CP, a comprehensive and accurate definition is hard to find,⁴⁰⁻⁴¹ partly due to the functional differences between clients with CP. The definition that is used for this study was compiled from various literature sources, as follows: Cerebral palsy describes a group of permanent, but not progressive,^{6-7,41} neurodevelopmental disorders of movement and posture^{6,8,41} that cause activity

limitations.⁶⁻⁷ This closely resembles the definition proposed by Bax et al.⁴⁰ in 2005 and used by Rosenbaum et al.⁶ in 2007 namely: “a group of disorders of the development of movement and posture, causing activity limitations that are attributed to non-progressive disturbances that occurred in the developing foetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication, perception and/or behaviour, and/or by seizure”.

From these definitions, it is clear that CP has the following characteristics.

- CP is a condition of the developing brain and is, therefore, neurological in nature.^{7-8,36}
- CP is permanent and cannot be cured, but symptoms can change.^{6,9,36}
- Movement, balance and coordination are affected, causing activity limitations.^{6,8,36}
- Other conditions such as epilepsy, learning difficulties, behavioural challenges and sensory impairments may accompany CP.^{6,8,36}
- Each individual with CP has a unique combination of symptoms.⁹

Clients with CP experience significant variability in clinical features (affected body functions and their consequences),⁸ sensory lesions; affected perception; affected cognition; communication difficulties; behavioural problems; epilepsy; secondary musculoskeletal problems; sucking; swallowing and chewing difficulties; hearing problems; and, poor eyesight, to name but a few.^{6-9,36} Basic body functioning such as muscle strength, coordination, and muscle tone can be affected.^{6,36} Affected body functions result in strenuous functional task performance, such as walking, achieving self-care, swallowing and communicating,⁷ which in turn contribute to decreased involvement in community, school, and family activities, and therefore, an impact on quality of life.^{7,36} Cerebral palsy creates stressors for caregivers to various degrees.³⁶ Therefore, different interventions such as hippotherapy seek to improve body function, structure and activity participation of clients with CP.

2.2.2 Cerebral palsy classification

Professionals, including OTs, PTs and SLPs, involved in the treatment and management of CP view the condition from different angles (depending on their field of expertise) and,

therefore, various classification systems exist.⁴² There are anatomic,⁴³ topographic,^{8-9,36} function-based,⁸⁻⁹ muscle tone-related,^{8,43} and combinations of these classification systems.⁸ For the purpose of this study, widely used classification systems familiar to therapists and that describe both function, severity and topography were needed because clients from different classification groups need different treatments and the guidelines, therefore, differ as well. These classification systems are described below.

2.2.3 Tone-related classification

From a muscle tone classification point of view or as Bax et al.⁴⁰ describes it, “type of motor disorder” point of view, there are three major types of CP namely spastic (heightened tone with stiff muscles) in +/- 80% of cases,⁸⁻¹⁰ dyskinetic (uncontrollable movements) in 10-20% cases and ataxic (poor coordination) in 5-10% of cases, or a combination of the three.^{6,8} For this study, the spastic group was selected as the target group for the transdisciplinary guidelines, as reflected in the title.

2.2.4 Functional classification

For the classification purpose of this study generalisable functional descriptions of each diagnostic group were needed that are familiar to therapists taking part in the study. As the ICF organises and documents information on functioning and disability,³⁹ the researcher contemplated the use thereof within this study. The ICF conceptualises functioning as a “dynamic interaction between a person’s health condition, environmental factors and personal factors and can be descriptive in numerous manners”,⁴⁴ but had too many variables for structured guideline development and was, therefore, not used.

Rosenbaum et al.³² on the other hand developed three classification systems that describe the levels of functioning regarding gross motor, manual and communicative function in children with CP. These classification systems present a five-level qualitative description that is based on empirical rather than statistical evidence that also embraces some of the concepts in the ICF. The three classification systems are: the Gross Motor Function Classification System (GMFCS), the Manual Ability Classification System, and the Communication Function Classification System. Within this study, the focus was on the GMFCS because

predominantly movement disorders are described when CP's features are mentioned.^{8,40} The CMFCS further combines the movement description with an indication of severity.

The GMFCS^{6,36} was the first classification system for clients with CP; developed in Canada in 1997,⁴² and is still used by health care providers and researchers.⁸⁻⁹ The GMFCS introduced a universal language between health professionals on the gross motor ability of clients with CP.⁴⁵ The GMFCS is reliable, stable, and easy to use^{43,45} in both clinical and research settings.⁹ To give the reader an idea of the different levels within GMFCS Level I and Level V are explained. Level I is used for a client who is able to walk independently, but who has some difficulties in advanced motor skills. Level V, on the other side of this system, indicates extreme difficulty in self-mobility, even with the use of assistive devices. This classification (all five levels) was used in this study in combination with a topographical classification system as used by Vitrikas, Dalton and Breish.⁸

2.2.5 Topographical or anatomical

A classification according to topographical or anatomical distribution refers to the body parts that are affected^{36,40} and is useful for intervention purposes as some interventions are only indicated for certain topographic groups.⁹ This classification is often used in combination with other classifications.

Within a topographic classification the following terms might be used:

- Diplegia, when the legs are usually more affected than the upper body.³⁶
- Hemiplegia, where the one side of the body is more affected than the other side.³⁶
- Triplegia, where three limbs are affected.³⁶
- Quadriplegia, where all four limbs are affected.³⁶

Novak used a topographical classification when dividing the CP population into 23% quadriplegia, 39% hemiplegia and 38% diplegia,⁹ but they did not mention the term triplegia. This same classification was used within this study.

2.2.6 Conclusion on cerebral palsy

Cerebral palsy is a complex neurological condition that OTs, PTs and SLPs treat to improve body function, structure and activity participation. To set goals according to the individual

needs of each client, clients with CP are classified via different classification systems, as explained in this chapter.

The tone-related classification namely “spastic CP” as used in the title of this study refers to heightened muscle tone. Within the study, more specific classifications were needed and the topographical distribution (to describe specific body parts that are affected) in combination with the GMFCS (a functional classification with an indication of severity) were then used. It was considered during the development of the transdisciplinary hippotherapy practice guidelines how to apply each of the 19 hippotherapy concepts to these different CP classification-groups.

Because OTs, PTs and SLPs use hippotherapy as a treatment tool, the transdisciplinary approach of this study will be discussed next.

2.3 TRANSDISCIPLINARY APPROACH

To understand the term “transdisciplinary” and how it applies to hippotherapy the researcher used the key phrases: “transdisciplinary” “multidisciplinary”, “interdisciplinary” and “trans-disciplinarity” in a general search in the Department of Library Services of the University of Pretoria’s online services. She also added the words “... health care” to all the terms already mentioned. This strategy was applied in 2019 and repeated in 2022 when this chapter was updated.

As mentioned in the introduction (Chapter 1), OTs, PTs and SLPs all attend the same hippotherapy courses before using the movement of the horse to achieve therapy goals. By applying the same hippotherapy concepts that transcend disciplines, these concepts can be described as transdisciplinary in nature.⁴ The focus of this study on how these hippotherapy concepts are used and should be used by all three of these professions.

A reality in South Africa is that clients that need integrated therapy beyond any individual discipline, can often only attend therapy provided by one of these disciplines.^{4,46} This necessitates shared conceptual guidelines where a blurring of disciplinary boundaries occurs.⁴⁷⁻⁴⁸ By sharing a conceptual framework, concepts, theories and approaches from multiple disciplines^{47,49} more comprehensive therapy can be delivered.⁵ As Nandiwada and Dang-Vu⁴⁶ describe it: “Transdisciplinary health care also involves reaching into the spaces

between the disciplines to create positive health outcomes through collaboration”. Yet “transdisciplinary” does not imply that professional identity should be discarded.⁴⁷ It rather suggests a shared language and respect for collaboration, leading to the swift interplay between team members.⁴⁷ It also implies the release of stereotyped roles and role perceptions, hierarchical relationships, and jargon frequently linked to professions.⁴⁶⁻⁴⁷

Transdisciplinary guidelines will free therapists from stereotyped roles and discipline-specific language and create awareness of the totality of the difficulties that clients are faced with.⁵ Broadening of each profession’s knowledge base will lead to the efficient delivery of hippotherapy and a higher likelihood of reaching functional goals for clients⁴ that will also be more cost-effective.

2.4 HIPPO THERAPY

To map out where the existing hippotherapy research fits into the scientific development process, the researcher first had to plot hippotherapy on the spectrum between simple interventions and complex interventions. Therefore, the researcher begins this section by explaining when (according to literature) an intervention can be labelled as a complex intervention. She then compares complex intervention components with hippotherapy concepts to confirm hippotherapy as a complex intervention.

Secondly, the development phases of complex interventions are described and existing hippotherapy research is linked to each phase, informing the reader on the state of scientific development in hippotherapy and where gaps in the scientific development exist.

To find studies on hippotherapy the keywords “hippotherapy”, “equine-assisted therapy” and “equine facilitated therapy” were entered into Pubmed and EBSCOhost in early 2019. The search was repeated and expanded during different phases of the study. The 2019 mapping review from Wood et al.³ came to the researcher’s attention in September 2019 and this chapter was then updated and informed by their comprehensive mapping review.

2.4.1 Complex interventions

The researcher used the keywords “complex intervention” “intervention development” and “development of complex interventions” in Google Scholar that led her to intervention development articles.^{37-38,50-51}

There is not a clear-cut definition for simple interventions or for complex interventions, but there is a list of components that indicates complexity, as specified by the Medical Research Council (MRC) in the UK.^{38,50,52} These interacting components are depicted in Table 2-1. Corresponding hippotherapy components are listed alongside each of the intervention components to illuminate why hippotherapy is regarded as a complex intervention.

Table 2-1 Complexity of hippotherapy

Intervention components that determine complexity	Hippotherapy examples
<p>Number of interacting components³⁷ and how these components interact with one another.³⁸</p>	<ul style="list-style-type: none"> • Therapists providing therapy.⁵³⁻⁵⁶ • Human team members.^{29,53,57-58} • Horse temperament.^{2,30,54,57} • Horse size.^{56,59-60} • Movement of the horse.^{34,54,57-58,61} • Positions of the client on the horse.^{34,53,62-63} • Activities (therapeutic exercises) while on the horse.^{30,34,57-58,64-67} • Ground courses in which the horse is directed to walk.^{54,56-57,68-70} • Tack.^{53,64,68,71-72} • Equipment.^{34,68,73-74}
<p>Range of behavioural possibilities in the providers, the intervention itself and the clients receiving the intervention.³⁷⁻³⁸</p>	<p>Each client that is treated has his/her own behavioural possibilities and so does the hippotherapy team that consists out of a therapist, side walker, horse handler and horse.</p> <p>The number of people present within a hippotherapy session makes the behavioural possibilities indefinite.</p>
<p>Number of diagnostic groups that are intended to benefit from the intervention.³⁷⁻³⁸</p>	<ul style="list-style-type: none"> • Attention deficit hyperactive disorder.⁷⁵⁻⁷⁷ • Autism spectrum disorder.⁷⁸⁻⁸⁰ • Cerebral Palsy.^{53,55,70,78,81-83} • Cerebro vascular accident.^{34,84} • Down syndrome.^{78,85-86} • Intellectual disorder.⁸⁷⁻⁸⁹ • Language disability.⁹⁰

Intervention components that determine complexity	Hippotherapy examples
	<ul style="list-style-type: none"> • Muscular dystrophy.⁷⁸ • Multiple sclerosis.⁹¹⁻⁹³ • Traumatic brain injury.^{34,94} • Visual impairment.⁹⁵
Number of variable outcomes. ³⁷ (This component was not present in the 2021 update of the MRC framework).	Wood and Fields ³ found 690 quantitative outcomes in the articles within their mapping review.
Degree of tailoring permitted within the intervention. ³⁷⁻³⁸	All the interacting components mentioned within this table can be graded or tailored to the client's needs. ²

Skivington et al.³⁸ stated and elaborated on the idea that besides the intervention components, complexity is also influenced by context.³⁸ Evidence in Table 2-1 indicates that hippotherapy can be termed a “complex intervention”. Wood and Fields³ further strengthen this idea of complexity by observing that after 1998, hippotherapy as a treatment strategy and its implementation broadened across its components even without expanding on the different contexts in which hippotherapy can be implemented.

2.4.2 Development of complex interventions

The framework for the development and evaluation of complex interventions was first published by the MRC in 2000⁹⁶ and revised in 2006.⁵² In 2013 Craig and Petticrew³⁷ summarised this revision. In 2021 Skivington et al.³⁸ authored an update to the MRC framework and addressed some of the remaining weaknesses and gaps. This update was needed as the field of complex intervention research was developing rapidly with new difficulties and solutions that needed documenting.³⁸

Both Skivington et al.³⁸ and Craig and Petticrew³⁷ focused on three non-linear phases, namely feasibility, evaluation and implementation. Whyte and Barrett,⁵¹ on the other hand, authored a 2012 article on translational research in rehabilitation, resembling research phases in pharmaceutical research as well as the original MRC framework.⁹⁶ Thus all three of these authors were involved in the scientific development and research of interventions through a phased approach.^{37-38,51}

In this study, the development of complex interventions is explained through these authors' respective lenses. While Whyte and Barrett⁵¹ focused on interventions for rehabilitation research, irrespective of their complexity, Craig and Petticrew³⁷ and Skivington et al.,³⁸ specifically focused on “complex interventions”.

According to these authors, when converting scientific knowledge into effective interventions, several different development phases should ideally be implemented,^{37,51} namely idea forming,^{38,51} creating a treatment theory,^{37-38,51} proof of concept⁵¹ and feasibility,³⁷⁻³⁸ evaluating efficacy,^{37-38,51} evaluating effectiveness,^{38,51} health service research⁵¹ and implementation research.³⁷ Skivington et al.³⁸ endorsed the idea that both newly developed interventions and already existing interventions form part of a phased research approach.³⁸ However, interventions are often implemented before a sound scientific basis is established, as was the case with hippotherapy.

Although the phases are described in a linear order that corresponds to pharmaceutical phased research (described by Whyte and Barrett⁵¹ and the first framework used by the MRC), this was not the case with the research on hippotherapy. This non-linear research order can be ascribed to the complex nature of intervention research⁵¹ and Skivington et al.³⁸ emphasised that the non-linear process depends on research needs rather than a specific order. Yet, Skivington et al.³⁸ do mention the possibility that early research can lead to the termination of other research phases, should the intervention prove not to be feasible.³⁸

Skivington et al.³⁸ also listed core elements to be considered within each research phase. These core elements are:

- consider context
- develop, refine and test programme theory
- engage stakeholders
- identify key uncertainties
- refine the intervention
- economic considerations³⁸

The development phases of complex interventions, their application in hippotherapy and where this specific study fits into the scientific development of hippotherapy will be described below.

2.4.2.1 Phase 0: Idea forming

Scientific development

According to Whyte and Barrett⁵¹ Phase 0: Idea forming, starts with an idea inception, often generated by observations, that then lead to the development of treatment theory. Skivington et al.³⁸ did not start with an idea, but started the first phase with the development of an intervention or the identification thereof that included the development of a treatment theory.

In hippotherapy

Observations made on improved body structure and functions during therapeutic horseback riding generated the idea of using the movement of the horse to achieve functional therapy goals that later developed into hippotherapy as a treatment strategy.¹⁶

2.4.2.2 Phase I: Creating a treatment theory

Scientific development

Craig and Petticrew,³⁷ Skivington et al.³⁸ and Whyte and Barrett⁵¹ are in agreement that the treatment or intervention mechanism of an intervention (how change is caused) should be *defined* and a *treatment theory* should be created before further development in research can take place.^{37-38,51} Skivington et al.³⁸ see theory creation as part of intervention development and describe the role of theory as the identification of the components, identification of intervention mechanisms and identification of contexts, and then a description of how all these aspects influence one another. Craig and Petticrew³⁷ and Craig et al.⁵⁰ acknowledged that a theory for complex interventions may be difficult to establish and might be unclear during the early phases, and therefore advocate for pilot studies to test a newly developed theory. Both Craig and Petticrew³⁷ and Skivington et al.³⁸ stated that researchers should understand the intervention process through existing evidence and understanding of the intervention theory. Furthermore, researchers should better their

understanding of an intervention with new primary research, should there be a gap in the theoretical knowledge.³⁷

Safety and dosage are also listed by Whyte and Barrett⁵¹ as part of Phase I: Creating a treatment theory, and are easier to comprehend within pharmaceutical research than in intervention research. Whyte and Barrett⁵¹ argued that safety risks, optimal dosage, cost, feasibility and compliance of the client all play a part in the safety and dosage of an intervention and that it relates to the core elements that must be implemented into each research phase.

In hippotherapy

Although research on “horseback riding for the disabled” (also called “therapeutic horseback riding” or “horseback riding therapy”) and hippotherapy started to develop in the 1980’s,⁹⁷ the two strategies were often studied in combination – leading to uncertainty and incongruence when interpreting the results.^{19,98-99} The first written *definition* of hippotherapy that the researcher could find was published by Heipertz¹⁰⁰ in German in 1977 and translates to English as: “a mainly passive form of therapeutic riding whereby the patient sits on the horse and accommodates himself to the swinging movements of the horse’s back.”¹⁰¹ Since then the definitions for hippotherapy have evolved and Wood and Fields³ listed 75 hippotherapy definitions found in studies done between 1980 and 2018. The common denominator in all these definitions was that the movement of a horse (while the client was mounted) was used and influenced by specified providers, mostly PTs, OTs and SLPs. Other than these common denominators, definitions varied. While some definitions focused on the process while the client is mounted to achieve functional goals, other studies defined hippotherapy as more comprehensive and included groundwork where the physical environment and social interaction with people and animals at the stable yard were part of hippotherapy.³ On the subject of defining hippotherapy Wood and Fields³ concluded: “...hippotherapy was ambiguously defined and differently conceptualized and implemented.” They advise careful defining of hippotherapy (informing on specifics such as a client being mounted or working on the ground or both. Working on the ground in the horse environment might entail activities such as grooming a horse or engaging stable management tasks) within studies to inform on the specific intervention applied to each study.³

Articles on hippotherapy seldom mentioned or expanded on specifics (named components by Skivington et al.)³⁸ of the hippotherapy treatment, but rather focused on the outcomes of studies.³ The listing and reasoning about hippotherapy concepts and components can be found in various countries' hippotherapy course notes (as noted in personal conversations between the researcher and colleagues) that are only available to therapists that attended the specific courses. While searching for information on hippotherapy concepts in systematic reviews, scoping reviews,^{19,99,102-103} or meta-analyses²⁰ on hippotherapy, this information gap was further emphasised. In 2019 Wood and Fields³ mapped outcomes of peer-reviewed studies over a 30-year period, using broad descriptors of research, specific characteristics of hippotherapy and specific characteristics of research in the hippotherapy field. This mapping review of Wood and Fields³ did list, but did not describe, components/elements of hippotherapy such as the changes in the horse's gaits and speeds, positions of the clients on the horse, therapeutic activities and various others.³

Concerning a *treatment theory* for hippotherapy Wood and Fields³ found that empirical validation of different theories developed and expanded over time such as the use of systems theory within occupational therapy studies on hippotherapy. Also, a treatment theory that focuses on the movement of a horse became widely accepted, but is still mostly empirical in nature.³ Other ideas of treatment in the horse environment that were not previously mentioned emerged and were also called hippotherapy, which warrants further investigation.³

Safety was mentioned in the form of pre-cautions in some studies,^{29,104} and focused solely on the safety aspects of hippotherapy in other studies.¹⁰⁵⁻¹⁰⁶ A lack of knowledge of contraindications was mentioned by both parents and OTs as a perceived risk in the study of Léveill   et al.¹⁰⁵ Yet, indications and contra-indications to hippotherapy are covered extensively in the AHA's guidelines¹⁴ (which are available on the internet) and the EATASA² course, although only therapists that did this course have access to the EATASA notes. In the descriptive survey study of Peter et al.,¹⁰⁶ the inherent risks to mounted clients are well managed and low. They reported that on-site first aid was only needed in 0.05% of sessions and off-site first aid care after sessions were needed in only 0.01% of sessions.¹⁰⁶

Dosage (duration of sessions, frequency of sessions and the total number of sessions) are mentioned in most studies (99% of the studies within Wood and Fields mapping review³), but there does not seem to be consensus on the ideal dosage to show achievement of therapy goals.³

Contribution of this specific study

This study contributed to the treatment theory of hippotherapy by *identifying and describing* hippotherapy *concepts*. Therefore, filling the research gap by expanding on hippotherapy concepts not previously identified and describing all the identified concepts. This study filled the research gap in the theoretical knowledge by undertaking a scoping review (Chapter 4).

This study also identified the *intervention mechanisms* by investigating how experienced OTs, PTs and SLPs use these hippotherapy concepts when treating clients with spastic CP (Chapter 5).

Through a consensus process among hippotherapy experts (Chapter 6), hippotherapy is further developed as a complex intervention and these practice guidelines can inform future proof on concept studies and inform therapists on how to apply hippotherapy concepts when treating clients with spastic CP.

The guidelines on *precautions* and *dosage* contribute to this stage of the scientific development of hippotherapy as more specific information regarding precautions and dosages is now available.

2.4.2.3 Phase II: Proof of concept and/or feasibility

Scientific development

In Whyte and Barrett's⁵¹ Phase II, *proof of concept* should be established by seeking some evidence of a positive intervention effect on recovery or function that supports the treatment theory and follows a deductive reasoning process. As this phase does not intend for data to be generalisable to a broad population, small participant numbers are relevant.⁵¹ Although control groups may not be required according to Whyte and Barrett,⁵¹ Craig and Petticrew³⁷ still suggested that randomisation should be considered to prevent selection bias. They both cautioned that the implementation process should be re-evaluated in cases where the

desired effect of the intervention is lacking, as that may be the reason for failure.³⁷ The major purpose of the proof of concept phase is to motivate larger-scale efficacy studies by demonstrating a treatment effect.⁵¹ Both researchers and readers of published studies should note that when randomised control trials are implemented within the proof of concept phase, the purpose is not to demonstrate efficacy or effectiveness.⁵¹

In Skivington et al.'s³⁸ report, *feasibility* studies are the second phase mentioned and are done to inform researchers if and how to progress to the evaluation phase of research development. Such feasibility studies might be needed before efficacy studies (Phase 3, according to Whyte and Barrett)⁵¹ and/or before effectiveness studies (Phase 4, according to Whyte and Barrett⁵¹) to explore uncertainties, optimise future study designs and test the acceptability of the intervention.³⁸ Craig and Petticrew³⁷ said that problems such as acceptability, compliance, delivery of intervention, recruitment and dropping out, all fit within the topics of feasibility studies. According to Craig and Petticrew,³⁷ Phase 2 is the time to implement piloting and thus testing various aspects of the intervention where uncertainties exist. These pilot studies can merely clarify details of implementation or process,³⁷ without having to be associated with larger successive studies.

In hippotherapy

Whyte and Barrett⁵¹ explained that the purpose of studies with small populations and not having control groups is to *prove concept*. Most studies on hippotherapy fall in this category, and therefore within this second phase of scientific development. Hippotherapy articles primarily focused on outcomes^{18-21,102,107} and the proof of concept as described by Whyte and Barrett⁵¹ is mainly (but not exclusively) provided in physical functioning and mobility.³ According to Wood and Fields³ the largest diagnostic representations were participants with CP and studies that described the therapeutic effect in different performance skills¹⁰⁸ such as improved posture,^{20,109} balance,^{20,64,109-111} gross motor development,^{53,57,64,81,110,112-113} walking speed^{29,114} and fine motor skills.⁵³ All but one study mapped by Wood and Fields³ used qualitative outcome measures, and of those, 59 studies used quasi-experimental designs that fit into the proof of concept phase, namely pre-post designs, single-subject designs, various descriptive designs and single case reports.³

Hippotherapy *feasibility* studies were not reported by Wood and Fields,³ but they did observe wide acceptability by stakeholders to incorporate horses into therapy. This researcher only found three studies^{74,115-116} using the word “feasibility” within the title. One focused on adaptive riding and not on hippotherapy.¹¹⁶ One focused on the feasibility of a walk versus a walk-trot protocol in hippotherapy and found that it was indeed feasible to use both walking and trotting⁷⁴ and a 2021 published study found that a mutualised intervention and assessment protocol are both feasible and acceptable to parents and OTs when hippotherapy is used for clients with autism.¹¹⁵

Contribution of this specific study

This study was not a proof of concept or feasibility study but set the scene for better defined future proof of concept and feasibility studies and in due time also for efficacy studies. The guidelines provide themes for future research that will lead researchers to target specifics relating to each concept in their studies.

2.4.2.4 Phase III: Evaluate efficacy

Scientific development

Within the evaluation phase described by Craig and Petticrew,³⁷ and by Skivington et al.,³⁸ there are both efficacy studies and effectiveness studies. In this literature review, efficacy studies and effectiveness studies are described separately, each within its own phase, as Whyte and Barrett⁵¹ did.

According to Whyte and Barrett⁵¹ the purpose and design of efficacy studies are to determine the direct or immediate effect of the intervention on the study outcome such as the effect on balance, posture or mood within a representative population. As Skivington et al.³⁸ put it: “Evidence from an efficacy study indicates whether or not an intervention can work in idealised conditions.” These studies do not intend to investigate the impact on activity participation or even broader body functioning.⁵¹

In early efficacy studies, participants that are more likely to respond to treatment might be selected – for example, clients who are on the waiting list and want to take part in hippotherapy might respond better to hippotherapy than clients randomly selected at a school.³⁷ Consequently, the impact found in efficacy studies might overestimate the impact

that the intervention will have on a broader population.⁵¹ Skivington et al.³⁸ call this an “idealised, controlled condition”. This must be kept in mind and addressed within the next phase of the development. Craig and Petticrew³⁷ emphasise that researchers should take the specific characteristics of the aim of an efficacy study into consideration when choosing a study design, and should not be influenced by convention dictating specific designs for specific interventions.³⁷

In hippotherapy

Wood and Fields³ found 14 quantitative hippotherapy studies within the efficacy phase of scientific development. These studies included comparison conditions, were randomised, and had larger numbers of participants (ranging from 11 to 91^{55,57,64,75-77,83-84,89,91,117-120}). They concluded: “In due time, reputable journals came to publish efficacy research that used randomised controlled designs. Hippotherapy was reported as more efficacious than numerous comparison conditions.”³

2.4.2.5 Phase IV: Evaluate effectiveness

Scientific development

Whyte and Barrett⁵¹ firstly evaluate effectiveness by focusing on the impact of an intervention in clinical practice and the generalisability of the treatment effects. As Skivington et al.³⁸ put it, the “pragmatic questions” are answered through effectiveness studies. Effectiveness studies are needed to determine the success within communities as interventions are undertaken by providers from different experience levels and to clients who are more diverse than small study populations.⁵¹ These studies might help to refine the client population who can optimally benefit from an intervention or the kind of training that a provider needs to reach the same results as in efficacy studies.

Secondly, effectiveness studies focus on the impact of an intervention in clinical practice on activity and participation outcomes,⁵¹ thus answering the question: Did the intervention have an impact on meaningful function?⁵¹ Without effectiveness studies the prediction of the benefit of evidence will be lacking.⁵¹

In hippotherapy

Wood and Fields³ did not find any effectiveness studies done in hippotherapy, and neither did this researcher. In the light of the efficacy studies done by PTs or where PTs were the service providers, PT-hippotherapy-related research might be ready to move onto effectiveness studies. OTs and SLPs on the other hand did not reach this point yet.³

2.4.2.6 Phase V: Health services research and implementation research

Scientific development

Whyte and Barrett⁵¹ did not list a corresponding pharmaceutical phase to health services research, as he sees this phase as exclusive to interventions that focus on rehabilitation. According to Whyte and Barrett,⁵¹ health services research is the most advanced phase in intervention research and is still developing. This research should investigate patterns of practice within the community that focus on the availability, quality or cost of the intervention.⁵¹ Craig and Petticrew³⁷ on the other hand focused on dissemination, surveillance and monitoring and long-term follow-up within the implementation phase and state research in this phase to be uncommon but highly informative such as studies on intervention fidelity.³⁷

In hippotherapy

As hippotherapy is still in the earlier developmental phases of research, no implementation research was done (that the researcher knows of) on the availability of hippotherapy in any context, the quality of the intervention or the costs involved. Yet, it is important to consider such research in the future as hippotherapy is already implemented in many countries.^{3,16}

2.4.3 Conclusion on hippotherapy

Scientific development of complex interventions such as hippotherapy requires a phased approach over time.^{3,50} Thus far there was a strong focus on hippotherapy outcome studies, neglecting basic defining of concepts and the formulation of theory.³ Piloting work, careful consideration of practical issues in hippotherapy and more feasibility studies, as suggested by Craig and Petticrew,⁵⁰ will ease the evaluation of hippotherapy as an intervention and set the scene for further research within all the phases of development of a complex

intervention.^{3,38} Furthermore, Wood and Fields³ argued that studies across all the professions involved in hippotherapy are needed. They also plead for a more systematically phased approach within hippotherapy research to cover all the research phases. This literature review also indicated that there is a need for more feasibility studies within the field of hippotherapy, especially regarding cost and accessibility within various contexts across the world.

With the scientific development in hippotherapy thus far, in mind, this study aimed to develop practice guidelines that will inform OTs, PTs and SLPs (in a transdisciplinary manner) on the use of various concepts within hippotherapy when treating clients with spastic CP. These guidelines fit into the “creating a treatment theory” (the second phase) of scientific development of hippotherapy.

2.5 GUIDELINES

This part of the literature review will focus on the purpose of guidelines, available hippotherapy guidelines and on guideline development.

Various publications give guidance on how to develop guidelines and were found using the keywords “guideline development” and “practice guidelines” in Google Scholar. The literature used in this study includes the “Handbook of guideline development” from the WHO,¹¹ “A guideline developer’s handbook” from the Scottish Intercollegiate Guidelines Network (SIGN)¹² and a practice guideline development manual from Rosenfeld et al.¹³

The purpose of practice guidelines is to help the user (in this study OTs, PTs and SLPs) with decision-making regarding the treatment of a client,¹¹⁻¹³ but never to replace the professional or clinical reasoning of the therapist.¹³⁻¹⁴ Rosenfeld et al.¹³ said that “guidelines simply represent the best judgement of a team of experienced clinicians and methodologists addressing the scientific evidence for a particular topic”.¹³ They describe the role of well-developed practice guidelines as “initiate quality improvement efforts, prioritise new research initiatives, and support coverage or reimbursement for appropriate services”. They emphasised the benefit that guidelines bring to the clients through “better outcomes, fewer ineffective interventions and greater consistency of care”.¹³

Equally important as to understanding what guidelines are, is a clear appreciation of what guidelines are not.¹³ According to Rosenfeld, Shiffman and Robertson¹³ guidelines are not:

- “reimbursement policies”
- “performance measures”
- “legal precedents”
- “measures of certification or licensing”
- “for provider selection or public reporting”
- “recipes for cookbook therapy”

Although guidelines can be seen as information given by experts about treatment, it is essential for this study to understand what guidelines already exist and the guideline development process described by various guideline developers.

2.5.1 Existing hippotherapy guidelines

The only hippotherapy guidelines known to the researcher were developed by the American Hippotherapy Association (AHA).¹⁴ The AHA states that their guidelines aim to support therapists in treating clients through hippotherapy¹⁴ and are, therefore, in line with the consensual purpose of guidelines mentioned by all the authors used in this section.^{11-13,121} These practice guidelines firstly focus on the team involved in providing hippotherapy and emphasise the recommended knowledge, training and experience of the treating therapist, as well as the role of the therapist within the team.¹⁴ Secondly, these practice guidelines focus on the professionalism of the team and thirdly, on safety within the American context.¹⁴ The last part of the document focuses on precautions and contra-indications when hippotherapy is considered as a treatment strategy for a client.¹⁴

Each aspect mentioned in the AHA hippotherapy practice guidelines is important, but it does not mention specific actions within hippotherapy treatment to ensure greater consistency of care within any specific diagnostic group as mentioned by Rosenfeld et al.¹³ and this need for more specific practice guidelines necessitates this study and a further discussion on the development of guidelines.

2.5.2 Guideline development

In 2013, Rosenfeld et al.¹³ described the logical sequence of key actions in a pragmatic and rigorous guideline development strategy followed by the American Academy of Otolaryngology- Head and Neck Surgery. The five steps advised by Rosenfeld et al.¹³ supplemented with the descriptions from WHO¹¹ and SIGN¹² formed the basis for the guideline development of this study. However, the specific methodology for this study is presented in Chapter 3.

These five steps, developed by Shekelle et al.,¹²² and recommended by Rosenfeld et al.¹³ provide a systematic approach to guideline development and were needed due to wide variability in guideline methodology.¹³

Both SIGN¹² and WHO¹¹ state that practice guidelines should review scientific evidence and reasoning behind recommendations before describing them. They encourage the evaluation of guideline development to ensure guideline quality¹³ and to ensure that the methodology aligns with international standards.

2.5.2.1 The planning phase: Identifying and refining the subject area

The WHO¹¹ places emphasis on the planning phase, as that has a profound impact on all aspects of the final product. They encourage researchers and guideline developers to seriously consider if a guideline is really needed, who wants it and why it is wanted now.¹¹ They then go on to describe the practical planning and scoping of the guideline. Scoping the guideline is the process of setting the boundaries of the guideline to decide what should be included and what should be excluded.¹¹

During the practical planning phase, they took 10 aspects into consideration, namely guideline dissemination, target audience, timelines, budget, necessary resources and skills, impact evaluation, external partners, type of product, peer review and translation.¹¹ In contrast, SIGN¹² focuses on how a topic is selected for guideline development and how to decide when and if already existing guidelines need updating.

The WHO¹¹ spends a separate chapter (indicating the importance thereof) on formulating questions and choice of outcomes for the guidelines. As the questions influence the final recommendation the importance of this part of the process should not be underestimated.

The WHO¹¹ recommend that “PICO” questions should be formulated where P stands for population, I for intervention, C for comparator and O for outcome.¹¹

Both the WHO¹¹ and Rosenfeld et al.¹³ suggest the setup of a steering group during this planning phase, as one of many groups involved during their guideline development process. Rosenfeld et al.¹³ argue that: “Diversity of expertise and perspective helps minimize bias caused by conflicts of interests” supporting the involvement of numerous people.

2.5.2.2 Convening and running guideline development groups

The WHO¹¹ uses various working groups and teams when developing new guidelines, with the purpose of clear, transparent and reproducible development.¹¹ These groups are the steering group, the external review group, the guideline development group and a systematic review team. All of these groups play an important role in guideline development.¹³

The WHO¹¹ advises the guideline development group size of 10 to 20 members, whereas Rosenfeld et al.¹³ advise a group size of between 15 to 20 members. According to Rosenfeld et al.,¹³ the composition of a guideline development group and their roles are significant to guideline development. The various titles and responsibilities of these members are described in detail in the guidelines of both WHO¹¹ and SIGN.¹² They both encourage multidisciplinary team members, as such a team should be able to foresee practical implementation difficulties.¹¹⁻¹² Other than multidisciplinary involvement, SIGN¹² also advocates that working groups must have members with experience in relevant current practice, display a range of skills and must be geographically representative of the different places the guidelines are intended for.¹² The role of this team is to identify and evaluate all relevant evidence and build support among the intended guideline users.¹¹

One of the tasks to develop guidelines, described by both WHO¹¹ and Rosenfeld et al.¹³ (mentioned outside the five steps used by Rosenfeld et al.¹³), was the disclosure or declaration of conflict of interest. Rosenfeld et al.¹³ included this in several of the other steps, whereas WHO¹¹ dedicated a separate chapter to disclosure. Rosenfeld et al. commented: “Despite good intentions, it is not appropriate for individuals to self-judge if a particular relationship causes conflict; their role is to declare, not to interpret.”

2.5.2.3 Assessing evidence identified by systematic literature review

The goal of this phase is to identify the best possible evidence, then to use the evidence to answer clinical questions and highlight the gaps in the evidence.¹³ Rosenfeld et al.¹³ and WHO¹¹ are of the opinion that unbiased systematic literature reviews ensure validity for evidence-based guidelines and should start off with a planning proposal. Such a proposal will not only ensure the validity of the systematic reviews, but also produce high-quality credible guidelines. The WHO¹¹ further states that systematic reviews are the best way to improve reliability and accuracy as they lessen the risk of selective citation. The SIGN¹² process performs a systematic review for each key question within the proposed guidelines and WHO again suggests “PICO” questions are formulated specifically for the scoping review.¹¹

Rosenfeld et al.¹³ cautioned that research evidence should not be viewed as the primary quality insurance of guidelines but rather as one of several factors that translate evidence into practice. Gaps in literature might be supplemented through a consensus-building process where experts in the field are involved.¹³

To rate the quality of evidence found in the systematic review during the WHO¹¹ process, the evidence is presented to the guideline development group. When a high level of homogeneity of effect measures across studies is present, a meta-analysis can be used to combine the data. Otherwise, a narrative synthesis with very specific methods can be used.¹¹ The WHO¹¹ applies the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) system (among others) to evidence to categorise the quality of the evidence.

2.5.2.4 Translating evidence into recommendations

In this phase, recommendations are made based on the evidence found through the systematic review.¹²⁻¹³ SIGN¹² allows opinions from the development group during this phase and Rosenfeld et al.¹³ state that: “evidence gains context and meaning...” from experts. The WHO¹¹ stresses the balance between risk and benefit to clients when recommendations are formulated. All the guideline development literature used by this researcher recommended a transparent, well-defined process for the development of the

recommendations.¹²⁻¹³ This is a lengthy process that varies between different guidelines, depending on the primary goal of such guidelines. The specific process followed in this study will be discussed in Chapter 3.

The strength of recommendations is often rated within guidelines, but the reader should note that there is a difference between the quality of the evidence and the strength of the recommendation.¹³ Transparent methodology is advised when reflecting on the strength of a recommendation.^{11,13}

2.5.2.5 Subjecting the guideline to external review: Consensus process

Rosenfeld et al.¹³ commenced their recommendations on the external review process by saying: “Independent, external peer review of a guideline is a critical aspect of development”. They stated and then described the three main guideline attributes, namely validity, reliability and feasibility, before recommending that draft guidelines be distributed to external peer reviewers for comment.¹³ After comments from the official external review are addressed, the guidelines are posted on the Academy’s website for a period of two weeks.¹³ Comments from interested groups and the broader public are then received and considered, and the guidelines are updated accordingly.¹³

The WHO¹¹ incorporated peer review in most phases of guideline development namely the drafting of guideline questions, the systematic review, the evidence profiles and the final guideline.¹¹

SIGNS¹² pursues comments on the guideline draft from both the health and the social care community through open consultation, a national open meeting and peer review. After the guideline development group revises the guidelines in accordance with the feedback, a consultation report is formulated before the guidelines are published.¹²

2.5.3 Conclusion on guideline development

Although many different strategies exist for guideline development, the three documents used in this literature review agree on the core stages of guideline development.

They also agree that a transparent phased approach should be applied with as much diverse multidisciplinary involvement as possible. Other common key aspects to be noted are

identifying clinical questions or problems, systemically reviewing and appraising the literature, a process of drafting recommendations, external consultation, reviewing evidence, expert consensus and peer review.

2.6 SUMMARY

The literature behind the development of transdisciplinary hippotherapy practice guidelines for clients with spastic CP was described in this chapter.

The guidelines were developed with clients with spastic CP in mind, which is the most prevalent childhood disability. Therapists are familiar with the condition and information is readily available. Therefore, this chapter mostly concentrated on describing the classifications of CP used for this study as the clients in each classification group need guidelines that are specific to their unique needs. A topographical classification that describes the body parts that are affected was chosen in combination with the GMFCS. Although the GMFCS is a functional classification, it also gives an indication of severity.

By focusing on hippotherapy concepts that transcend the boundaries of any one profession, the hippotherapy practice guidelines are transdisciplinary in nature. Although this study puts an emphasis on hippotherapy concepts and the use thereof by OTs, PTs and SLPs, how a transdisciplinary approach, in general, can benefit clients was also described.

The status of the scientific development of hippotherapy as an intervention was explained by firstly identifying hippotherapy as a complex intervention. Thereafter the phases of developing complex interventions were described and linked to the hippotherapy research done or lacking in each phase. As the scientific development of a complex intervention is non-linear, gaps in the early phases of hippotherapy research exist.

This study was positioned in the second phase of scientific development as the concepts needed for the description of the treatment mechanism of hippotherapy were identified and described. Guidelines on the use of these concepts were then developed adding to the understanding of the treatment mechanism and hippotherapy theory. By filling these research gaps in the early phases of development, the foundation is laid for further development in other development phases.

Lastly, guidelines were described regarding the purpose of guidelines, already existing hippotherapy guidelines and the process of guideline development. By understanding the stages of guideline development and what that entails, the scene is set for describing the methodology in Chapter 3.

CHAPTER 3

OVERARCHING METHODOLOGY OF THE STUDY

3.1 INTRODUCTION

This chapter starts with a description of the researcher's positionality (including her philosophical stance) because positionality influences all the other spheres of the research. This chapter then provides an overview of the overarching methodology used to develop hippotherapy practice guidelines, but the details of the methodology used within each phase of the study will be discussed in separate chapters. The overarching study context, research design, conceptual framework of the study, ethical considerations and rigour will each be discussed.

It is important to keep in mind that the aim of this study was the development of transdisciplinary hippotherapy practice guidelines and the role of guidelines is to translate best evidence into best practice to promote the quality and effectiveness of hippotherapy.¹³ It is also important to note that because research on hippotherapy is still in the early stages of scientific development, measures to supplement research gaps were needed throughout the guideline development process.^{3,51}

3.2 POSITIONALITY

Part of the researcher's positionality that led to the research topic was described in the background section (Chapter 1) of this thesis. In this chapter, she describes the philosophical perspectives applicable to the study before delving deeper into her known biases and how she mitigated them with regard to the participants of the study, her personality and the research context. As positionality must be recognised and acknowledged throughout a study,¹²³ the details of the researcher's positionality during each phase of the study are discussed in further detail in applicable chapters.

3.2.1 Philosophical perspectives

In this study, the outcome-oriented¹²⁴ real-world¹²⁵ approach of pragmatism was followed. Not only did this approach give the researcher freedom in the choice of methods,¹²⁵⁻¹²⁶ but

she also agrees with the philosophical stance¹²⁷ that the value of research lies in problem-solving.¹²⁶

3.2.2 Ontology

In pragmatism, truth is not absolute, but manifest in useful, concrete consequences of reality and can change because reality changes.¹²⁵ The researcher's own position of power (being the researcher) within the research undoubtedly influenced her analytical and observational lens, but she mitigated her position by including all the feedback and comments from participants into the various phases of the study and by leaving an audit trail of this process.^{123,128}

This study relied on the beliefs¹²⁷ of therapists about hippotherapy treatment of clients with spastic CP. The researcher is convinced that the beliefs of the therapists are closely related to their actions that are influenced by their experience¹²⁷ in hippotherapy as well as their social interaction with fellow therapists and clients.^{125,129} Experience is both constrained by the nature of the world and by our interpretation of the world¹²⁷ and, therefore, therapists from different countries and professions were included in this study to give a broader, in-depth perspective that spans across more than one context.

3.2.3 Epistemology

How we fashion knowledge is influenced by one's own life experiences.¹²³ According to Dewey's pragmatic philosophy, knowledge can be generated through enquiry that leads to action and action leads to beliefs.¹²⁷ The "known" cannot be separated from the "knower", and therefore, the researcher cannot be separated from the research or the outcome thereof.¹²⁷ When this researcher started debating on what is knowable within hippotherapy she shifted from a supposed un-biased stance to the conviction that the researcher is not objective.¹³⁰ I also shifted the writing of this sentence to the first person as I cannot deny my own experience, opinions and knowledge within the field of hippotherapy, as described in Chapter 1 of this thesis.

The beliefs of therapists that were generated through their experiences in hippotherapy led through enquiry¹²⁷ to the generation of transdisciplinary hippotherapy practice guidelines. During therapy, therapists' beliefs influence their hippotherapy interventions, and the

outcomes of the interventions create experiences that in return influence beliefs.¹²⁷ To understand a therapist's experience, which is emotionally and socially influenced,¹²⁵ one must enquire where a belief with regard to hippotherapy comes from, and what their hippotherapy intervention (actions) means by questioning their professional reasoning.¹²⁷

The possibility exists that the experience of one therapist or a group of therapists in one country or profession might influence hippotherapy intervention in a totally different manner than in another country or profession.¹²⁷ These differences should be noted as valuable contributions through their diversity. On the other hand, similarities in hippotherapy intervention across countries and professions (despite the differences in the social reality of the therapists), led to guidelines that are more transferable to other hippotherapy contexts as well.

3.2.4 Methodological assumptions

A structured, yet flexible, methodology is suitable when little is known about a topic.¹²⁶ The methodology chosen is also influenced by the personal belief of the researcher¹²³ that there is power in the collective knowledge of therapists using hippotherapy around the world. The research problem of this study stated that no transdisciplinary hippotherapy practice guidelines existed. Therefore, a practical answer¹²⁴ was reached through different¹²⁶ scientific,¹²⁹ qualitative enquiries.^{126-127,129} A wide range of therapists^{124,127} were included, with the intention to uncover firstly the therapists' perspectives,¹²⁶ associated meanings and their subjective views¹²⁶ on the decisions inherent to the hippotherapy treatment of clients with spastic CP. Secondly, it also addresses the researcher's personal wish that this approach will help the hippotherapy research community to evolve.¹²³

This study, therefore, used a qualitative approach to inquiry,¹²⁶ from a theoretical phase to a qualitative guideline development to consensus building. The data analysis was inductive¹²⁶ and resulted in clear transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

3.2.5 Position in relation to participants (therapists)

Different OTs, PTs and SLPs participated in both phases 2 and 3 of the study and can be regarded as a guideline development group and an expert panel. According to Holmes,¹³¹ it

is important that a researcher positions him/herself in relation to the participants and take an outsider or insider stance, but this researcher had a dual stance and consequently embraced more than one truth at the same time, as described by Secules et al.¹²³ The researcher's inside perspective stems from her being an OT that uses hippotherapy as a treatment tool and her wanting to participate in the scientific development of hippotherapy, as was also the case with the participants in both phases. This insider perspective brought the researcher's contextual understandings about hippotherapy that someone with an outsider perspective might not have but could also lead to the therapist interpreting descriptions from the participants through her own hippotherapy lens instead of objectively understanding the true meaning intended by the participants. To mitigate this possible bias and obtain a broader perspective, a SLP (also using hippotherapy as a treatment tool and in that sense having an insider perspective herself) read through all the comments from the participants and discussed the thematic analysis with the researcher. Where there was disagreement, the researcher then had a meeting with both her supervisor and co-supervisor (who do not use hippotherapy but are both OTs – again a dual perspective) to gain more possible insights. Another dual perspective stems from the fact that English is not the researcher's first language, as was the case with many of the participating therapists and the use and interpretation of the language could vary due to cultural influences.

The researcher's outside perspective stems from not being a PT or SLP and being from another country (and cultural background) than most of the participants. Various cultural differences became apparent during the research, especially regarding language. Language is constructed by humans in a social environment and, as such, is culturally influenced.^{123,131} To name but one example: a language difference became apparent when a therapist from the United Kingdom remarked that the term "spastic CP" is seen as derogatory, while no other therapist remarked on the term. As the title of the study was already registered, the researcher countered the possibly offensive term by defining the term as "heightened tone" during the information interviews with the expert panel and was met with surprise by some therapists from other countries for clarifying the term.

Furthermore, the researcher was acutely aware of her position of power as researcher and the responsibility that comes with such power. This position of power stems from her

purposively selecting the expert panel, and her developing the inclusion and exclusion criteria. Knowing that no matter how much effort is put into staying objective, some bias or subjectivity will always be present in any situation¹³¹ led to it partly being mitigated with an audit trail throughout the study. The audit trail was intended to keep a record of the researcher's reasoning in the selection process or any other decision-making, in a transparent manner.

3.2.6 Identity, personality and beliefs of the researcher

As stated by Secules, et al.,¹²³ "Identity informs our research in ways that are deeper and more complex than simple disclosures imply". This researcher intends to disclose some of her motivations and beliefs behind this study in the hope that it will enrich the understanding of these guidelines.¹²³ This researcher was brought up to believe that one cannot complain or even comment on any state of affairs if one is not willing to put the effort in to contribute, affect or change the affair. Therefore, when she became aware of the need for guidelines, she was willing to embark on the journey of "getting it done" but also acknowledged that she was a novice guideline developer in need of advice and structure, hence the meticulous planning of each phase of the study under solicited academic supervision.

Although the researcher is often told that her passion for hippotherapy is contagious, she did not wish to influence study participants unintentionally or intentionally into participation. Therefore, she only communicated with prospective participants through formally written emails in Phase 2 of the study. All of these emails are available in the audit trail of the study.

During the third phase of the study, the expert panel was selected and invited to take part in the study via email. Only after they accepted the invitation to take part, a Zoom meeting was scheduled with each member of the panel. The purpose of the meeting was to explain the study and what was expected of each member. She openly stated her position within hippotherapy and within the research and that she sees the expert panel as having the power to influence the process.

3.2.7 Research context

An important contextual aspect to remember is that this study focused on the physical use of various concepts in hippotherapy and not on the emotional experiences (although

emotions might influence decisions) of therapists or clients. The researcher acknowledges that more abstract concepts, such as the horse's temperament, are influenced by the personal points of view of individual therapists. Whereas concepts such as the height of the horse in relation to the height of the therapist were measurable and thus less open to interpretation. This awareness of how each therapist's personal positionality might influence the research made the researcher more diligent in the inclusion of as many participants' view-points as possible before presenting it to the expert panel, and then again to include all the expert panel's comments in following consensus rounds.

3.3 OVERARCHING METHODOLOGY

As described below, in the conceptual framework of the study (Section 3.3.3), the study was done in three phases. The methodology of each phase is described in a separate chapter, while this chapter gives the reader an overarching view of the study.

Phase 1 a theoretical enquiry was done through a scoping review to identify and describe the hippotherapy concepts mentioned in 51 documents. The result, 19 hippotherapy concepts, was then used in Phase 2 of the study.

Phase 2 enquired how these concepts were used by OTs, PTs and SLPs in different countries when doing hippotherapy. The result of Phase 2 was 213 guideline statements, constructed from the answers of therapists given in a questionnaire.

In Phase 3 of the study, these guideline statements were then presented to an expert panel who decided on the exclusion or inclusion of the statements into the final transdisciplinary hippotherapy practice guidelines. The expert panel also contributed to the formulation of new guideline statements that were also subjected to the consensus process. When a guideline statement reached consensus to be included in the final guidelines, the wording changed from being called a "statement" to being called a "guideline".

3.3.1 Study context

The context of each phase of the study will become clearer within the methodology section of Chapters 4, 5 and 6. However, a total of 51 scoping documents were included. Nine OTs, nine PTs and three SLPs, from eight different countries, took part in the study. The countries

were: Belgium, Canada, the Czech Republic, Denmark, Peru, South Africa, the United Kingdom and the United States of America.

Phase 1 – a scoping review was done from 25 November 2019 to July 2020.

Phase 2 – two qualitative questionnaires were completed by 11 therapists from 16 September 2020 to 15 December 2020

Phase 3 – modified Delphi Technique was done from 3 August 2021 to March 2022 with the participation of 11 expert panel members.

3.3.2 Research design

A qualitative, exploratory, descriptive, contextual research design was used to gain an understanding of real-life hippotherapy to develop transdisciplinary hippotherapy practice guidelines.

Qualitative research intent to explain phenomena within a specific context.¹³² Exploratory research is conducted to broaden the knowledge base with new insights and ideas¹³³ and descriptive research involve objective, direct exploration, analysis.¹³⁴

In this *qualitative* research, the intent was to generate an explanation¹³² of the use of hippotherapy concepts shaped by the views of therapists from three different professions and from different countries.¹³⁴ The researcher *explored*¹³⁵ concepts both in theory and practice before requesting therapists to *describe* the application of these concepts.^{132,134} The exploration was needed to broaden the knowledge base of hippotherapy by identifying and describing concepts that were not verified yet.¹³⁵ Therapists' views then directed the compilation of guidelines about the use of hippotherapy concepts when treating clients with different classifications in the spastic CP population.

This study recognise that knowledge is generated within certain contexts and incorporated these contexts into the analysis process¹³² to obtain a transdisciplinary perspective of the different hippotherapy practices across the world.¹³⁴

The following elements of enquiry and research approach¹³⁶ were used in this study:

Research approach: Qualitative.

Knowledge claim: Pragmatic assumptions.

Strategy of inquiry: Case study where each sub classification of clients with spastic CP was seen as separate client.

Methods: Scoping review, qualitative questionnaire and modified Delphi technique.

3.3.3 Conceptual framework

The purpose of a conceptual framework is to analyse concepts and their interaction with one another and to guide the research methodology by taking existing theories into consideration.

The first framework concept in this study that will be discussed is “guideline development process”. The *output* of this study is transdisciplinary hippotherapy practice guidelines for clients with spastic CP and is “the problem to be solved” from the researcher’s pragmatic philosophical point of view. This output led the researcher to the development of a combined operational framework for guideline development. She combined the processes of the WHO,¹¹ SIGN,¹² and Rosenfeld et al.,¹³ as illustrated in Figure 3.1. This operational framework is the *process* in the conceptual framework that incorporated the experience of therapists to substitute the lack of evidence during these early phases of scientific development of hippotherapy, and therefore, solved the “how to?” questions of the study. According to the WHO,¹¹ the guideline development process should be clear and transparent to allow the user to know how, why, by whom and on what basis the guidelines were developed.

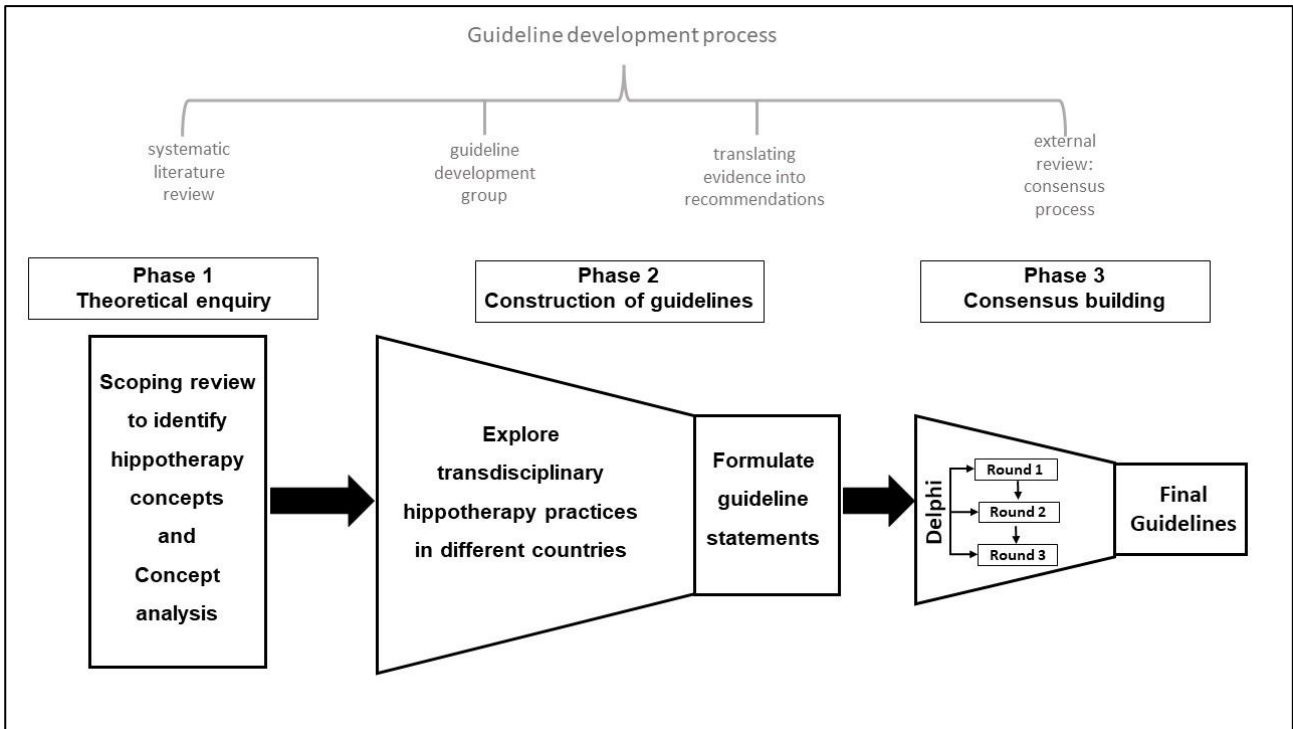


Figure 3.1 Operational framework

The second framework concept was the “structure of the guidelines” and is called the “true nature of hippotherapy” by Wood and Fields³ and termed “hippotherapy concepts” by this researcher. As hippotherapy concepts were not previously identified, the first phase of the study focused on exploring and describing hippotherapy concepts to enable the next phase of the study to take place and answer the “what is hippotherapy about?” question.

The third framework concept in the study was the “information” needed and thus the *input* of the study. Information was gathered from published literature, grey literature and experienced OTs, PTs and SLPs.

As the aim of the study was guideline development, the focus was on the process and as such the researcher used an input – process – output model as depicted in Figure 3.2 to illustrate the conceptual framework of this study. Each phase of the study (described in the operational framework described above and illustrated in the process block), had its own input, process and output. The output of Phase 1 became the input to Phase 2 and the output of Phase 2 was then the input to Phase 3. Therefore, all the phases followed one another to bring the guidelines about.

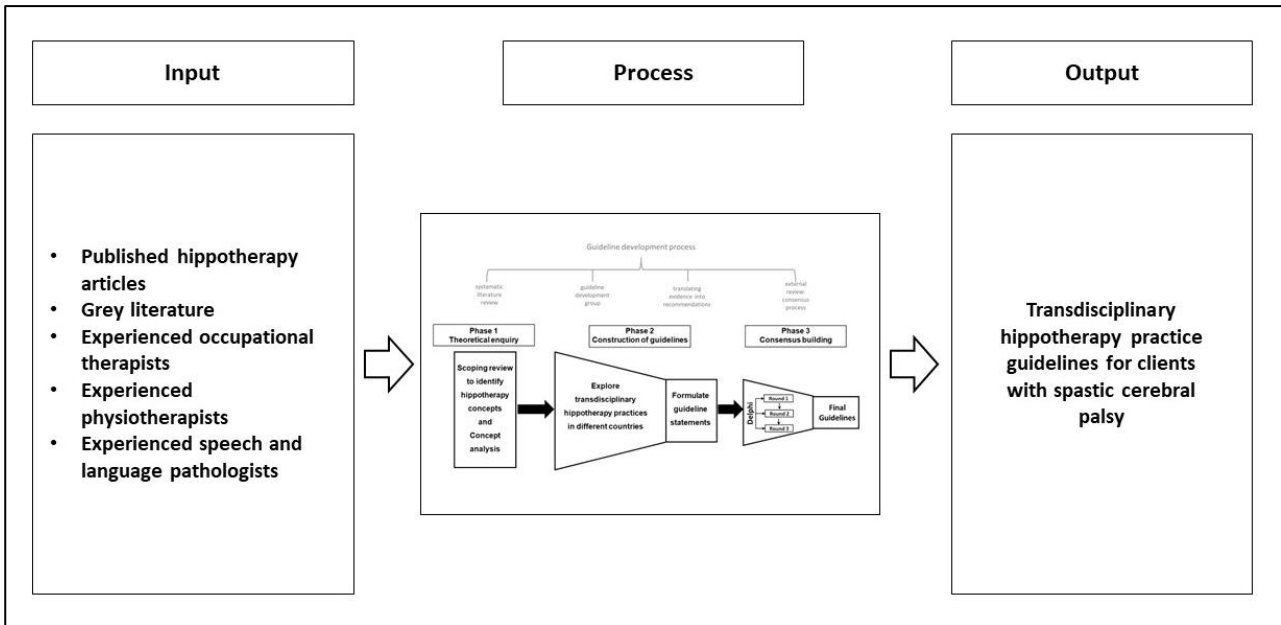


Figure 3.2 Conceptual framework model

3.4 ETHICAL CONSIDERATIONS

3.4.1 General ethical considerations

Ethics are concerned with the responsible conduct of research and one aspect thereof is ethical approval.¹³² For this study ethical approval was obtained from the Faculty of Health Sciences Research Ethics Committee of the University of Pretoria, ethics reference number: 774/2019 (Annexure A).

Phase 1 of this study did not involve human participants and the ethical obligation of the researcher was to ensure the trustworthiness of the scoping review (Chapter 4). Phases 2 (Chapter 5) and 3 (Chapter 6) of the study involved therapist-participants and the ethical considerations are discussed below.

3.4.2 Protection from harm

As this study involved experienced therapists giving written information about their field of expertise (hippotherapy), the risks of taking part in this study were negligible in both Phases 2 and 3 of the study. Other than the process being time-consuming, no physical or psychological risk or discomfort was expected or reported by any of the therapist-participants.¹³⁷

3.4.3 Autonomy

Autonomy is the ability to make an informed, un-coerced decision and be treated with respect.^{132,137}

During Phase 2 of this study possible participants, that fulfilled the inclusion criteria described in Chapter 5, received a written information email (Annexure B). The participants received a link to the Qualtrics (the survey programme used) questionnaire in this email. Clicking on the link was entirely voluntary in the privacy of their own home or office. In Qualtrics they had to give consent (Annexure B) before the first question was displayed. When a possible participant decided not to give consent the programme displayed a thank you note and terminated the session.

During Phase 3 of this study, possible participants (Chapter 6) were informed via email and invited to serve on the expert panel (Annexure C). If they did not respond a follow-up email was sent two weeks after the first invitation and in case of no response, once more in a month's time. If no response was received after the third email or if the possible participant indicated that he/she did not want to take part in the study, another possible participant on the list was contacted for more detail on the selection of participants. Possible participants became expert panel members once they accepted the invitation and a personal Zoom meeting between the expert panel member and the researcher was then scheduled. In the Zoom meeting, information about the study was given to the expert panel member and the modified Delphi technique was explained (Annexure D). After the Zoom meeting, the expert panel member received a link via email to take part in the first modified Delphi round. Informed consent (Annexure E) to take part was needed before each Delphi round and the programme was unable to continue for the expert panel member if he/she did not consent.

During the interview, the expert panel members were informed that they may withdraw from the study at any point without any consequences.¹³² They were also encouraged to email or WhatsApp the researcher should they encounter any difficulties accessing the Qualtrics programme or have a question. Technical problems that occurred in the case of two participants and questions from expert panel members and answers from the researcher were logged in the audit trail documents.

3.4.4 Confidentiality

The researcher is aware of who the therapist-participants in Phase 2 and the expert panel members in Phase 3 are. But to keep their responses confidential, each of these participants received a participant number and the supervisor, co-supervisor and SLP that assisted in the analysis process only saw their number, not knowing their name, country, profession or sex. These participation numbers are also used in the audit trail and research notes.

The names of the expert panel members, that gave written consent, will be mentioned in the thesis and any publications, but their names will not be linked to the comments they made within the study.

The data (audit trail, completed questionnaires and the three modified Delphi rounds) will be kept securely on a memory stick at the University of Pretoria, Department of Occupational Therapy, for 15 years.

3.4.5 Compensation

To acknowledge the therapist-participants each participant of Phase 2 received a certificate of participation indicating the details of participation that can be seen as a continuing professional development (CPD) activity (Annexure F). The researcher typed the names of each therapist-participant onto the certificates, yet again none of the people involved in the study saw any of the names of the participants and it is the prerequisite for the participants to make their participation known should they wish to.

To acknowledge expert panel members that participated, they also received a certificate of participation after each Delphi round (Annexure G). They also had the opportunity to indicate in writing if they want to be listed as part of the expert panel within the final version of the transdisciplinary hippotherapy practice guidelines, but their opinions within the study process will forever be quasi-anonymous (only known to the researcher) (Annexure H).

3.4.6 Publishing

To extend the boundaries of science, making the results known is an ethical obligation. Therefore, the results of Phase 1 were presented at the European Conference on Equine Facilitated Therapy in 2021 held in Prague. The researcher presented an online

presentation. How the scoping review was done was presented at Equine Facilitated Occupational Therapy Congress in the United Kingdom in November 2021. Articles will also be submitted to academic journals for publication.

Phase 2 of the study was presented to the Association of Chartered Physiotherapists in Equine Activities in the United Kingdom in 2022. This phase was also presented in a lighting presentation and on poster at the congress of the World Federation of Occupational Therapy in 2022.

Phase 3 of the study and the transdisciplinary guidelines for hippotherapy will be published and presented widely.

3.5 RIGOUR

Rigour refers to the quality of the research process and findings and is defined as “being careful and paying great attention to detail”.¹³⁸ Cypress¹³⁹ and Amankwaa¹²⁸ argue that qualitative research is worthless without rigour and that rigorous standards are important to evaluate qualitative research results.¹³⁹ However, in qualitative research, rigour is more often termed “trustworthiness”, which is defined as something “that you can rely on to be good, honest, sincere”.¹³⁸ “Trustworthiness” will be the term used to describe the rigour applied to this study, and was already used by Guba and Lincoln who in 1981¹⁴⁰ described it as the “truth value”, “applicability”, “consistency” and “neutrality” of the data, analysis and interpretation. To ensure that the guidelines and the research process were trustworthy the researcher paid careful attention to detail of every step of guideline development in an honest and sincere way and will describe the steps in the next chapters.

The overarching considerations for trustworthiness over the entire study are credibility, transferability, dependability and conformability, and are further discussed below. The trustworthiness of each phase of this study will be discussed in more detail in the applicable chapters according to the same trustworthiness criteria.

3.5.1 Credibility

Credibility were also described in by Lincoln and Guba¹⁴¹ in a later publication and refers to confidence in the truth of the data and the interpretation of the data, in other words, the

quality and integrity of the study. In this study, the following techniques were identified and used to establish credibility:

- Prolonged engagement of the researcher (a four year engagement).¹⁴¹
- Peer debriefing (Supervisor, co-supervisor, SLP commissioned for this role).^{128,141}
- Negative case analysis (discussed with the supervisor and co-supervisor).¹⁴¹
- Member-checking (the expert panel in Phase 3 fulfilled this role through the modified Delphi technique besides the primary objective of consensus building).^{128,141}

3.5.2 Transferability

Transferability refers to the extent to which findings are applicable to other settings or groups.¹⁴¹ In this study, transferability was established by:

- Including therapist-participants from different countries and professions whose experience spans over more than one context.
- Thick description (describing participant comments in sufficient detail for the reader to evaluate the conclusions of the researcher).¹⁴¹
- Worksheets depicting the development of the guideline statements from the answers in the qualitative questionnaires.
- Worksheets depicting all the comments from the expert panel and how that influenced the wording and further development of the guidelines.

3.5.3 Dependability

Dependability refers to the stability and consistency of data and conditions over time (able to be repeated).¹⁴¹ In this study dependability was established as follows:

- The study protocol that was developed already established all the considerations for trustworthiness prior to the study.¹²⁸
- An audit trail was created throughout the study.¹²⁸

3.5.4 Conformability

Conformability refers to a degree of neutrality or the extent to which the findings of a study are shaped by the researcher and not the researcher's bias, motivation or interest.¹⁴¹ In this study, conformability was established as follows:

- An audit trail of documents that reflects how each comment from participants was incorporated into the guideline statements.¹²⁸
- Analyst triangulation (use multiple analysts – expert panel and the independent SLP).
- Reflexivity (by stating the researcher’s positionality within every phase of the study and at the beginning of this chapter).¹⁴¹

3.6 SUMMARY

This chapter provided an overarching description of the methodology used to achieve the aim of this study namely the development of transdisciplinary hippotherapy practice guidelines for clients with spastic CP. To achieve this aim, the researcher took a pragmatic philosophical stance to produce quality-driven, experienced-based guidelines by using a well-organised and transparent methodology that is transdisciplinary in nature. A qualitative exploratory descriptive contextual research design was employed in three phases from a theoretical phase to a construction of guideline phase to consensus building.

The ethicality of the study was established through specific reference to protection from harm, autonomy, confidentiality, compensation and publishing, over and above the general ethical processes applied at the University of Pretoria for post graduate studies.

The trustworthiness or rigour of the guidelines is demonstrated regarding the credibility transferability, dependability and conformability of the guidelines and the strategies that were employed to achieve this trustworthiness.

The next chapter of this thesis describes the first phase of this study, namely a scoping review, in detail. The reader will be introduced to the 19 hippotherapy concepts that were identified and described to structure the qualitative questionnaires.

CHAPTER 4

SCOPING REVIEW – PHASE 1

4.1 INTRODUCTION

This chapter describes Phase 1 of the study, namely a theoretical inquiry through a scoping review, as shown in Figure 4.1.

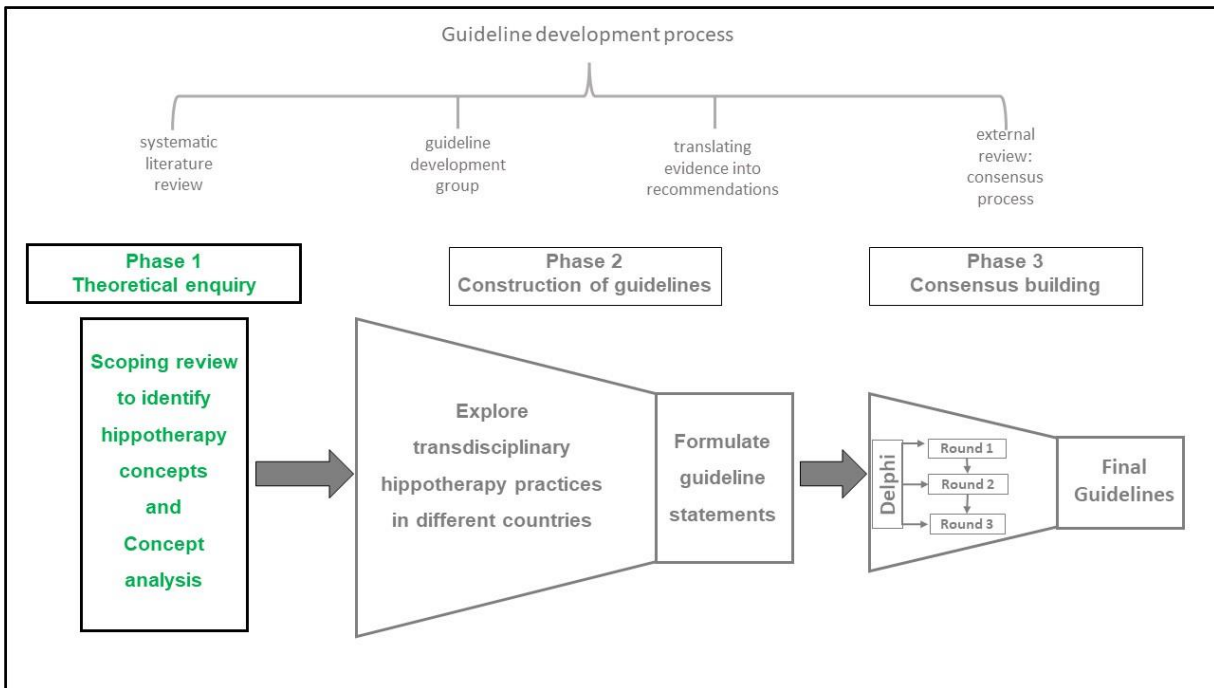


Figure 4.1: Phase 1 in the context of the study

As hippotherapy concepts were scarce, diverse, and difficult to obtain, the first phase of this study used a scoping review as suggested by Arksey and O'Malley¹⁴² and reviewed by Levac, Colquhoun and O'Brien.¹⁴³ The scoping review used published work and grey literature to explore and identify the hippotherapy concepts that were mentioned in these documents and furthermore sought more detail on the use of these concepts. The term “concepts” indicates anything taken into consideration to conduct hippotherapy for clients with spastic CP who are mounted on a moving horse. When complex interventions are developed scientifically the identification of concepts are needed early on as part of the creation of a treatment theory,³⁸ but was lacking in hippotherapy.

This scoping review fulfilled objective one of this study namely to identify, describe and explore concepts referred to in selected literature to constitute hippotherapy practices for clients with spastic CP. The literature used in the scoping review, span over a 10-year period from 2009 to 2019.

In this chapter, the researcher describes the scoping review starting by giving her positionality during the scoping review, followed by the scoping methodology and then the application of each step suggested by Arksey and O'Malley,¹⁴² the trustworthiness of the scoping review as well as a discussion of the results.

4.2 POSITIONALITY DURING THE SCOPING REVIEW

As described in Chapter 3, the positionality of the researcher needs reflection throughout each phase of the study. In her role as an EATASA course presenter and contributor to course content, the researcher drew on her experience as an OT using hippotherapy as treatment strategy. With regard to experience, the researcher's ontological stance is that experience is both constrained by the nature of the world (the therapy settings she worked in and the diagnostic groups she treated) and by her interpretation of the hippotherapy world.¹²⁷ How she fashioned or created her own knowledge (epistemology) was, therefore, influenced by these life experiences.¹²³

In Phase 1 of this study, the researcher took an outsider perspective¹³¹ by diligently documenting the written words (about the hippotherapy concepts) from the scoping documents.

When collating the concepts, the researcher took a dual stance as a therapist using hippotherapy (insider) and a researcher collating the concepts (outsider).

4.3 SCOPING METHODOLOGY

As mentioned in Chapter 3, the details of the methodology of the scoping review are provided in this chapter. A scoping review (with six stages) was done in this study because scoping reviews are indicated and applicable when studying developing interventions.¹⁴³ Scoping reviews address broad topics,^{142,144} and consequently documents with different study designs were included in this scoping review. Also note that the scoping review did

not intend to comment or assess the quality of the studies included in the scoping documents.¹⁴²⁻¹⁴³

According to Pope, Mays and Popay,¹⁴⁵ “scoping studies might aim to map the key concepts underpinning a research area...” as this scoping review intended to do. This process to identify, describe and explore the hippotherapy concepts according to the six stages suggested by Arksey and O’Malley¹⁴² was documented in a rigorous and transparent way to allow future replication of the study¹⁴² and consists of:

- **Stage 1: Identifying the research question**

The research question of a scoping review guides the scope of enquiry and should be consistent with the title.¹⁴³ The research question also direct the development of the inclusion criteria of the scoping review.¹⁴³⁻¹⁴⁴ Extra consideration should be given to the research focus contained by the question.¹⁴² Although the focus of this scoping review was on concept identification, neither the research question nor the term “concepts” were used as key phrases when searching for scoping documents

- **Stage 2: Identifying the relevant documents**

As scoping reviews have a broad focus, scoping documents need to be as comprehensive as possible while keeping the scoping question and purpose in mind.¹⁴²⁻¹⁴³ Published and unpublished studies were incorporated in the scoping documents with the aim of answering the scoping question.¹⁴² Decisions regarding the time span of the scoping review and the language of the included documents were made beforehand,¹⁴² and the team involved consisted of the researcher, the supervisor and co-supervisor of this study.¹⁴³

- **Stage 3: Selection of documents**

Inclusion and exclusion criteria (Figure 4.2), that enabled the researcher to answer the scoping question were developed prior to the scoping review, to assist the researcher in consistent decision-making throughout the document selection process.¹⁴²

- **Stage 4: Charting the data**

The process of “synthesizing and interpreting qualitative data according to key issues and themes” is called “charting the data”.¹⁴² According to Levac, Colquhoun and O’Brien¹⁴³ the decision of which variables to extract to answer the research question is

that of the researcher. Therefore, this researcher decided to extract all the hippotherapy concepts mentioned in the scoping documents.

- **Stage 5: Collating, summarising and reporting the results**

In stage 5 of the scoping review both deductive and inductive reasoning were used, and the researcher often moved between deductive and inductive reasoning during the scoping review.

As a scoping review can produce large quantities of data, presenting an overview of the findings might prove challenging.¹⁴² Therefore, Levac, Colquhoun and O'Brien¹⁴³ advise three steps namely: “analysis”, “reporting the results” and “considering the meaning of the findings as they relate to the overall study purpose”. In this scoping review, the researcher first used deductive reasoning in following a concrete pragmatic approach that led to 19 hippotherapy concepts. For example, the ‘height of the horse’, ‘the width of the horse’ and ‘the weight of the horse’ were collated to ‘the size of the horse’, but “temperature” was left as a separate heading and not included under the heading “physical environment” as it referred to both the environmental temperature and the temperature provided by the horse.

To organise these hippotherapy concepts an inductive reasoning process was then applied and the 19 hippotherapy concepts were organised under four treatment principles.

- **Stage 6: Consultation with stakeholders:**

Stage six is optional but by involving practitioners and/or consumers the results of a scoping review might be useful to the broader community,¹⁴² but should have a clearly defined purpose.¹⁴³

4.4 APPLYING SCOPING METHODOLOGY TO THIS STUDY

Hippotherapy is still in the early phases of scientific development with evidence still emerging,¹⁴³ making a scoping review a logical and practical choice to identify the hippotherapy concepts mentioned in different documents.^{142,145} The details of how the scoping methodology was applied in this study are documented below.

4.4.1 Identify the research question for the scoping review

The scoping question was: What are the theoretical concepts related to transdisciplinary hippotherapy practices for clients with spastic CP?

The question was deliberately broad in nature to summarise the breadth of available information on theoretical concepts of hippotherapy as found in literature.¹⁴²⁻¹⁴³

4.4.2 Identify the relevant documents

An electronic search strategy for English documents, that encompassed 10 years (2009 to 2019) of both published research and grey literature (doctoral and master's theses as well as the course notes from EATASA) were applied. The only hippotherapy association willing to give the researcher access to their course notes was EATASA. More documents (in five-year intervals) would have been added to the search if saturation of hippotherapy concepts identified in the literature was not reached during the charting process. Concept saturation is discussed in Section 4.4.4.

In January and February 2020, the following databases were accessed through the University of Pretoria's library website: PubMed, EBSCOhost (all), and ProQuest (Social science, dissertations and thesis global). Keywords that were used were: hippotherapy, "cerebral palsy" and treatment or intervention or therapy. A total of 220 documents were retrieved as seen in Figure 4.2. After duplications (n=89) and unavailable full texts (n=8) were eliminated 123 documents remained.

The documents that were listed in an Excel spreadsheet and articles were stored in an EndNote library for more in-depth analysis during the later stages of the study.

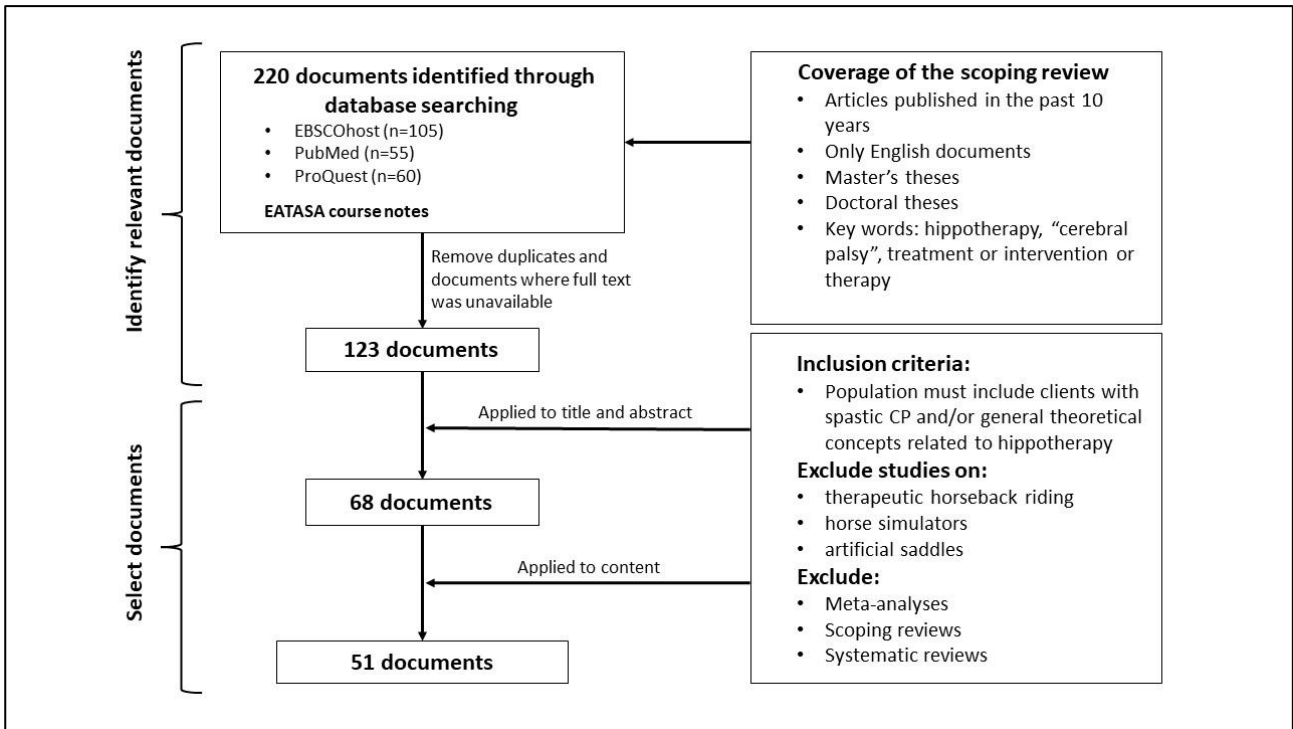


Figure 4.2: Identification and selection of documents

4.4.3 Selection of documents

The search strategy as described above yielded many irrelevant studies. During the selection process (Figure 4.2) the inclusion and exclusion criteria were firstly applied to the titles and abstracts of the documents. The population in the studies had to include clients with spastic CP and/or the study had to address general theoretical concepts related to hippotherapy. Only studies on hippotherapy were included. Studies on therapeutic horseback riding, mechanical horses, simulators or artificial saddles were excluded. All meta-analyses, scoping reviews and systematic reviews were excluded to prevent one study from being used multiple times.

After excluding 55 documents the content of the remaining 68 documents were read again taking the inclusion and exclusion criteria into consideration. This process was repeated twice by the researcher and followed up with the study supervisors to verify inclusion and exclusion. After the inclusion and exclusion criteria were applied, 50 documents remained plus the EATASA course notes, resulting in 51 documents that were included in the scoping

review. Selected documentation Table 4-1: Documentation used are summarised in Table 4-1 with first authors, publication date, country and title of the study.

Table 4-1: Documentation used

1 st Author (Year)	Country of study	Title of study
1. Antunes (2016) (Article)	Brazil	Different horse's paces during hippotherapy on spatio-temporal parameters of gait in children with bilateral spastic cerebral palsy: A feasibility study
2. Champagne (2017) (Article)	Canada	Effect of hippotherapy on motor proficiency and function in children with cerebral palsy who walk
3. Debusse (2009) (Article)	United Kingdom	Effects of hippotherapy on people with cerebral palsy from the users' perspective: a qualitative study
4. Del Rosario-Montejo (2015) (Article)	Spain	Effectiveness of equine therapy in children with psychomotor impairment
5. Deutz (2018) (Article)	Germany	Impact of hippotherapy on Gross Motor Function and Quality of Life in children with bilateral cerebral palsy: A randomized open-label crossover study
6. Doherty (2017) (Dissertation)	United States of America	The effectiveness of a six week hippotherapy intervention for children with varied developmental disabilities
7. Du Plessis (2019) (Article)	South Africa	The effect of hippotherapy on physiological cost index and walking speed of adolescents with diplegia
8. Dziuba (2013) (Article)	Poland	Thermovision techniques for evaluation of the effect of hippotherapy on changes in lower limb temperature in children with cerebral palsy (CP) – a pilot study
9. EATASA (2019) (Course notes)	South Africa	Course notes
10. El-Meniawy (2012) (Article)	Egypt	Modulation of back geometry in children with spastic diplegic cerebral palsy via hippotherapy training
11. Fizkova (2013) (Article)	Czech Republic	The effect of hippotherapy on gait in patients with spastic cerebral palsy
12. Flores (2019) (Article)	Brazil	Do the type of walking surface and the horse speed during hippotherapy modify the dynamics of sitting postural control in children with cerebral palsy?



1 st Author (Year)	Country of study	Title of study
13. Grockienė (2018) (Article)	Lithuania	Influence on functional mobility and motivation of hippotherapy for people with special needs
14. Honkavaara (2010) (Article)	Finland	The influence of short term, intensive hippotherapy on gait in children with cerebral palsy
15. Hsieh (2017) (Article)	Taiwan	Effects of hippotherapy on body functions, activities and participation in children with cerebral palsy based on ICF-CY assessments
16. Jakubowska (2019) (Thesis)	Poland	The interdisciplinary and innovativeness of methods in rehabilitation of children with cerebral palsy
17. Kelly (2015) (Thesis)	United States of America	How hippotherapy benefits individuals with cerebral palsy
18. Koca (2016) (Article)	Turkey	What is hippotherapy? The indications and effectiveness of hippotherapy.
19. Krejčí (2015) (Article)	Czech Republic	The benefit of hippotherapy for improvement of attention and memory in children with cerebral palsy: A pilot study
20. Kwon (2015) (Article)	South Korea	Effect of hippotherapy on gross motor function in children with cerebral palsy: a randomized controlled trial
21. Kwon (2011) (Article)	South Korea	Effects of hippotherapy on gait parameters in children with bilateral spastic cerebral palsy
22. Lacey (2018) (Thesis)	US	The effects of hippotherapy on the gross motor functional abilities of children with cerebral palsy using clinical outcome measures and parent/guardian reported outcomes
23. Lakomy-Gawryszewsk (2017) (Article)	Poland	The impact of hippotherapy on the quality of trunk stabilisation, evaluated by EMG biofeedback, in children with infantile cerebral palsy
24. Lipińska-Stańczak (2014) (Article)	Poland	Hippotherapy as a form of physiotherapy support in children with cerebral palsy in the opinion of parents.
25. Lucena-Anton (2018) (Article)	Spain	Effects of a hippotherapy intervention on muscle spasticity in children with cerebral palsy: a randomized controlled trial.
26. Maćków (2014) (Article)	Poland	Influence of neurophysiological hippotherapy on the transference of the centre of gravity among children with cerebral palsy



1 st Author (Year)	Country of study	Title of study
27. Manikowska (2013) (Article)	Poland	The effect of a hippotherapy session on spatiotemporal parameters of gait in children with cerebral palsy - pilot study
28. Matusiak-Wieczorek (2016) (Article)	Poland	Influence of hippotherapy on body balance in the sitting position among children with cerebral palsy
29. McGee (2009) (Article)	United States of America	Immediate effects of a hippotherapy session on gait parameters in children with spastic cerebral palsy
30. McGibbon (2009) (Article)	United States of America	Immediate and long-term effects of hippotherapy on symmetry of adductor muscle activity and functional ability in children with spastic cerebral palsy
31. Moraes (2018) (Article)	Brazil	Hippotherapy on postural balance in the sitting position of children with cerebral palsy - Longitudinal study
32. Mutoh (2019) (Article)	Japan	Effect of hippotherapy on gait symmetry in children with cerebral palsy: A pilot study
33. Mutoh (2019) (Article)	Japan	Impact of long-term hippotherapy on the walking ability of children with cerebral Palsy and quality of life of their caregivers
34. Mutoh (2018) (Article)	Japan	Impact of serial gait analyses on long-term outcome of hippotherapy in children and adolescents with cerebral palsy
35. Mutoh (2016) (Article)	Japan	Application of a tri-axial accelerometry-based portable motion recorder for the quantitative assessment of hippotherapy in children and adolescents with cerebral palsy
36. O'Mahony (2019) (Article)	Ireland	A qualitative study of Irish parents' views on hippotherapy, including its influence on their children's home-based occupations
37. Park (2014) (Article)	Korea	Effects of hippotherapy on gross motor function and functional performance of children with cerebral palsy
38. Reubens (2016) (Article)	United States of America	Intervention for an adolescent with cerebral palsy during period of accelerated
39. Ribeiro (2019) (Article)	Brazil	Analysis of the electromyographic activity of lower limb and motor function in hippotherapy practitioners with cerebral palsy
40. Rigby (2017) (Article)	United States of America	Changes in cardiorespiratory responses and kinematics with hippotherapy in youth with and without cerebral palsy

1 st Author (Year)	Country of study	Title of study
41. Rigby (2014) (Dissertation)	United States of America	Changes in cardiorespiratory responses and pelvic kinematics with hippotherapy in youth with and without cerebral palsy
42. Romsha (2015) (Article)	India	Effect of hippo therapy on balance and function in children with spastic diplegia
43. Seung Mi (2019) (Article)	Korea	Factors influencing motor outcome of hippotherapy in children with cerebral palsy
44. Shurtleff (2012) (Article)	United States of America	Long-term effects of hippotherapy on one child with cerebral palsy: a research case
45. Shurtleff (2010) (Article)	United States of America	Changes in trunk and head stability in children with cerebral palsy after hippotherapy: A pilot study
46. Shurtleff (2009) (Article)	United States of America	Changes in dynamic trunk/head stability and functional reach after hippotherapy
47. Silkwood-Sherer (2012) (Article)	United States of America	Hippotherapy-an intervention to habilitate balance deficits in children with movement disorders: a clinical trial
48. Stevens (2018) (Dissertation)	United States of America	The effect of intensive physical therapy with hippotherapy in pediatric cerebral palsy
49. Sunwoo (2012) (Article)	Korea	Hippotherapy in adult patients with chronic brain disorders: a pilot study
50. Wolff (2018) (Thesis)	United States of America	The effect of hippotherapy on seated trunk stability
51. Yokoyama (2013) (Article)	Poland	Hippotherapy to improve hypertonia caused by an autonomic imbalance in children with spastic cerebral palsy

4.4.4 Charting the data

The selected 51 scoping documents were arranged and reviewed alphabetically according to the first author. Relevant hippotherapy concepts identified in the documents were charted on an Excel spreadsheet as column headings with details on each concept quoted underneath. Saturation of concepts was reached by document 11 as no new concepts were identified onwards. However, details on concepts from all 51 documents were charted

underneath each heading (as quotation) to present an overview of the concept details available.¹⁴²

Where applicable, the concepts were collated through a deductive reasoning process. The headings such as, horse height, width and weight were collated to “horse size” and, session length, frequency of sessions and total number of sessions were collated to “dosage”. The lengthy EATASA course notes were summarised within the same Excel spreadsheet but not quoted as they presented too much detail.

A total of 19 hippotherapy concepts were identified and defined (cf. Table 4-2).

Table 4-2: Hippotherapy concepts and definitions

Hippotherapy concept	Definition
Activity characteristics	Descriptive components of an activity or activities done while the client is mounted. ¹⁴⁶ Such activities should always have a specific purpose for an individual client and aim to reach functional therapy goals.
Dosage <ul style="list-style-type: none"> • Duration of a session • Frequency • Total number of sessions 	<p>Duration of therapy session refers to the total time (in minutes) spent in one therapy session.</p> <p>Frequency is defined as number of therapy sessions per week.</p> <p>Total number of sessions can refer to the number of sessions before re-evaluation or number of sessions before discharge. Both concepts must be specified in the therapist’s protocols and must be clarified in research settings.</p>
Ground courses	The prescribed route or path in which the horse is directed to walk or trot including riding figures (also called school figures), inclines and declines, different shapes and sizes of figure of eights, walking over poles and zigzag through poles, cones or other markers.
Hippotherapy providers	The person in charge of planning and executing the hippotherapy. In this study the focus was on OTs, PTs and SLTs.
Horse breed	“A breed is defined as a group of horses with a common origin and possessing certain distinguishable characteristics that are transmitted to the offspring” ¹⁴⁷
Horse movement	An act of the horse to move his/her body ¹⁴⁶ through different gaits, using different step lengths and/or transitions. This study also discussed how the movement of the horse facilitate pelvic movement of the client.
Horse size <ul style="list-style-type: none"> • Height of the horse 	Size of the horse encompasses both the height of the horse and the width of the horse.

<ul style="list-style-type: none"> Width of the horse 	<p>Height of the horse: The height of a horse is measured from the highest point of the withers, where the neck meets the back, down to the ground. In this study the height of the horse is described relative to the height of the therapist.</p> <p>Width of the horse: Both the distance between the shoulder blades of the horse and the size of the barrel shape of the horse's body are considered.</p>
Horse tack	Tack is equipment or accessories that equip horses. This equipment includes items such as saddles, stirrups, bridles, halters, reins, bits, and harnesses. In this study the focus was on tack used during therapy.
Horse temperament ¹⁴⁶	Nature of horses as shown in the way they behave or react to situations or people.
<p>Human team members</p> <ul style="list-style-type: none"> Horse handler Side walker 	<p>Horse handler: the person directing the horse in accordance to the directions of the therapist.</p> <p>Side walker: The person that supports the client and assists the therapist while walking besides the horse.</p>
Manner of leading	Directing the horse from the ground, from either besides the horse (side leading) or from behind the horse (long lining). When leading beside the horse walk with the horse, at its shoulder or head, not ahead or behind.
Physical environment	The place in which hippotherapy is given. ¹⁴⁶ This includes indoor and outdoor possibilities.
Physical handling of the client	Hands-on support and/or facilitation of movement that a therapist gives to a client.
Positioning of the client on the horse	The act of putting a client in a particular position, ¹⁴⁶ in this case on a horse.
Precautions	"Something that is done in advance in order to prevent problems or to avoid danger" ¹⁴⁶
Temperature	How hot or cold the place is in which hippotherapy is given. ¹⁴⁶
Treatment goals	Something that you hope to achieve in treatment ¹⁴⁶ that closely relates to intervention outcomes ¹⁰⁸ and in this study written in ICF terms.
Theoretical explanations	Theory to help explain why equine movement can help to achieve treatment goals. ³
Therapy equipment	The things such as riding hats and/or rollers that are needed by a hippotherapy client to achieve the therapy goals or for safety purposes. ¹⁴⁶

To establish common language and facilitate the transdisciplinary use of these concepts in hippotherapy, further organisation thereof was needed. Possible common language was

sought in the ICF of the WHO.³⁹ The ICF provides a framework for structuring function, and specifically activity participation. The information is organised in two parts: functioning and disability, as well as contextual factors, but the ICF does not describe (and was never intended to describe) how either of these parts should be applied or addressed by therapists to help their clients to reach function and activity participation within their own context.

A model that does suggest therapeutic applications is the Vona du Toit Model of Creative Ability (VdTMoCA)¹⁴⁸ that predates the ICF. Although this model is less known, it describes therapeutic intervention using common language that aligns with the ICF's functional focus. The use of the VdTMoCA treatment principles is applicable to the transdisciplinary nature (across professions and countries) of this study and was, therefore, chosen.¹⁴⁸

Within the VdTMoCA, four interlinked treatment principles are described with the purpose of directing therapists in the use of self, use of the environment (ICF contextual factors) and use of activity participation (ICF function and disability factors) to reach functional goals.¹⁴⁸

The VdTMoCA treatment principles are: Therapeutic (handling) relationships, Presentations principles, Activity requirements and Structuring principles – these categories were used in this study to organise the 19 hippotherapy concepts.

This organisation of the 19 hippotherapy concepts under four treatment principles is depicted in Table 4-3. The reasoning behind the organisation will be provided below the table.

Table 4-3: Hippotherapy concepts structured according to the treatment principles of VdMoCA

Therapeutic (handling) relationships	Presentation principles	Structuring principles	Activity requirements
Hippotherapy providers <ul style="list-style-type: none"> • OTs • PTs • SLPs 	Theoretical explanations	Ground course in which the horse is directed to walk or trot	Treatment goals
Horse temperament	Precautions	Positioning of the client on the horse	Activity characteristics
Human team members <ul style="list-style-type: none"> • Therapist • Side walker • Horse handler 		Manner of leading	Horse breed
Physical handling of the client		Horse tack	Horse size
		Therapy equipment	Horse movement
		Physical environment	Dosage <ul style="list-style-type: none"> • Session length • Frequency • Total number of sessions
		Temperature	

4.4.4.1 Therapeutic relationship (handling)

In the therapeutic relationship (handling) principle, Vona du Toit focused on how the *therapist* interacts with the client, both verbally and non-verbally to create a purposeful therapeutic relationship.¹⁴⁸

In a hippotherapy context the human *hippotherapy team* members (side walker and horse handler) also interact with the client, both verbally and non-verbally. Team members contribute to the development of interpersonal skills and relationship building and this process forms a deliberate part of the treatment plan.¹⁴⁸ The therapist, as team leader, plan, structure and communicate the needed interaction specifics with the team before and during the sessions² to create a safe and encouraging environment¹⁴⁸ for the client. For this reason, the “therapy team” was organised under the therapeutic relationship (handling) principle.

The *horse* is a “living tool” with a *temperament* that influences the horse’s behaviour and clients often form a therapeutic bond (relationship) with their therapy horse^{65,82,149} that influences the therapy process and can be influenced by carefully considering which horse to select for the client. The horse and the team members (more directly the horse handler) also interact with one another.² As the horse is a vital team member, *horse temperament* can be described as part of the therapeutic relationship (handling) principles. Other considerations regarding the horse (such as size and movement) were organised under other treatment principles.

When needed, *physical handling* (stabilisation and facilitation) of the client enhances participation¹⁴⁸ and provides safety on a walking or trotting horse. Although the therapist plans and direct all stabilisation and facilitation, both the therapist and side walkers provide this physical handling of the client that forms part of the overall therapeutic interaction within a hippotherapy session. The *physical handling* of the client was thus grouped under the therapeutic relationship (handling) principle, with the emphasis on the word “handling”.

4.4.4.2 Presentation principles

The presentation principles provide direction on how activity participation is enabled.¹⁴⁸ Presentation principles are closely linked to the therapeutic relations and should be discussed with the team before each therapy session.

The VdTMoCA¹⁴⁸ describes a wide context of teaching and learning methods under presentation principles, but with the organisation of hippotherapy concepts (identified through the scoping review), the focus was on *theoretical explanations* for hippotherapy used by therapists. Such a theoretical explanation (often a combination of known frameworks) guides the reasoning during the therapy process.

Precautions that should be considered for each client were next grouped under this principle as many precautions link and lead to the modification of a particular task, activity or positioning of a client. Furthermore, some precautions lead to the therapist’s selection and grading of other specifics in a hippotherapy session and how the session is presented to enable activity participation.

4.4.4.3 Structuring principles

Structuring principles indicate the principles in hippotherapy that the therapist can grade in relation to the environment and materials used. Structuring principles influence the client's activity participation.¹⁴⁸

Ground courses in which the horse is directed to walk or trot, facilitate specific movement reactions in the client's body. The planning of what ground course to use and how to grade the order of use of ground courses is an important structuring principle. This requires professional reasoning from the therapist when planning and executing hippotherapy.

The *positioning* of the client on the horse links with the chosen ground course to achieve the therapy goals.

The *manner of leading* influence (arrange, organise or structure),¹⁵⁰ the quality of movement of the therapy horse as well as the safety of the client fit best under the structuring treatment principles.

Horse tack can facilitate or inhibit the client's muscle movement and sensory experience of movement. On the other hand, the presence and choice of therapy *equipment* have a direct influence on the activity participation of a client in a hippotherapy session. Therefore, both tack and equipment were placed under structuring principles.

The therapist might not always have a choice about the *physical environment* (area, indoor or outdoor, flooring) available, or the *environmental temperature*, but have a responsibility to pay attention to these environmental factors and possible adaptations that might be needed during hippotherapy to accommodate these concepts and the influence thereof on the client.

4.4.4.4 Activity requirements

Hippotherapy concepts that relate to the requirements and characteristics of activities were organised under this treatment principle.¹⁴⁸ These do not prescribe specific activities but take requirements for hippotherapy activities into consideration. Therapists use activity analysis skills and grade activity in terms of materials, objects, tools, people and situations when considering activity requirements.¹⁴⁸

Individually planned *treatment goals* that are relevant to each client were listed as the first activity requirement.¹⁴⁸ Such goals will have a direct impact on what activities are selected and how it is graded.

Activity characteristics as such need no justification to be organised under this principle and include elements such as the two or three dimensional nature of the activity, when to use sport-related activities and how to incorporate communication skills into activities, to name but a few.

Horse breed influences the physical characteristics of the horse as an activity requirement, as opposed to the desired temperament (under therapeutic relationships) and desired movements (under structuring principles). *Horse size* needs to be taken into consideration within the activity analysis that the therapist performs as this will influence many other factors such as physical handling (therapeutic relation/handling principle) and safety precautions.

Dosage (session length, frequency and total number of sessions) influences the duration of every aspect of hippotherapy. How long each session is, how frequently sessions are attended and when sessions are permanently terminated, are part of the planning and grading responsibilities of the therapist.

4.4.5 Collating, summarising and reporting of results.

The complex nature of hippotherapy as an intervention strategy was apparent throughout this scoping review and detailed results will now be reported under each concept heading and is illustrated in Annexure I. Although the concept headings were already collated through deductive reasoning, the results are now collated and summarised.

4.4.6 Therapeutic relationships

Components of therapeutic relationships in hippotherapy were found in 50 of the 51 documents.

4.4.6.1 Hippotherapy providers

Forty eight (94%) documents gave an indication of who provided or should provide hippotherapy namely PTs (n=36),^{2,30,33-34,54-58,61-62,64-67,69-72,74,82,104,114,130,149,151-161} OTs

(n=22)^{2,29,31,33,53,58,61,66-67,69,71-72,74,149,152-154,157-161} and SLPs (n=14)^{2,33,58,69,71-72,74,152-154,157-159,161} and often mentioned more than one therapy profession in one document.

Four documents¹⁶²⁻¹⁶⁵ used the term “therapist” without specifying the therapy profession, with some documents adding qualifying descriptions such as chief therapist,¹⁶⁴ main therapist¹⁶⁵ or treating therapist.¹⁶³ Other hippotherapy providers that were mentioned were “OT assistants”,⁶⁶⁻⁶⁷ “hippotherapists”,¹⁶⁴⁻¹⁶⁶ “therapeutic riding instructors”^{31,68,73,81} or “equine therapy specialist”,¹⁵⁶ “the primary investigator”⁹⁵ and “educator”.¹¹⁴ Lastly a psychologist,⁵⁸ a physician⁶² and allied health student were also mentioned as hippotherapy providers.³¹ This study focused on OTs, PTs and SLPs and therefore the term “therapists” will be used in the rest of this thesis.

This scoping review documents often mentioned that the therapist must be experienced⁵³⁻⁵⁶ and/or trained,^{29,64,73,149,157,161} licenced^{33-34,58,66-67,163} or certified,^{54,71,82,158} suggesting a professional status and extra training of the therapist providing hippotherapy without expanding on the qualifications needed. In South Africa, EATASA specifies that OTs, PTs and SLPs must be registered with the Health Professions Council of South Africa (HPCSA), or an official health-related body in case of international participants, to take part in their hippotherapy course.² Other countries might have other recommendations for taking part in their courses.

4.4.6.2 The human therapy team members

Besides the therapist, other human team members were mentioned in 35 documents (69%). In 27 documents, a person who directs (leads) the horse according to instructions from the therapist, were mentioned. Different titles such as horse handler,^{29,53-54,56-57,65,69-70,72,82,130,152} horse leader,^{2,34,55,64,66-67,114} guide⁶³ or just a “person leading the horse”¹⁶⁴⁻¹⁶⁵ were used. In some documents it was clear that the person performing the task also held a different job title such as an “equestrian”¹⁵¹ or “trained assistant.”^{68,81,149} In this study, it was decided to use the term “horse handler” as it suggests a broader function than merely the leading of the horse. Some documents stated that the horse handler should either be trained^{64,68,81,130,149} and/or be experienced^{155,63-64,66-67,70,72,95,151} within this role.

Another member of the team, mentioned in 28 documents (53%), was a person that fulfilled the role of supporting the client and assisting the therapist while walking besides the horse. Such person was mostly called a “side walker”^{2,29,33-34,53,55,58,65-69,71-72,74,81,104,149,152,155,160} or in one article called a “lateral assistant”.⁶³ These side walkers might be volunteers or employees at the stable yard that fulfilled a double role such as a riding instructor that acted as side walker within a session. Most documents indicated at least one side walker walking besides the horse with the therapist walking on the opposite side giving the needed support or facilitation.^{2,29,58,74,104,152} Five documents mentioned two side walkers but did not specify where the therapist stood while giving instructions^{55,64,81,152,160} and one document stated that the occupational therapist stood in the middle of the arena from where she observed the clients.⁵³ Again there was a notion that side walkers needed training^{55,67,69} and/or experience.^{63,66,72}

Other team members that were mentioned in some documents were: educational therapist,¹⁵³ physical educator,⁷⁰ qualified therapeutic team,¹⁶⁵ horse carer,¹⁵³ horse expert,¹⁰⁴ horse trainer,¹⁵⁵ therapeutic riding instructor,¹⁶¹ assistant,¹⁶⁵ allied health student interns¹⁶¹ and auxiliary support staff,¹⁶¹ but they did not describe the function of these team members.

4.4.6.3 Horse temperament

Although the movement of a horse is seen as the therapy tool within hippotherapy,³ the horse has its own temperament, adding another component to therapeutic relationships.¹⁰⁷ Six documents mentioned the temperament of the therapy horse by using the following words: “quiet”,² “steady”,² “non-aggressive and social”,¹⁰⁴ “docile”,⁵⁹ “never skittish”,³⁰ have an “exemplary”,^{54,57} “mild”,³⁰ “placid”³⁰ and “proper”³⁰ temperament. The EATASA course notes² further state that a therapy horse “must excel in ground manners”,² and be “psychologically ready to do therapy”² Three documents mentioned the importance of the horse temperament when matching a horse with a client.^{58,67,81}

4.4.6.4 Physical handling (support or facilitation) given to the client

Physical handling of a client by the therapist or side walker can be done to support the client or to facilitate movement of the client.² Ten scoping documents (20%) mentioned physical

handling of the client without a clear description,^{55,57-58,65,70,72,74,114,152,160} while nine (18%) documents focused on the type of support given to the clients when receiving hippotherapy. This ranged from simply stating that no support was given,^{63,81,167} while others added more detail such as hand placement,^{2,34,53-54,164-165} on the client's ankles^{2,53} knees,² thighs,² legs³⁴ or pelvis.^{54,164-165}

Special equipment to support the pelvis was mentioned twice.^{2,74} Some documents stated who (therapist or riding instructor or side walker)^{58,70,114} or how many people^{34,152} should give support to ensure the safety of the client. One document specified that maximum assistance was needed by a client on GMFCS level IV, performing a specific exercise⁵⁷ and one other indicated that postural support was needed without stating specifics.⁵⁵ The EATASA course notes² gave more in-depth descriptions of physical support and facilitation.

4.4.7 Presentation principles

The second treatment principle described by Vona du Toit.¹⁴⁸ indicates how therapy should be presented to enhance client participation.¹⁴⁸ The theoretical explanations used, and applicable precautions can all be seen as presentation principles. The presentation principles exclude contra-indications to hippotherapy that are outside the scope of this scoping review.

4.4.7.1 Theoretical explanations

Authors of 50 of the 51 documents (98%) in this scoping review gave a theoretical explanation for hippotherapy but only 14 documents (27%) named specific theoretical frameworks. These frameworks were: Global Rehabilitation Method with Horses,⁷³ neurodevelopment treatment,^{2,29} sensory integration,^{29,68,152} neurophysiological principles,^{29,60,151,161,164-166} the systems theory,² dynamic system theory,¹⁵² occupational functional model,² theory of neuronal group selection,¹⁵² neuromuscular theory⁷² and a motor learning and control theory.^{34,66} Six authors^{67,72,153,157,160} mentioned the effect of hippotherapy on different systems, which can be interpreted as using the systems or dynamic systems theory.

Thirty one documents (61%) mentioned that the movement of the horse have an effect on the client's pelvis that simulates human walking^{2,29-30,34,53,58,60,62-65,71,73,95,104,130,151,155-156,158-}

160,163-164 and/or influence posture,^{29,53,55,61,63,65-66,114,164} trunk control^{54-55,64,66,155,166,168} and/or other body functions^{29,31,53-55,60,64-65,151,155,163-164} and that the movement of the horse can be influenced by the therapist.^{2,29,61,63,95,149,157,160} Authors often stated that the horse provides a dynamic treatment surface,^{54,61,64,155,160} multidimensional movement²⁹ and/or three-dimensional movement.^{59,62,64,70,82,95,104,114,149,151,156,160,163} While some authors only mentioned the movement of the horse vaguely^{31,157} or within other theoretical explanations of hippotherapy such as the translation of the centre of gravity in different planes,^{33,95} others gave detailed explanations of the movement impact within each step that the horse takes.^{33-34,67,159}

Further theoretical explanations for hippotherapy were the influence of the rhythm of the horse's movement,^{30,33-34,54,56-57,59-60,66-67,69,71,73-74,104,114,149,151,153-154,159-160,163} various sensory inputs^{33-34,58,66-67,69,95,151,153,159-160} and how hippotherapy influences tone,^{30,56,74,104,151,154,159-160,163-164} posture,^{54,59,74,114,149} occupational performance,^{29,58} spatial and body awareness,¹⁵¹ neuromuscular development,⁵⁴ flexibility of the client^{59,149} and arousal and attention³³ to name but a few.

And lastly, there were documents that theorise on the motivational effect,^{54,57,67,73,81} pleasantness/fun^{56,67,160} and psychosocial interactions with the horse^{30,65,82,149} and the influence thereof on the treatment outcome.

4.4.7.2 Precautions

Other than the EATASA course notes, with in-depth descriptions,² only two documents explicitly mentioned the word "precautions"^{29,66} Shurtleff et al.⁶⁶ stated that an OT or a PT scanned the clients and considered precautions, but did not specify the precautions that were taken and Du Plessis et al.²⁹ measured heart rate throughout the sessions to ensure that the calculated maximum heart rate of each client was not exceeded.

In 15 scoping documents (29%) precautions could be deducted from considerations that were mentioned:

- external safety gear such as riding hats,^{59,64,104,155} foot wear¹⁰⁴ and a safety belt¹⁵¹
- pre-approval from a physician for the participation in hippotherapy^{59,161}
- familiarisation with the therapy procedures before each hippotherapy session⁷¹

- pain,³⁴ contractures⁶⁰ and movement restrictions⁶⁰ or movement reactions⁵⁵
- client fatigue and rest periods^{70,163} and monitoring heart rate²⁹
- body weight limitations^{54,161}
- range of motion^{60,70}
- preparation before a session⁷¹

4.4.8 Structuring principles

Structuring principles (the third treatment principle) indicates the environmental concepts in hippotherapy that can be graded according to the needs of the client.¹⁴⁸ This includes the ground courses in which the horse is directed to walk, the position of the client on the horse, manner of leading, horse tack, deciding on the use of therapy equipment, the physical environment (indoors or outdoors, flooring) and temperature.

4.4.8.1 Ground course on which the horse is directed to walk or trot

The influence of a planned route or “designated track” that the horse walks or trots in on the client was discussed in the EATASA course notes² and mentioned in three documents.^{57,67,69}

Other documents mentioned various combinations of ground courses used without describing the influence on the client and the professional reasoning for choosing the ground course, words such as “designated track”⁵⁴ made it clear that the ground courses were planned. Straight lines,^{2,57,66-67,69-70} gentle curves,^{2,57,70} large and small circles (both clockwise and counter clockwise),^{2,56-57,66-67,69,164} winding rides (serpentine),^{2,57,68-69,81} walking on uneven terrain,^{57,67,114} inclines and declines,^{70,114} zigzags with wide and tight angled turns,^{2,66-70,81} figure-eights^{2,66,69,114} and “walking in a rectangular shape around the treatment arena”^{61,68,81} were all mentioned.

4.4.8.2 Client positioning

Twenty-seven documents (53%) described positioning of a client on the horse. The most common positions are illustrated in Figure 4.3. Other positions that were mentioned were the placement of the client’s arms for instance taking weight on forearms while lying prone over the barrel of the horse⁵³ or hands placed on thighs while sitting with feet in stirrups.^{59,63} Standing in stirrups,⁵³ sitting cross-legged or kneeling,^{34,66-67,69} standing upright on a moving



horse^{34,72} or transitioning between positions^{57-58,66-67,69} were positions found in documents that advocated for the use of vaulting (gymnastics on a moving horse) positions.

Reasoning for positioning choices was only given in one document stating that leaning forward while seated or embracing the horse around the neck, provided different sensory input.⁶² In contrast with most documents, one document cautioned that an exaggerated reaction to change in position will lead to increased postural tone and result in inadequate postural adjustments and abnormal movement patterns.⁵⁵

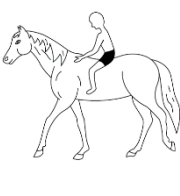
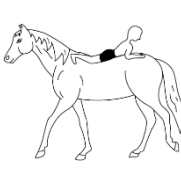
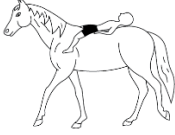
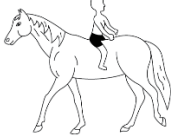
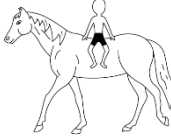
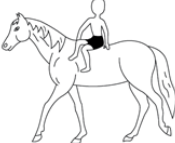
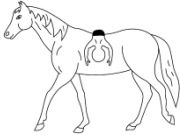
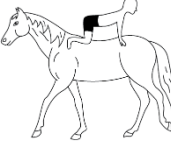

<p>Forwards sitting astride 2,33-34,53-54,57,62,65-67,69-70,73,81,114,149,152,156,163-164</p> 	<p>Backward prone 2,33,70-71,114,158</p> 	<p>Backwards supine 2,33,70-71,158</p> 
<p>Backwards sitting 2,33-34,53,57-58,65-67,69-71,158</p> 	<p>Side sitting 2,33-34,53,57,65-67,69-71,152,158</p> 	<p>Modified side sitting 2,33,57</p> 
<p>Prone lying "over the barrel" 2,53,71,114,158</p> 	<p>On all fours backwards 2,34,53,66-67,69,72</p> 	<p>On all fours forwards 2,34,53,66-67,69,72</p> 

Figure 4.3 Positioning of the client

4.4.8.3 Manner of leading

The leading of the horse was mentioned in 13 documents (25%). Whenever a document said that the horse was led (n=11) it was assumed that side leading was implied.^{2,34,53,55,57,66,68-70,72,165} Long lining, where the horse is steered on the ground (from behind) with two lines, or reins, attached to either side of the horse, were mentioned in three documents.^{2,66,151} Triangular leading, where the horse is led by two horse handlers (one on each side) where each handler has one of the two reins, was only mentioned once² and so was the leading of the therapy horse from the back of another horse.⁶¹

4.4.8.4 Horse tack

Six documents (12%) mentioned tack for leading the horse such as a halter^{53,72,95} and lead chain (or rope)^{2,53,58,72,95} or a bridle,^{58,63} or long reins.²

Two documents mentioned reins^{58,72} but it was unclear if the purpose of the reins was for leading the horse or for the client to hold or steer the horse.

The other focus areas in documents were on tack used for seating and are listed here regarding the amount of support provided by the tack:

- no equipment was used at all and the clients sat on the bare back of the horse (n=2)^{71,158}
- a bare back pad, numnah or fleece saddle or saddle blanket, attached to the horse by a flat surcingle (n=17)^{2,53-59,64-65,69-70,72,95,151,155,158}
- a saddle (some specified that it is an English saddle, Australian saddle or made of wool) (n=11)^{2,56-58,61,63,68,71,73,158,160} and one author mentioned that the saddle was adapted to allow the client to feel more direct movement from the horse⁶¹
- a western saddle (n=2)^{2,58}

Lastly, some documents mentioned the use of stirrups^{2,53,57,59,61,63,70,95} to support standing while the horse is walking, which became a treatment goal.

4.4.8.5 Therapy equipment

Most of the 22 documents (43%) that commented on equipment, mentioned equipment that focused on safety. Sixteen documents mentioned a safety helmet,^{2,34,53,57-59,61,64,68,72,81,95,104,149,155,160} and/or some kind of safety belt (that the client wears)^{2,53,58,61} and one also mentioned footwear.¹⁰⁴ A handle or strap for the client to hold onto was mentioned in eight documents,^{2,58,69-70,72-74,151} with the EATASA course notes detailing advantages and disadvantages of different safety equipment.²

The EATASA course notes also described ancillary equipment that might be used when doing activities on horseback, this includes therapy wedges and rollers.² Two other documents echoed this by mentioning that special pelvic support for clients on GMFCS level III^{72,74} and a compressor belt to allow for progression of core and gluteal muscle strengthening in alignment during exercises⁷² and to lessen the tactile and verbal cues needed from the therapist in different positions on horseback.⁷²

4.4.8.6 Physical environment

Twenty four documents (47%) mentioned the physical environment where hippotherapy was conducted such as:

- indoor arenas (n=10)^{34,53,55,64,69,72,82,155,160,165} some documents indicated the size of the arena as 18m x 27m,^{34,64,155,160} or 10mx30m¹⁶⁵ or 27m x 12m^{68,81}
- outdoor arenas (n=6)^{31,53,60,72,81,162}
- unspecified arenas (n=2)^{68,169}
- outdoor trails (n=3) (when the weather permitted)^{53,69,114} such as a “quiet forest environment”¹¹²
- uneven terrain (n=1)⁵⁷
- various kinds of flooring (n=7), soft and sandy^{34,70-71} or rough and rocky,⁷¹ plain ground¹⁵⁹ and grass^{59,70} and asphalt surface⁶³
- combination of the size and shape of the working area with the flooring that was used, such as “sand arena”,⁷⁰ “a sand ring”,⁷⁰ “cemented ring”,⁵⁹ and “asphalt pavement”⁷⁰
- accessibility²
- mounting area²
- cleanliness²

4.4.8.7 Temperature

One document mentioned temperature in the arena, which was applicable to their outcome that measured the influence of the hippotherapy on lower limb temperature.⁶⁰ Another document stated that in some geographical areas winter months might be too cold for hippotherapy if it is not done in a heated arena¹⁵² and other documents reasoned that the influence of the horse’s warmth on the client,^{30,60,104,149,160-161,163} could be seen as theoretical support of hippotherapy, as warmth/heat has an influence on muscle tone.

4.4.9 Activity requirements

Activity requirements (the fourth treatment principle) point to characteristics and requirements of activities used to reach the therapy goals of each client.¹⁴⁸ Therapists are required to use professional reasoning, when grading activity requirements with regard to

the horse (breed, size, movement and tack), treatment goals (long term, medium, per session), activity characteristics and dosage.¹⁴⁸

4.4.9.1 Treatment goals

Many different treatment goals were mentioned in the scoping documents. Three scoping review documents suggested that therapists should collaborate with clients and their family to set functional treatment goals.^{2,58,65}

The ICF terminology was used by the researcher to report on goals mentioned in the literature.

The most common goals were to improve specific body functions under neuromusculoskeletal and movement-related functions (n=18),^{2,34,57-58,61-62,65,71-72,81,104,151-153,156,161,164,166} sensory functions (n=9)^{2,34,58,61,71,81,149,153,161} and mental functions (n=8).^{34,57-58,71-72,81,149,153} Voice and speech functions were also mentioned,^{2,153} as was functions of the digestive system (masticatory functions)¹⁵³ and functions of the cardiovascular system.^{71,161} The EATASA course notes went further explaining how different body functions can be influenced by the movement of the horse and encouraged therapists to apply professional reasoning to achieve treatment goals.²

Goals regarding activities and participation were mostly linked to mobility (n=13),^{34,53,57-58,61,65,72,81,104,151,153,156,161} two to communication^{2,153} and two to interpersonal relationships.^{62,157} Only one document mentioned disability and specify that for diplegic clients the focus of hippotherapy is on the prevention of deformities.⁶¹

It was clear that the scoping review documents reckoned that hippotherapy treatment goals should focus on the improvement of body function,^{61,72} and activities^{58,153,157} that can lead to overall improved quality of life.^{58,157}

4.4.9.2 Activity characteristics

Forty one (80%) of the 51 documents described activities used in hippotherapy. These activities were selected to reach individualised treatment goals for each client (n=12).^{2,29,57-58,66,69-71,95,155,158,160}

Activity characteristics ranged in complexity, such as:

- simply sitting on a moving horse (n=21)^{2,30-31,34,54,56-59,61,63-64,68,74,81,151,155,160,162,164-165}
- taking part in exercises(n=28)^{2,30-31,33,53,55,57-58,61-62,64-67,69-71,81,149,151-153,155,158,160,162-163,165}
- sport related activities such as placing rings or containers on poles or hooks or reaching to grasp objects or catching and throwing a ball or hitting a target(n=9)^{2,53,58,66-67,69,71,114,158}
- vaulting (gymnastics on a moving horse) and vaulting positions(n=3)^{2,58,72}
- activities that include fine motor aspects such as putting/taking out pegs/clips in the mane or putting stickers on the horse (n=2)^{2,58}
- activities that introduce cognitive aspects (n=4)^{2,58,66-67}
- activities that encourage interaction and communication with the horse, the instructors and other supporting staff and talking about emotions (n=2).^{2,58}

Some documents described positioning of the client on the horse and/or the gait and speed of the horse and ground courses as part of the activity description, making the description of activities more complex.^{2,57-58,66-67,70,72,74,165}

4.4.9.3 Horse breed

No document stated what horse breed should be used in hippotherapy, as the focus within hippotherapy seems to be more on the kind of movement that is needed than the kind of horse that provides it. Yet six documents did mention 12 different breeds namely:

- Silesian noriker¹¹⁴
- Lipnicki horse¹¹⁴
- Haflinger^{81,114,162}
- Czech warm-blooded horse¹¹⁴
- Czech-Moravian Belgian horse¹¹⁴
- A crossbred horse⁵⁶
- A Western horse³⁴
- Crioulo⁵⁹
- Persian Arab⁵⁹
- Thoroughbreds^{81,162}
- Welsh ponies^{81,162}
- Hokkaido^{81,162}
- Native horses^{81,162}
- Arabian horse^{81,162}

4.4.9.4 Horse size

Horse size was described in accordance to height, width and weight of the horse, but not all studies gave all of these measurements. Heights that were given varied between 135cm to 162cm at the withers of the horse^{56,59,63-64,70,155,160}, one document said that a 'wide trunk'¹⁶⁴

is needed and another specified the measures of the ‘horse’s barrel’⁷² and given body mass varied between 294kg to 530kg^{56,64,70,155,160}. Twelve documents (24%) mentioned that size played a role in the matching of the client to the horse^{2,29,31,54,57-58,64,66-67,81,155,160}. The specific reasoning of the horse-client match in relation to size was not given in any document.

4.4.9.5 Horse movement

The notion that horse movement played a role in the selection and matching of a specific horse with a specific client was found in 11 documents.^{2,29,31,58,64,66,71,81,114,152,158} No details, other than within the EATASA course notes,² on this matching process and movement assessment were given. Some documents stated that horse movement can be “altered”,²⁹ “directed”^{72,161} “adjusted”,¹⁶⁴ “changed”,¹⁶⁵ “modified”,^{57,61} “manipulated”,^{63,74} “varied”,¹³⁰ or “graded”^{2,153} by the therapist to achieve therapeutic goals, others only stated what horse gaits were used within their study^{34,54-59,61-62,65-70,74,81,114,156,159,164,170} or the effect of the gait on the client^{2,58,72,153,161}.

Specific aspects of horse movement that were mentioned were: “soundness”,^{2,54} “stride length” and/or “step length”,^{2,54,71} “free rhythmic movement”^{2,54,57,69} and that “the horse must be capable of different gaits”.²

4.4.9.6 Dosage

Dosage encompasses duration of each session, frequency of sessions (how many sessions per week) and total number of sessions. Most documents reported some dosage information with considerable dosing variations that applied to the studies that were conducted. The reported session duration (n=42) varied between 15 minutes and one hour,^{31,53,55-56,58,65-66,69,71,73,95,149,151,158-159,161,163} while the majority of documents (n=25) reported a session duration of 30 minutes.^{29,31,33-34,53-54,57,59-61,63-64,68,70,74,81,104,114,154-156,160,162,164-165} The frequency of sessions varied between one session a week (n=26),^{29,53-55,57-59,61,65-69,71,73,81-82,130,154,156-158,161-162,165} two sessions per week (n=13),^{31,34,64,70,72,82,95,149,155-156,159-160,166} daily sessions (n=3)^{65,114,154} and even once off sessions.^{56-57,60,63,74,156,163-164} The total number of sessions received by clients within each study varied between a total of one session (n=8 documents),^{56-57,60,63,74,156,163-164} and weekly sessions for two years.^{65,68} Twelve sessions (n=9 documents)^{29,54,57,66-67,69-70,156,165} and eight sessions (n=8 documents)^{33,64,104,149,155,157,71,158} were mentioned most often as the total number of sessions.

4.5 DISCUSSION OF THE RESULTS

This study formulated guidelines on the specific concepts in hippotherapy through a systematically phased approach. This scoping review (as first phase) identified and described 19 hippotherapy concepts found in 51 documents from 2009 to 2019 and grouped them under four main treatment principles to be used in the other two phases of this study. The number of interacting concepts emphasised the complex nature of hippotherapy as well as the level of planning and skill that is required from the provider that uses hippotherapy. However, specifics on the professional reasoning when deciding on the use of each of these concepts were limited or lacking in the scoping documents.

As no previous studies could be found that provided concepts that encompasses all aspects in hippotherapy, this study was initiated to identify each concept (including physical aspects) taken into consideration when conducting hippotherapy with clients with CP. This scoping review started in October 2019 and the study by Wood and Fields³ was published online in September 2019 and came to the researcher's attention only after the completion of this scoping review, but posed no problem to this scoping review as mapping reviews were excluded from this study. Their study³ was then incorporated into this thesis as a valuable source. Their study comprehensively mapped peer-reviewed studies of hippotherapy done between 1980 and 2018.³ They focused, amongst others, on aspects such as definitions of hippotherapy, including a list of hippotherapy components, clients receiving hippotherapy, and general development of hippotherapy over the years. Wood and Fields³ confirmed most of the results found in this scoping review, yet this scoping review contributed to 11 new concepts which were not mentioned by Wood and Fields.³ These concepts are: human team members, horse temperament, horse breed, horse size, precautions, physical handling of the client, manner of leading, physical environment, temperature, therapy equipment and horse tack.

Their suggestion that there was a neglect in the formulation and explaining of the nature of hippotherapy within the foundational scientific development confirmed the reasoning behind this study. They also found widespread differences in how hippotherapy was implemented and what the targeted outcomes were.³

Each hippotherapy concept under the appropriate treatment principle¹⁴⁸ will now be discussed.

4.5.1 Therapeutic relationship

The number of interacting concepts within the hippotherapy therapeutic relations emphasises the level of planning and skill that is needed from the therapist and, therefore, also the need for a postgraduate course in hippotherapy. Each team member needs to be trained and competent within their role. Pairing the right horse with the client, communicating and directing the team in executing the hippotherapy are part of the first treatment principle that needs consideration and that will benefit from clear description and future research.

4.5.1.1 The therapist

This scoping review identified different professions that provide hippotherapy. The term “hippotherapist” was mentioned in three of the documents¹⁶⁴⁻¹⁶⁶ and is often heard when people talk about hippotherapy, but EATASA,² EFOT-UK and AHA discourage the use of this term as hippotherapy is but one treatment tool that can be used by different professions. In South Africa, EATASA² regards hippotherapy as a treatment strategy only used by OTs, PTs and SLPs. To clarify who is using the movement of the horse as a therapy tool, it is proposed that therapists should identify their professional academic degree when describing the therapy that they do, for example, an occupational therapist that incorporates hippotherapy as treatment strategy.³

Scarce descriptions of specific training were also presented in these scoping documents, as was found by Wood and Fields³ too. The AHA addresses training of therapists in their best practice statements for therapists practicing in the United States of America.¹⁴ Owing to the complexities of hippotherapy, identified in this scoping review, the researcher proposes that the providers need postgraduate training in hippotherapy.

During any therapy the therapist is responsible for the therapeutic relationship with the client. The therapist plans and executes both verbal and non-verbal interactions (including physical support or facilitation) with the client to enable a positive response.¹⁴⁸ The focus of this study was on the therapeutic relationship of the OT, SLP or PT with clients with spastic CP along

with other team members and a horse, making the role of the therapist more complex than in more traditional treatment settings.

4.5.1.2 The human therapy team members

Within the scoping documents other team members such as educators^{70,114,153} and a horse carer¹⁵³ were also mentioned but according to EATASA,² AHA and EFOT-UK they do not form part of the primary hippotherapy team and will thus not be discussed further within this study.

Besides the therapist, who plans and executes the session, there are also a *horse handler* that directs the horse in accordance with the specifications given by the therapist and a *side walker*. The role of a side walker is to assist the therapist and support the client when needed.

Several scoping documents mentioned the need to be trained and/or experienced within the role of a horse handler,^{64,67-68,70,72,81,95,130,149,155} and a side walker,^{55,63,67,69,72} but did not mention the specifics on training or the role that the relationship between team members play. From personal experience the researcher found these relationships and teamwork between the therapist and the members of the team vital to the success of a hippotherapy session.

4.5.1.3 Horse temperament

The horse is central to hippotherapy and different aspects of the horse thus fits into different treatment principles. With regard to the therapeutic relationships, the focus was on the kind of temperament that a therapy horse needs. The scoping documents were clear on the importance of temperament, but vague in their description thereof. Clearly more definitive descriptions of the temperament of a hippotherapy horse are needed.

4.5.1.4 Physical handling of the client

Although more research is needed to see if the kind of support that the client receives have a significant influence on the therapy outcome, only 19 of the scoping documents mentioned support at all. This lack of information only states that little is reported on the support that is given and not necessarily that support was not important or not given. Physical facilitation

of client movement was mentioned less in five documents in total again indicating a lack in the description of the movement facilitation done by therapists during hippotherapy sessions.

4.5.2 Presentation principles

Presentation principles, which are closely linked to the therapeutic relationships, should be taken into consideration when the hippotherapy is planned, when the session is discussed with the therapy team before each session, as well as during the execution of the hippotherapy session. Each presentation principle can benefit from more in-depth description and research.

4.5.2.1 Theoretical explanations

There are not yet a theoretical framework that encompasses all the complexities of hippotherapy. Authors of the scoping documents used different angles from which they theorised about hippotherapy. Some authors focused on the targeted outcomes of the hippotherapy and uses existing theoretical frameworks (Section 4.4.7.1) to plan and execute sessions. Others focused on the different movement aspects of the horse for example the rhythm of the horse and how that will influence muscle tone.

An empirical theory^{3,171-173} in hippotherapy is that a walking horse provides a movement pattern (and thus sensory experience) in a human pelvis astride a horse, similar to a human walking, this is then used as reasoning to explain improved walking.³ As Du Plessis et al.²⁹ explained in the first hippotherapy study done in South Africa: “*The multidimensional movement of the horse’s pelvis generates similar pelvic movements in the client, which mimic the pelvic movement that occurs during normal human walking. The therapist can increase or decrease the postural challenge by altering the movement and direction of the horse.*”²⁹ The rhythmical pattern positively influences among others, muscle tone, equilibrium reactions and sensory awareness, but does not provide a theoretical explanation that encompasses all of the mentioned treatment goals such as communication and speech and visual perception.

Other authors focused on the social interaction, the bond with the horse and how various systems influence one another.

Various theoretical explanations might be applicable but still need to be scientifically formulated for a hippotherapy theoretical framework.

4.5.2.2 Precautions

Experienced therapists routinely take precautions into consideration when planning and executing any therapy. Three documents did mention the word “precaution” and 13 others mentioned considerations from which precautions could be deducted. One could also argue that precautions should be mentioned more explicitly in articles on hippotherapy to ensure the safety of clients and advocate for postgraduate training of service providers.

4.5.3 Structuring principles

Structuring principles encompass seven gradable hippotherapy concepts to contribute to the client reaching the functional therapy goals. They are ground courses, positioning of the client on the horse, manner of leading, horse tack, therapy equipment, physical environment and temperature.

4.5.3.1 Ground courses in which the horse is directed to walk or trot

Ground courses were mentioned in 13 documents, but other than the EATASA course notes,² the influence thereof on the client, were only mentioned in three other scoping documents.

4.5.3.2 Client positioning

In the scoping documents, positioning of the client on the horse and transitioning between positions within a therapy session were mentioned in 27 documents. Reasoning for different positions were not given within the scoping documents, except in the EATASA² course notes. One can assume that various positions on a moving horse can influence the sensory system of a client and must be considered with the treatment goals in mind, but the researcher could not find other studies that solely focus on the effect of each position on clients either. Again, this scoping review draws attention to a concept in hippotherapy that still needs further investigation, while bearing in mind the complexities of such proposed studies.

4.5.3.3 Manner of leading

Side leading, long lining and triangular leading were all mentioned in the scoping documents, but no research could be found on the impact of each way of leading on the client. The EATASA course notes² state that a horse can work in better “frame” when long lining is used, but again did not give any references for the significance thereof on the client.

4.5.3.4 Horse Tack

Tack for leading the horse and for seating the client on the horse was mentioned in the scoping documents. Fashionable usage of tack might change, or new tack might be developed, but the reasoning behind the selection of specific tack might be of greater importance in a hippotherapy setting. Therefore, the reasoning behind the selection of specific tack is of greater value when guidelines are developed than the actual tack that was mentioned within the scoping documents. Within this phase of the study the amount of support given by different seating options on the horse was used within descriptions. Further research on the professional reasoning on the amount of seating support or the movement that is facilitated to reach therapy goals is needed.

The tack used for leading was also mentioned within the scoping documents again without a rationale for the choice.

4.5.3.5 Therapy equipment

Safety equipment was mentioned most often in the scoping documents but equipment to support clients and enhance therapy as mentioned in the EATASA course notes² and used more regularly in the Czech republic,¹⁵ deserve further research.

4.5.3.6 Physical environment

At this stage the physical environment seems to be merely a pragmatic decision. This includes outdoor versus indoor arenas, the size of the arena and the horse walking on different surfaces. More research is needed to establish the effect of the physical environment on the outcome of the therapy.

4.5.3.7 Temperature

The influence of the environmental temperature on therapy outcomes is seldom considered, but as Dziuba⁶⁰ stated after one hippotherapy session: "...hippotherapy under conditions of lower temperatures does not fulfil its role." More research is needed to establish the effect of the physical environment and various temperatures on the outcome of the therapy.

4.5.4 Activity requirements

There exists a difference in how the different therapy professions define activities, but OTs, PTs and SLPs have treatment goals, their activity have certain characteristics, horse breed and size might be considered as well as dosage.

4.5.4.1 Treatment goals

Although treatment goals are more comprehensive than study outcomes, the study outcomes of the scoping review focused on the improvement of body function and structure, and activities that can lead to overall improved quality of life. According to Wood and Fields,³ the study outcomes have diversified over the past 30 years to include body functions and structures as well as activity participation (although still to a lesser degree).³

4.5.4.2 Activity characteristics

Activity characteristics can be detached from the movement of the horse, the positions of the clients and the ground courses that are taken, however, all these concepts form a critical part of hippotherapy. Some of the scoping documents equate the equine movement, the activity and ground courses (walking up hill). When describing activities, the movement of the horse, exercises (stretching forward) and sport-related activities (placing rings on poles) were mentioned more often than any other activity. Most studies had PTs as hippotherapy providers, and the term "activity" is differently used among different professionals. Less often mentioned, activities addressed fine motor aspects, cognitive games, communication and tactile stimulation. More research on how different activities contribute to reaching therapy goals within each profession can benefit from further research.

4.5.4.3 Horse breed

Horse breeds were not mentioned often (n=6) as the focus within hippotherapy is on the kind of movement rather than the horse breed that provides it.

4.5.4.4 Horse size

Some documents mentioned the horse and client match with regard to horse size,^{2,29,31,58,60,66-67,162} age,^{2,58,66-67} character^{2,31,58} (already discussed under therapeutic relations), conformation,⁵⁸ movement,^{29,31,58,66-67} condition of the horse² and the functional status of the participants.^{31,162} Two documents^{58,164} stated that the horse's stride needs to match the client's walking patterns. They said that some people may require a larger horse with a longer stride, and others may require a shorter horse with shorter, quicker strides.^{58,164} EATASA also advise that a horse expert might be consulted during the pairing process.² This researcher proposes that the height of the horse should both be described in relation to the height of the therapist as well as the actual height of the horse as working above shoulder height might have health implications for the therapist that provides the hippotherapy.

4.5.4.5 Horse movement

The movement of the horse is described as the main tool in hippotherapy in many hippotherapy definitions.³ The impact of the movement of the horse was also mentioned in the theoretical explanations of hippotherapy (Section 4.4.7.1 and 4.5.2.1) and may link to size of the horse when stride length is considered.

In this scoping review, horse movement was mentioned regarding the matching of the horse with the client and in 11 documents (21%) and the possible altering of movement by the service provider in 12 documents (23%). Wood and Fields³ found that the ability to alter the horse's movements during a hippotherapy session, was the second most commonly mentioned concept in their study.

4.5.4.6 Dosages of hippotherapy

Dosage was mentioned in 47 documents (92%) and included duration of session, frequency of sessions and total number of sessions. Yet, considerable dosage variations between

studies were observed. This might partly be attributed to the different functioning levels of participants as well as specifics within each study. On the other hand it is important to understand that hippotherapy is not a set programme and therapists using hippotherapy are highly-skilled individuals that will apply professional reasoning (not documented in these studies) in making decisions bearing each individual client's best interest in mind. More research is needed to determine the ideal dosage needed to achieve therapy goals.

4.5.5 Conclusion on identified hippotherapy concepts

By listing and describing 19 hippotherapy concepts, the different concepts that therapists should consider when setting up and executing a hippotherapy treatment plan for a client with spastic CP were highlighted. In addition, a research gap in the early phases of scientific development of hippotherapy as complex intervention was filled. Most of these concepts are gradable to ensure an individualised treatment plan for each client.¹⁴⁸ Therapists and researchers are encouraged to include each and every one of these concepts in treatments and studies and give the rationale behind decisions about these concepts. Such reasoning will allow more detailed research and comparison between studies. These concepts contribute to the understanding of hippotherapy and can also be seen as separate research topics to widen the scientific understanding of this complex intervention.

4.6 CONSULTATION WITH STAKEHOLDERS.

The sixth and optional step mentioned by Arksey and O'Malley¹⁴² is the consultation of stakeholders. In this study, stakeholders can be seen as all therapists across the world that use hippotherapy as treatment strategy. These therapists were consulted during the next phase of the study through qualitative questionnaires. The aim of the qualitative questionnaires was to explore current transdisciplinary hippotherapy practices in relation to the theoretical concepts found in the scoping review.

4.7 TRUSTWORTHINESS OF THIS SCOPING REVIEW

The quality of research of the included documents, was not assessed and therefore allowed a broad inclusion of studies to attain all the different hippotherapy concepts¹⁴⁴ and a description (when available) of the professional reasoning regarding the concepts used by therapists.

This researcher diligently followed the steps described by Arksey and O'Malley¹⁴² during the execution of this scoping review.

4.7.1 Credibility

The researcher was involved throughout the scoping review (prolonged engagement) from October 2019 to July 2020. Weekly online meetings with the supervisor and co-supervisor (peer debriefing and member-checking) were held to discuss each step of the scoping review and the progress that was made.

To identify the hippotherapy concept in step four (charting the data) the researcher documented each hippotherapy concept while reading through each research document. This reading was repeated three times throughout the scoping review process to ensure that all concepts were documented.

4.7.2 Dependability

Collating concepts (step five) was discussed in a face-to-face meeting with the supervisor and co-supervisor and documented in the written audit trail.

4.7.3 Conformability

Researcher bias was limited by listing every concept mentioned in the scoping documents and thus not deciding on inclusion or exclusion.

4.7.4 Transferability

This scoping review focused on hippotherapy concepts found in documents on clients with spastic CP. The identified concepts were found in 51 different documents. It is worth noting that no new concepts emerged after the 11th document was read and is thus applicable to spastic CP populations in different countries and settings. The applicability of the hippotherapy concepts to other diagnostic groups however still need further research.

4.7.5 Authenticity

This scoping review had an impact on the scientific development of hippotherapy as it is the first attempt to identify and describe hippotherapy concepts mentioned in literature. In the scientific development of complex interventions, describing concepts form part of the early

formulation of an intervention theory and, therefore, this scoping review is worthwhile and contributes to the hippotherapy field.

4.8 SUMMARY

This chapter described Phase 1 of this study, a scoping review, that included 51 documents from which 19 hippotherapy concepts emerged. These concepts were organised under four main treatment principles, namely: therapeutic relationships, activity requirements, presentation principles and structuring principles.

To undertake the scoping review five steps described by Arksey and O'Malley,¹⁴² were implemented and the sixth step was implemented during Phase 2 of the study. These five steps were to identify the research question, identify relevant documents, selection of documents, charting the data, and collating and summarising the results. The researcher did not only describe how each of these steps were implemented but also described the deductive and inductive reasoning followed during the application of each step. A discussion on the results (not one of the steps described by Arksey and O'Malley¹⁴²) were added to this chapter before the trustworthiness of the scoping review was discussed.

This clear mapping and organising of 19 hippotherapy concepts, directly contributed to the construction of questionnaires used to explore current transdisciplinary hippotherapy practices and the development of hippotherapy practice guidelines within Phase 2 of the study that will be described in Chapter 5.

CHAPTER 5

EXPLORATION OF HIPPO THERAPY PRACTICES AND GUIDELINE CONSTRUCTION - PHASE 2

5.1 INTRODUCTION

This chapter describes Phase 2 of the study, namely the exploration of hippotherapy practices (objective two) and the construction of the guideline statements (objective three), as illustrated in Figure 5.1. Within the scientific development of a complex intervention, Skivington et al.³⁸ call this process “the identification of intervention mechanisms”. Knowledge of hippotherapy’s intervention mechanism will contribute to future hippotherapy theory creation.

This guideline development step, which involved a guideline development group, was adhered to by involving OTs, PTs and SLPs from different countries to complete the questionnaire. As there are limited evidence in literature, participant’s written experience, as given in by them in the comments sections of the questionnaire, was combined with the information gathered in the scoping review to formulate guideline statements.

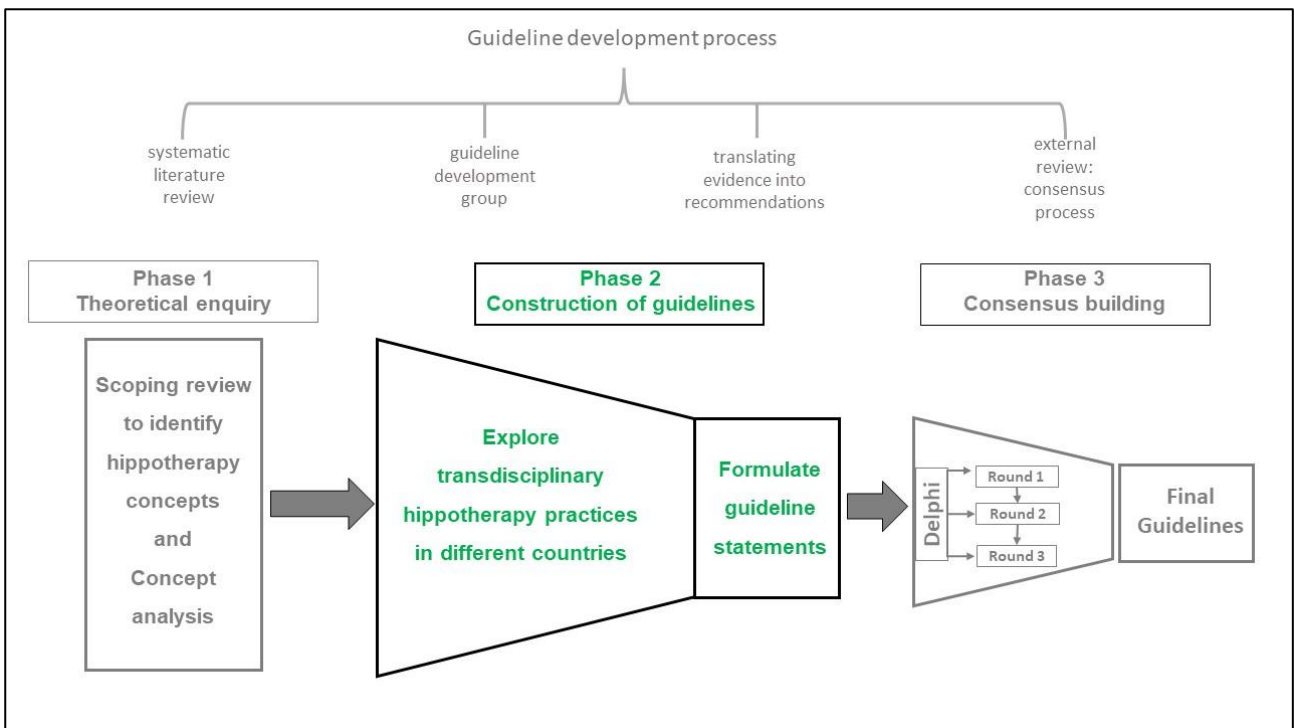


Figure 5.1: Phase 2 in the context of the study

It is important to understand that the questionnaire, which was divided into two parts, was a novel approach that harnessed the strengths of both the quantitative and qualitative questionnaire as well as the qualitative interview to explore the depth of hippotherapy practices in different countries. The purpose was to gain an understanding of how and why experienced therapists using hippotherapy, employed the hippotherapy concepts, as identified in Phase 1, in the treatment of spastic CP clients.¹³²

In this chapter, the researcher firstly declares her positionality applicable to this phase of the study, followed by the methodology for developing and piloting questionnaires. Details on the administration of the questionnaires, the analysis and the findings thereof, are then discussed. The methodology to organise the findings and combine it with information from Phase 1 into guideline statements, is given. Lastly, the researcher discusses the trustworthiness of these guideline statements followed by a discussion of the guideline statements.

5.2 POSITIONALITY IN PHASE TWO

In Chapter 3, the researcher described her pragmatic philosophical stance and gave a lengthy positionality statement. Although none of that has changed, it is important to realise that within this phase of the study, her role was to assemble all the inputs from participants into hippotherapy practice guideline statements. She perceived and treated the participants as the guideline development group of the study and deliberately took an outsider stance, while still acknowledging her insider perspective as hippotherapy practitioner. She also communicated her stance, that participants were selected due to their experience and that their contributions are valued, to the participants via email.

5.3 METHODOLOGY TO DEVELOP THE QUESTIONNAIRES

A qualitative, exploratory, descriptive, contextual research design was used to fulfil objective two and three of the study as described in Chapter 3.

Objective two explored transdisciplinary hippotherapy practices for clients with spastic CP through the involvement of hippotherapy practitioners. For this exploration, a novel approach was developed that combined both quantitative and qualitative questionnaire formats with interview analysis strategies. A series of statements and questions about each hippotherapy

concept was presented to the participants regarding three topographical classifications of clients with CP on different GMFCS levels.¹⁷⁴ Comments on each question were encouraged. This led to such a lengthy questionnaire that it was divided into two separate documents. The order of presentation of the two documents to each participant was randomised to allow for drop out or less detailed answers, should fatigue set in.

Conventionally a questionnaire is seen as a form of quantitative research,¹³⁷ where participant responses are interpreted by counting similar or identical responses and then evaluating these quantitatively.¹⁷⁴ Whenever a qualitative questionnaire was implemented, it conventionally consisted of only a few open-ended questions.¹³² Describing all responses from all participants was important in this study, as there was little known about the implementation of hippotherapy concepts into hippotherapy practice. A qualitative design was thus implemented, by describing the responses and thematically analysing comments.¹³² For this thematical analysis of comments the following steps were implemented: reading and familiarisations of the comments, complete coding to describe the essence of each comment, searching of themes, reviewing the themes and defining and naming of the themes.¹³²

To summarise, for objective two, the practical aspects of hippotherapy, across and beyond disciplines and countries, were explored through qualitatively analysed questionnaires. This exploration was done, and the results described, to broaden the knowledge base on hippotherapy with new insights and ideas generated from the experienced therapists.

For objective three, practice guidelines for transdisciplinary hippotherapy were constructed by integrating the information gathered in the scoping review and the questionnaires, through a process of operationalisation. Operationalisation is the process of explaining concepts and turning them into measurable empirical observations.¹⁷⁵

During the formulation of guideline statements, each hippotherapy concept was considered separately, the themes from the analysis process and the themes from the scoping review were reviewed and defined and then translated into guideline statements in the present tense. These statements were then presented to the expert panel in the first Delphi round of Phase 3 (Annexure J).

5.4 QUESTIONNAIRE DEVELOPMENT STEPS

The Food and Agriculture Organization of the United Nations developed nine design principles (steps) for questionnaire development in 1997¹⁷⁶ that was used in this study and supplemented by more recent literature.

5.4.1 Preliminary Considerations

For this study, the decision to use a questionnaire format was debated at length among the researcher and her supervisors. The following preliminary considerations¹⁷⁷ preceded the questionnaire development:

- Qualitative questionnaires are well suited for understanding practice and experience.¹³²
- It allows participants more flexibility to stop the process, think about answers or take a break, and then come back to the questionnaires at their own convenience to complete it.¹³⁷
- It saves time as all the questionnaires can be distributed at the same time and completed in the same time frame.¹³²
- No coordination of schedules between the researcher and participants is needed.¹³⁷
- Writing the answers focuses the participant's attention on the specifics asked about the hippotherapy concepts, thus generating more focused data to analyse.¹³⁷
- It avoids common pitfalls in interviewing while still gathering the same information. One of these pitfalls might have been, competing distractions in the participant's environment as the interviews would have been online.¹³⁷

5.4.2 Step one: Decide on the information to be obtained

The information to be obtained from the questionnaires had to be exact and clearly defined.^{174,176-177} This permitted a limited number of questions that were focused to obtain the needed information on each of the hippotherapy concepts that was identified in Phase 1 of the study.¹⁷⁷ It was also recommended that colleagues be consulted to assist in this process of deciding on the information to be obtained, which the researcher did by involving the supervisors of the study.¹⁷⁷

The aim of Phase 2 was to gather information on “what and how hippotherapy is done” in the “real world” when treating clients with spastic CP. To ensure the information contained in the guidelines is practical and relevant, the spastic CP population was further divided by combining a topographic classification^{36,40} and the GMFCS³² into the following groups:

- Clients with diplegia, where the lower limbs of the client are more affected than the upper limbs,³⁶ on GMFCS levels I, II and III.
- Clients with diplegia on GMFCS levels IV and V.
- Clients with hemiplegia, where one side of the body is more affected than the other side of the body,³⁶ on GMFCS levels I, II and III.
- Clients with hemiplegia on GMFCS levels IV and V.
- Clients with quadriplegia, where all four limbs are affected,³⁶ on GMFCS levels I, II and III.
- Clients with quadriplegia on GMFCS levels IV and V.

Questions were asked about the use of each of the 19 hippotherapy concepts when treating clients with spastic CP in each of these combined topographical and GMFCS levels.

5.4.3 Step two: Define the participants in the study

The participants of this study were OTs, PTs and SLPs from different countries using hippotherapy as treatment strategy.¹⁷⁶

By including therapists from various countries broadened the knowledge pool and diversity of hippotherapy during these early stages of scientific development of hippotherapy as intervention. The participants in this phase also fulfilled the role of a guideline development group in the guideline development process (Figure 5.1). The researcher decided on the following inclusion and exclusion criteria for participants.

5.4.3.1 Inclusion criteria

- OTs, PTs and SLPs from different countries, using hippotherapy as treatment strategy.
- Participants must have at least a three-year degree within one of these three professions.

- Participants must be registered by the mandatory health professional council of their country.
- Participants must have attended a post-graduate hippotherapy course that is recognised by either the hippotherapy association and/or the health professional council of their country.
- Participants must have treated clients with CP by using hippotherapy as treatment strategy within the previous year.
- Participants must have indicated willingness within the demographic information form to complete the hippotherapy questionnaires.
- Participants must be able to read, write and speak English.

5.4.3.2 Exclusion criteria

- Therapy assistants.
- People claiming to use hippotherapy but are not registered with their country's health professional council in any of the above-mentioned professions.
- Therapists who did not treat clients with CP within the previous year

Figure 5.2 illustrates the full participant selection process to provide an understanding of who the participants were that were invited to take part in the study and how they were selected for Phase 2.

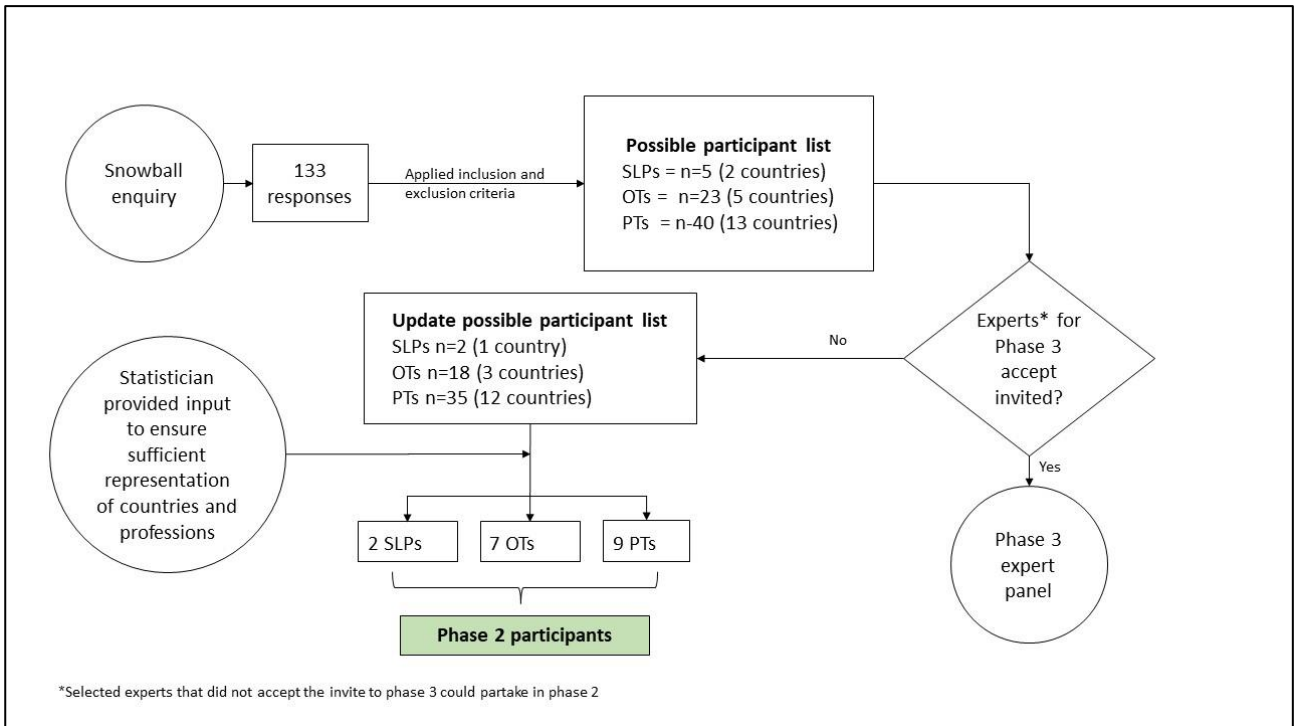


Figure 5.2: Participant selection

5.4.3.3 Identifying the population

A snowball enquiry was used to identify the population.¹³⁷ Although countries such as the United States of America and Australia have comprehensive lists of therapists who use hippotherapy as treatment tool or lists of treatment centres, no collective, all inclusive, international lists exist. Therefore, the broader population of therapists, that might fit the inclusion criteria of this study were unknown and a non-probability snowball enquiry was used.¹³⁷

Firstly, an e-mail (Annexure K) with information was sent to all the known hippotherapy associations explaining the study and asking them for contact details of their members that were on lists that were publicly available without confidentiality restrictions. These associations were asked to inform their member-therapists about the study and ask them if they are interested to take part in the study, so that diversity could be obtained. Secondly, a demographic information form (Annexure L) accompanied by an information and informed consent form (Annexure M) were sent to the members of these organisations, asking them

to provide publicly available contact details of their colleagues that use hippotherapy as treatment strategy or ask colleagues to contact the researcher. Thirdly, an explanatory e-mail containing information on the study and the information form to be completed (same as in Annexure J) were sent to all therapists on hippotherapy address lists available on the internet.

This snowball enquiry continued until no new names of therapists were added to the list. Although many more emails were sent, only 133 responses were received. After a population list was compiled through this snowball method, sampling according to inclusion and exclusion criteria started and produced a list of five SLPs from two countries, 23 OTs from five countries and 40 PTs from 13 countries, as illustrated in Figure 5.2. Each therapist received a possible participant number to ensure quasi-anonymity of participants as their names were only known to the researcher.

5.4.3.4 Sampling method and sample size

Once all the possible participants were identified as described above, purposive sampling were used to:

- Include therapists from as many countries as possible.
- Ensure representation of the three professions (OT, PT, SLP).
- Select the most experienced therapists in both using hippotherapy and treating clients with CP.

Therapists that fulfilled the inclusion criteria to take part in Phase 3 (Section 6.4.2.1) and serve on the expert panel had to be identified first and removed from of this list of possible participants for Phase 2. Possible experts were identified and invited to serve on the expert panel, but those that declined the invitation or did not respond, could still partake in Phase 2, should they wish to. The list was then updated and two SLPs from the same country, 18 OTs from three countries and 35 PTs from 12 countries were listed by participant numbers on the updated possible participant list.

Lastly, a statistician was consulted to ensure sufficient representation of countries and professions. The statistician advised that both the SLPs that fulfilled the inclusion criteria

should be invited. The OTs that fulfilled the inclusion criteria came from only three countries namely South Africa (n=3), the United States of America (n=13) and the United Kingdom (n=2). The statistician advised that not more than three OTs from one country should be included up to a total of seven. For the larger PT-pool, it was decided to rank them from the most to the least experience but only to invite one per country and not to invite more than nine PTs as to keep the ratio between OTs and PTs representative.

When any selected participant declined the invitation to take part in the study or did not respond after at least three follow-up emails, the next person on the list was contacted, provided that the representation between number of countries and professions did not change and that it was still within the time frame of Phase 2 of the study.

The return rate and demographics of the participants are described in section 5.5 and then illustrated in Table 5-1. Six OTs and five PTs from six countries completed at least one of the two questionnaire documents.

5.4.4 Step three: Choose the method(s) to reach the participants

The qualitative questionnaires were created in Qualtrics, which is an online survey tool that has no limitations on the number of questions that might be asked or responses that might be received back (in the licensed version),¹⁷⁸ which was chosen to reach the participants.¹⁷⁶ Qualtrics questionnaires are easy to create and it provides free access to view and download the raw survey data.¹⁷⁸ The questionnaire links were sent to the participants via e-mail.

5.4.5 Step four: Deciding on the content of the questions

To decide on the content of the questions^{132,176} the researcher carefully considered the information gathered from the scoping review, in Phase 1, and the kind of questions that was needed to retrieve the desired information lacking on each concept.¹⁷⁷ In other words, the researcher asked herself: “What do I already know?” and “What do I really want to know?”

Concepts that were described in more detail in the scoping documents, led to more specific and often closed-ended questions. For example, the physical environments mentioned in the scoping documents were listed in the questionnaire and the participants could mark the environments that they prefer. They also had the option to add and describe any

environment that was not listed. Concepts that lacked details led to more open-ended questions. For example, limited information was given in the scoping documents on the desired temperament of a hippotherapy horse and the question that was formulated was: “Describe your professional reasoning, how you decide, when pairing a therapy horse with a client, regarding the temperament of the horse.”

To structure the enquiry, each identified hippotherapy concept was treated as a separate topic. Furthermore, a case study strategy of inquiry¹²⁶ was added and used to explore transdisciplinary practices in depth across different CP categories. Detailed information was collected on each combined topographical and GMFCS level (Section 5.4.2) of clients with spastic CP.¹⁷⁹ To accomplish this strategy a brief description of each topographic classification (quadriplegia, hemiplegia and diplegia) was given in the questionnaires before the questions on each concept followed. Figure 5.3. is an example of how a set of questions were introduced to the participants.

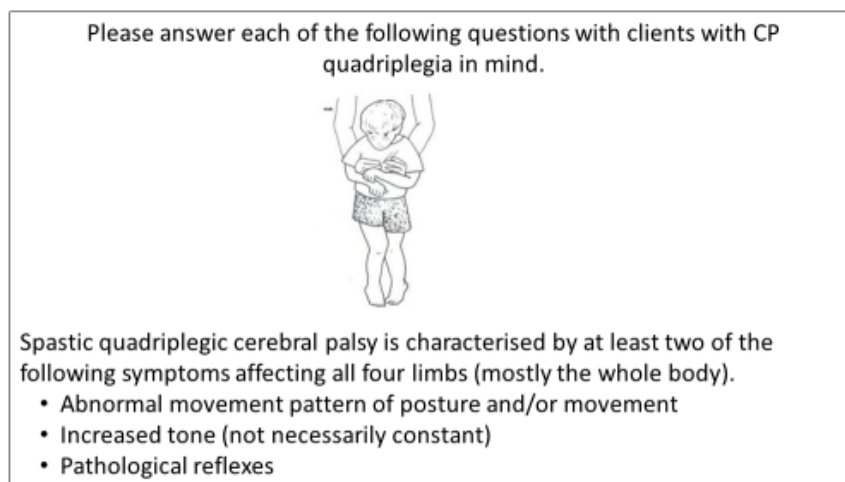


Figure 5.3: Example of topographic classification as case study

Following the description, the answers to questions then needed to be applicable to a “typical client with CP-quadriplegia” in relation to GMFCS levels I-III and again for GMFCS levels IV-V. The same strategy was repeated for clients with CP-hemiplegia and CP-diplegia.

5.4.6 Step five: Formulate the wording of the questions

To generate and refine the wording,^{174,176} the researcher first focused on describing the content that was needed as explained above, and secondly on wording used in the scoping documents and associated literature.¹⁷⁴ Lastly, the questions were asked to therapy colleagues that were excluded from the study, but are still knowledgeable about hippotherapy, to verify that the meanings of questions were indeed clear.¹⁷⁴

To assure content validity, the researcher consulted with the supervisor and co-supervisor before and after the pilot study was done.¹⁷⁴ Wording of questions were one of the aspects that the pilot study (step eight) focused on.

5.4.7 Step six: Meaningful ordering and formatting of the questions

To organise and format the questions^{174,176} they were ordered under four main categories. In the first category questions that apply to all three topographic classifications, such as the qualifications that hippotherapy providers need and the temperament of the therapy horse, were asked. Questions were sometimes added to differentiate between groups, to ensure that possible differences between client classification groups were covered. An example is the follow-up question about horse temperament: “Does your reasoning differ between the spastic cerebral palsy groups (quadriplegia, hemiplegia, diplegia)? Please explain”.

Category one was followed by questions about the application of each hippotherapy concept when treating clients with CP in the quadriplegic (category two), hemiplegic (category three) and diplegic classifications (category four). The same questions were repeated in categories two, three and four for the different classification groups.

In each category, questions were ordered according to the four treatment principles, therapeutic relationships, presentation principles, structuring principles, and activity requirements (Table 4-3). Where applicable, questions were enhanced with pictures such as positioning of clients on horseback.

Lastly each question was asked with clients on GMFCS levels I-III and clients on GMCS levels IV-V in mind, and where applicable, table formats were used.

5.4.8 Step seven: Check the length of the qualitative questionnaire

At first, the qualitative questionnaire was developed to be completed in one session. The researcher completed the questionnaire to estimate the length,¹⁷⁶ and it took her about four hours to complete. Thereafter, it was decided to divide the questionnaire into two documents, to be sent separately to alleviate responder fatigue. Questionnaire one contained two sections. In section one, questions about aspects applicable to the larger spastic CP population was formulated and section two contained questions regarding clients with CP-quadruplegia. Document two, called questionnaire two, focused on how hippotherapy concepts were applied to clients with CP-hemiplegia and clients with CP-hemiplegia.

5.4.9 Step eight: Pre-test the qualitative questionnaire

Piloting the questionnaire was of utmost importance in the development process^{174,176-177} to identify questions that lacked clarity or were ambiguous.¹⁷⁴ The inclusion and exclusion criteria for pilot participants were set to closely resemble the inclusion criteria for the larger process of Phase 2.¹⁷⁴

5.4.9.1 Inclusion criteria for pilot participants

- OTs, PTs and SLPs must be familiar with hippotherapy as treatment strategy.
- Pilot participants must have at least a three-year degree within one of these three professions.
- Pilot participants must be registered by the health professional council of their country.
- Pilot participants must have attended a post-graduate hippotherapy course that is recognised by either the hippotherapy association and/or the health professional council of their country.
- Pilot participants must have treated clients with CP within the past year.
- Pilot participants must have indicated willingness to take part in the pilot study.
- Pilot participants must be able to read, write and speak English.

5.4.9.2 Exclusion criteria for pilot participants

- Therapy assistants.
- People claiming to use hippotherapy but are not registered with their country's health professional council in any of the above-mentioned professions.

Firstly, two therapists, who fulfilled the inclusion criteria, were selected to pilot the qualitative questionnaire to establish face validity. One participant was a PT, the other a SLP. Both pilot participants did EATASA's hippotherapy course and are experienced in treating clients with spastic-CP. Secondly these therapists evaluated the questionnaires in table format regarding content and comprehension (Annexure N). They received an information letter and provided informed consent at the start of the questionnaires (Annexure N).

The pilot study was launched on 27 August 2020 and the final feedback was received on 8 September 2020. The researcher followed up on the pilot responses via telephone to discuss possible changes to the questionnaires before implementing these changes. In depth discussions were held on word choices and implications, and about meaningful ordering of questions.

5.4.9.3 Changes to the questionnaires

- To reduce the total number of questions, some questions were moved to the general first category, instead of repeating the same question for each topographical classification group. This decision was made where the different client classifications were unlikely to prompt different answers from participants and the question: "Does this differ between clients with CP-hemiplegia, diplegia or quadriplegia?" was added.
- Where questions were unclear or could be misinterpreted, it was changed. For example, under the movement of the horse section, questions about grading of gaits and transitions of the horse were clarified. It was also decided to add a separate question about "step length" because altering step length does not necessarily change the walking speed of a horse, as the original question unintentionally implied. Altering the step length can be used to add pelvic rotation (when you lengthen the horse's stride) or add more vertical displacement (when shortening the stride). The added question was: "When will you alter the step length of the horse?"

Another example is the question on dosage. The question was: “How frequently do you treat your clients?” As some therapists treat clients through multiple treatment strategies and settings, this question might be unclear and it was changed by adding the words: “... by using hippotherapy?”

- Spelling and typing errors were noted and rectified.
- Qualtrics settings that made completing the questionnaires more time consuming or confusing were changed, such as changing a “force response” setting to a “request response” setting. Qualtrics was also set to allow participants to change their choice of answer, should they wish to. The textbox for the question on pairing of a client with a horse was also changed to allow for longer text descriptions from the participants, should they wish to write paragraphs in response to the question.

After both supervisors approved these changes, the questionnaires were spell and grammar checked once more by an English first-language speaker.

5.4.10 Step nine: Construct the final questionnaire

After the process to develop the questionnaire, including piloting it, the final questionnaire and accompanying information letters were constructed.¹⁷⁶

In the study protocol that was approved by the Faculty of Health Sciences Research Ethics Committee of the University of Pretoria in 2019, it was stated that a questionnaire will be developed during Phase 2 of the study and then submitted for ethical approval. For this planned re-submission, the information letter accompanying the questionnaires was changed to make the participants aware that there were now two questionnaires to be completed. They were also informed that they will receive a participation certificate to be used for CPD purposes. In line with the protocol, the final qualitative questionnaires and information letter were submitted to the ethics committee and approved on 9 July 2020.

Thereafter, the final questionnaires were published on Qualtrics, ready to be sent out to the participants.

5.5 ADMINISTERING THE QUESTIONNAIRES

The participants of Phase 2 can be seen as the guideline development group of this study (Section 2.5.2.). They received the Qualtrics survey links to the two parts of the

questionnaire, via email, two weeks apart. From here on it will be called questionnaire one (Q1) and questionnaire two (Q2).

Both questionnaires were presented to all the participants but the order in which they received them were randomised. In Annexure O, both Q1 and Q2 are presented. Participants received either Q1 or Q2 (randomly assigned) on 14 September 2020 and three reminder emails every second week thereafter. The demographics of the participants and the order in which they received the questionnaires, as well as their response rate are illustrated in Table 5-1.

Although the original plan was to send the second questionnaire two weeks after the first (irrespective the order for each specific participant), the second questionnaire was only sent once the first one was received back. The data collection of this phase ended on 31 October 2020.

Seven therapists (OT=n5 and PT=n2) from four countries completed Q1. Ten therapists (OT=n5 and PT=n5) from six countries completed Q2. Phase 2 of the study, thus convey the opinions of a total of 11 therapists from six countries.

Table 5-1: Participant demographics and questionnaire return

Participants	Questionnaire one (Q1)	Questionnaire two (Q2)	Returned
Occupational therapists	OT no 1, from United States of America (sent first)	OT no 1, from United States of America (sent second)	Did not return Q1 or Q2
	OT no 2, from United Kingdom (sent first)	OT no 2, from United Kingdom (sent second)	Completed Q1 and Q2
	OT no 3, from South Africa (sent first)	OT no 3, from South Africa (sent second)	Completed Q1 and Q2
	OT no 4, from United Kingdom (sent second)	OT no 4, from United Kingdom (sent first)	Completed Q1 and Q2
	OT no 5, from South Africa (sent second)	OT no 5, from South Africa (sent first)	Completed only Q2
	OT no 6, from the United States of America (sent second)	OT no 6, from the United States of America (sent first)	Did not return Q1 or Q2
	OT no 7, from South Africa (sent second)	OT no 7, from South Africa (sent first)	Completed only Q1
	Replacement OT, from United States of America (sent first)	Replace OT, from United States of America (sent second)	Completed Q1 and Q2



	Replace OT, from United States of America (sent second)	Replace OT, from United States of America (sent first)	Did not return Q1 or Q2
Summary of completed questionnaires	Five completed from three countries (United Kingdom, South Africa and United States of America)	Five completed from three countries (United Kingdom, South Africa and United States of America)	
Physiotherapists	PT no 1, from Belgium (sent first)	PT no 1, from Belgium (received second)	Completed only Q2
	PT no 2, from Brazil (sent first)	PT no 2, from Brazil (received second)	Did not return Q1 or Q2
	PT no 3, from United States of America (sent first)	PT no 3, from United States of America (sent second)	Did not return Q1 or Q2
	PT no 4, from Denmark (sent first)	PT no 4, from Denmark (sent second)	Did not return Q1 or Q2
	PT no 5, from Greece (sent first)	PT no 5, from Greece (sent second)	Did not return Q1 or Q2
	PT no 6, from Peru (sent second)	PT no 6, from Peru (received first)	Completed only Q2
	PT no 7, from South Africa (sent second)	PT no 7, from South Africa (sent first)	Completed Q1 and Q2
	PT no 8, from the United Kingdom (sent second)	PT no 8, from the United Kingdom (sent first)	Completed only Q2
	PT no 9, from Canada (sent second)	PT no 9, from Canada (sent first)	Completed Q1 and Q2
	Replacement PT no 3 from United States of America (sent second)	Replacement PT no 3, from United States of America (sent first)	Did not return Q1 or Q2
	Replacement PT no 4 from Denmark (sent second)	Replacement PT no 4, from Denmark (sent first)	Did not return Q1 or Q2
	Replacement PT no 8 from Greece (sent first)	Replacement PT no 8, from Greece (sent second)	Did not return Q1 or Q2
Summary of completed questionnaires	Two from two countries (South Africa and Canada)	Five from five countries (South Africa, Canada, United Kingdom, Peru, Belgium)	
Speech and language pathologists	SLP no 1, from United States of America (sent first)	SLP no 1, from United States of America (received second)	Both incomplete
	SLP no 2, from United States of America (received second)	SLP no 2, from United States of America (sent first)	Both incomplete
Summary of completed questionnaires	None	None	

5.6 DATA ANALYSIS

An inductive reasoning process was used when analysing both open-ended and closed-ended questions in Phase 2 of the study.

A thematic analysis according to the six steps of Braun and Clarke,¹⁸⁰ were used to analyse the open-ended questions and comments from the participants. Care was taken to preserve unique answers, but similar answers were collapsed to lessen the amount of data.¹³² The researcher separately analysed each answer given in relation to each of the 19 hippotherapy concepts and CP classification groups. A non-numerical descriptive analysis¹⁸¹ was done on the closed-ended questions as all the answers were taken into consideration and described in the initial guideline statements to fulfil objective three.

5.6.1 Transcription

As qualitative questionnaires were used instead of verbal interviews, answers were already written, and no transcribing was needed.

5.6.2 Reading and familiarisations

In this step, the researcher became familiar with the content of answers in relation to each hippotherapy concept. In essence, it means that the researcher read and re-read the data. Thereafter, the researcher read the data again while critically analysing the words and deliberately considered the meaning thereof.

5.6.3 Coding across entire dataset

In this study, complete coding was used.¹³² Brief phrases describing the essence of relevant answers were used when describing the use of a hippotherapy concept regarding a specific CP classification and/or GMFCS level. Thus, all the data that was relevant to each question within the qualitative questionnaires was coded. Coding was used for open-ended questions and comments from participants.

5.6.4 Searching for themes

Themes are broader than codes, are multi-faceted and need to have a central organising concept to them.¹⁸⁰ Hippotherapy concepts, such as the temperament of the horse and treatment goals for each spastic CP classification needed an active process, where the

researcher examined and analysed the codes for patterns and then named each theme under the broader theme of that specific hippotherapy concept. These themes and the implications thereof in guideline formulations were discussed with the supervisor and co-supervisor in weekly meetings.

Other hippotherapy concepts, such as the size of the horse and dosage, were already organised in themes in the questionnaires that originated from the scoping review. Despite themes already existing, new themes were added to some concepts when they emerged. An example of this is seen under the hippotherapy concept of dosage. The themes that originated from the scoping review were “total number of sessions”, “frequency of sessions” and “duration of each session”. During the analysis process the new theme of “discharge criteria” emerged and the total number of sessions changed to “total number of sessions before re-evaluation”.

Another example is that under the hippotherapy concept “movement of the horse” the question was: “Which of the following gaits and transitions will you use during early therapy sessions (sessions 1-5)? Rank them in order of use, within each session by typing 1 (used first) and 2 (used second) and so on.” A list then followed. During the analysis process it became apparent that gaits such as a “slow walk, medium walk, fast walk, slow trot, medium trot and altering the step length of the horse” in combination with transitions such as “transition from stand to walk to stand or transition from stand to walk to trot, to walk to stand” caused confusion in the participants. Therefore, answers regarding gait were separated from answers regarding transitions. After separating these answers clear grading patterns emerged that were then used in the guideline statement development.

Furthermore, a clarification email was sent to participants regarding the use of the horse’s movement for the facilitation of pelvic movement in the client. The original question was: “What kind of movement of the horse do you prefer for a client with CP-quadruplegia GMFCS levels I-III?” Options were: “anterior/posterior movement, lateral movement, rotational movement or vertical displacement (bounce)”. From the answers given by the participants it was clear that there was confusion between the movement of the horse’s pelvis and the movement that was facilitated in the pelvis of the client and that clarification was needed. After a discussion with the supervisors, the researcher also realised that the professional

reasoning that the participants followed when deciding on the desired movement was needed in guideline formulation.

In the clarification email, the following were asked: “Regarding the desired pelvic movement, please tell me what professional reasoning do you follow when deciding on the order of pelvic movements facilitated in the client, first, second, third and so on, through the horse’s movement? For instance, why did you decide to facilitate anterior-posterior movement in the client’s pelvis before lateral movement, followed with rotation? You gave your own order to this question, but I am interested in your professional reasoning in this regard.”

The answers to the email were then thematically analysed and incorporated into the guideline development process.

5.6.5 Reviewing themes

The process of reviewing themes can be regarded as a level of quality control that was implemented.¹⁸⁰ The codes and original data were revised, to make sure that they reflect all answers to each question. During this phase, similar themes sometimes “collapsed” and others split into two separate themes. During this phase an independent SLP (trained in hippotherapy) also reviewed the themes and then discussed her findings with the researcher before the researcher again discussed the reviewed themes with the supervisor and co-supervisor. Searching for themes, reviewing themes, and defining and naming themes became a cycle that was repeated several times throughout the research.

Lastly participants explained how they applied each hippotherapy concept to each separate classification group. During the analysis process, some answers were similar for more than one classification group, and therefore, “collapsed’ into only one guideline statement, this was done during this stage of the analysis process and then reviewed in the next stage.

5.6.6 Defining and naming themes

In this step, the researcher established what is unique and specific about each theme and started considering the details mentioned in the scoping review in relation to the themes that emerged from the qualitative questionnaires. As stated in the previous section, this was repeated several times. The researcher and independent SLP again went through the cycle of searching, reviewing and defining themes separately before discussing it in a

meeting. Then the process was repeated in a follow-up meeting with the supervisor and co-supervisor before the researcher proceeded to formulate guideline statements on each hippotherapy concept.

5.7 TRUSTWORTHINESS

As stated in Chapter 3 where the trustworthiness of the broader study was discussed, only trustworthiness as applicable to Phase 2 of the study will be mentioned here.

Authenticity is applicable to this phase of the study and was not addressed in Chapter 3. It refers to what is real, genuine or true in how the participants use the hippotherapy concepts when treating clients with spastic CP.¹⁸² To create authenticity when analysing the answers given by the therapist-participants, their answers were coded and themed as close to the original words used by therapists, as possible. This closely linked to the credibility of the study that was also concerned with truth,¹⁴¹ as was discussed in section 3.5.1. Furthermore, therapist-participants were not influenced by group pressure and were free to express their own subjective opinion due to the qualitative questionnaire format that was employed leading to authentic answers, as described by Dammann et al.¹⁸³ Combining, but not negating any of their answers led to the construction of practical practice guideline statements specific to the spastic CP population.

The guideline statements were developed in a systematic and rigorous manner and each step was carefully documented to ensure reliability and reproducibility. This documentation formed part of the audit trail that was left throughout every phase of the study. The documentation of each step played a part in the transferability¹⁴¹ of the final guidelines that were developed in the next phase of the study.

The researcher and supervisors' collaboration throughout the analysis of the qualitative questionnaire were also documented to allow the process to be transferable to other studies and to ensure conformability.¹⁴¹ Conformability was further ensured by the independent hippotherapy-trained SLP that commented on the results (guideline statements) of each hippotherapy concept.¹⁴¹

5.8 FINDINGS

The product/findings of Phase 2 were 213 guideline statements. These guideline statements were used in the first Delphi round in Phase 3 of the study.

Table 5-2, shows a summary of the number of guideline statements that were formulated under each therapeutic principle for each hippotherapy concept.

Table 5-2 Number of guideline statements per concept at the end of Phase 2

Therapeutic relationships	Presentation principles	Activity requirements	Structuring principles
Hippotherapy providers 2	Theoretical explanation 12	Treatment goals 3	Ground courses 6
Hippotherapy human team members 7	Precautions 10	Activity characteristics 27	Manner of leading 4
Horse temperament 8		Horse breed 6	Poisoning 12
Physical handling of clients 13		Horse size 9	Horse tack and therapy equipment 19
		Horse movement 51	Physical environment 2
		Dosage 19	Temperature 3
30	22	115	46
213 guideline statements			

Regarding hippotherapy concepts under **therapeutic relations**, therapists did not have many varying opinions on the *therapists* providing the hippotherapy, other than stating that therapists need to be registered with the professional health and care council of their country and have done a post-graduate hippotherapy course. For the hippotherapy *team*, the focus

was on the composition and size of the team for various CP classifications. For all spastic CP groups on GMFCS levels IV-V a team of three people (therapist, side walker and horse handler) was suggested. For clients on GMFCS levels I-III, six different possible team compositions were suggested. Seven *temperamental traits* of a therapy horse were defined (themes that emerged) that were then translated into eight guideline statements applicable to the recommended horse temperament when treating the various CP classification groups. For *physical handling*, the emphasis in 13 guideline statements was on the hand placement of the therapist and side walker to both provide stability and facilitate movement.

Regarding **presentation principles** a list of possible *theoretical frameworks* applicable to hippotherapy emerged, as well as 10 guideline statements regarding *precautions*.

Guideline statements on **activity requirements** were more difficult to formulate due to the amount of information provided by the therapist-participants. For *treatment goals* the researcher translated every goal mentioned by the participants into ICF terms and then constructed a figure for the treatment of each topographic CP classification group, the guideline statement that was then formulated was: "To formulate treatment goals for clients with quadriplegia the following graph can be used." The same statement was given for clients with hemiplegia and diplegia, but the figure with body functions, structures, environmental factors and personal factors that might be included into treatment goals varied between the groups. In the questionnaires, the *activity characteristics* were presented to the therapist-participants as they were found in the scoping documents. Participants had to indicate what activity characteristics they applied when choosing hippotherapy activities for each CP classification group. This led to 14 activity characteristics of all clients on GMFCS levels I-III and eight activity characteristics for all clients on GMFCS levels IV-V. Clients with hemiplegia and diplegia on GMFCS levels IV-V, had another four activity characteristics to consider and clients with diplegia on GMFCS levels IV-V, yet one more. *Horse breed* as concept generated six guideline statements. The *size of the horse* not only influence the client but also the therapist, due to various ergonomic implications. Examples of ergonomic considerations are the position of the therapist's spine when walking beside the horse while supporting the client on the horse and the height that the therapist must work at. Therefore, the decision was made to present the size of the horse to the therapist-

participants in relation to the therapist's body. This led to a total of nine statements such as: "For clients on GMFCS levels I-III "... (a) the back of the horse is in line or at the same height as the therapist's waist." Or "... (b) the back of the horse is the same height as the therapist's chest." Another component regarding the *size of the horse* was the width of the horse and the influence thereof on the client.

The *movement of the horse*, also an activity requirement, created a large amount of information that was divided into the following themes: general movement consideration, horse gaits, repetitive transitioning between gaits, repetitive transitioning between gait speeds, step length of the horse and pelvic movement facilitation in the client. Within these themes, guideline statements were compiled for earlier therapy sessions (session one to five) and later therapy sessions (session six onwards). The guideline statements also considered each topographical classification in combination with the GMFCS of the client. The amount of information and the length of the descriptions used by the therapists, indicated the complexity of "*the movement of the horse*" as one of the identified hippotherapy concepts. It also highlighted the need for separate research and defining of the components of horse movement and the influence of each movement component on the client.

The last hippotherapy concept, under activity requirements, was dosage with guideline statements formulated for duration of sessions, frequency of sessions, total number of sessions and discharge criteria. There were also three guideline statements regarding the dosage of intensive hippotherapy block sessions.

Guideline statements on **structuring principles** started with six statements on *ground courses* that stated when ground courses with gradual bends (20 m circles, three loop serpentines, large figures of eight and gradual zigzags patterns) and sharper and smaller bends (10 m circles, five loop serpentines, smaller figures of eights and sharp zigzags) should be introduced to clients in different topographical classification groups and GMFCS levels. The *manner of leading* led to four statements only indicating what manner of leading therapists use in therapy but lacking research on how each manner of leading influences the hippotherapy horse and/or the client.

For the *positioning of the clients* on the horse various possibilities were given and illustrated with pictures. Two statements focused on what are not desirable namely that "modified side

sitting” is not recommended for clients with hemiplegia on GMFCS levels IV-V and another that “all fours facing backwards” is not recommended for clients with diplegia on GMFCS levels IV-V. Lastly two statements focused on when to introduce “all fours facing forward”.

The hippotherapy concepts on *horse tack* and *therapy equipment* were grouped together and led to 19 guideline statements. Although this was a natural grouping in the guideline statements, the two concepts should be studied separately in research, as the one concentrates on the tack needed by the horse, such as saddles and the influence thereof on the client and the horse. The other concentrates on the equipment needed by the client, such as a riding hat or pillows for support and the influence thereof on both the client and on the horse.

Lastly, the *physical environment* in which hippotherapy is conducted led to two guideline statements and the *environmental temperature* led to three guideline statements.

As stated above, the detailed guideline statements were presented to the expert panel in the first Delphi round and can be viewed by the reader in Annexure J.

5.9 DISCUSSION

In Phase 2 of the study, the questionnaire development was firstly described, followed by the construction of guideline statements. During the questionnaire development, the wording of the questions was influenced by the content of the scoping documents as well as the lack of content for some of the 19 hippotherapy concepts. The number of questions that were required to obtain the needed information, emphasised the complex nature of hippotherapy. It established hippotherapy as a complex intervention^{37,52} not just as a tool, although the movement of the horse as one hippotherapy concept can be seen as treatment tool.³ Or as Wood and Fields³ put it: “...hippotherapy, the term, indiscriminately encompassed equine movement as a circumscribed therapy tool plus comprehensive services that incorporated this tool but were not reducible to it.”

Eleven therapists acted as experienced informants that completed at least one of the two questionnaires, a number that is in line with the recommended 10 to 20 members of a guideline development group. This group was multidisciplinary, were experienced in hippotherapy, and was geographically representative of the therapists that completed the

snowball information form.¹² Many definitions of hippotherapy, listed by Wood and Fields,³ mention hippotherapy providers and hinted at their important role without details on the needed qualifications, training and contributions. Although this phase of the study did not concentrate on this neglected information about hippotherapy providers, it did develop two guideline statements about hippotherapy providers and, moreover involved, OTs, PTs and SLPs in the development process thereof. This study emphasises the need for future research on hippotherapy service providers and the skills and training needed by them to provide such a complex intervention. On a less formal level, comments made by two of the participants, in response to the researcher's thank you emails, were that taking part in the study motivated them for future hippotherapy after the COVID-19 pandemic and that such a study was long overdue.

Analysing the questionnaire responses and incorporating details found in the scoping review, led to the construction of guideline statements for possible hippotherapy practice guidelines. By tapping into the hippotherapy experience of therapist-participants, this phase of the study provided a glimpse into current hippotherapy practices across the world. It described the intervention mechanism of how change is caused and how the intervention is applied by three different professions. The researcher noted more similarities, in responses, than differences regarding most hippotherapy concepts. Yet a difficulty in describing how the movement of the horse contributes to reaching functional goals for the client was also noted. The different aspects of the movement of a horse (gaits, transitions between gaits, walking speed) and the influence of each on the client warrant more in-depth research as the movement of the horse is seen as the core therapy tool in hippotherapy. Other hippotherapy concepts that interlink with one another and the movement, such as ground courses and the position of the client on the horse, also have an influence on how the movement of the horse is translated to the client, making it difficult to theorise about one movement component and the effect thereof at any given time in therapy.

The complexity of hippotherapy and its interlinked concepts cannot be stated enough and again contributes to the notion that hippotherapy providers need post-graduate training before embarking on this complex intervention strategy.

5.10 SUMMARY

This chapter described Phase 2 of the study that first constructed the questionnaires and then developed initial guideline statements. The researcher described how the qualitative questionnaires were developed, administered and analysed. To follow a transparent guideline development process, as described by Rosenfeld, Shiffman and Robertson,¹³ as well as WHO,¹¹ considerable time was spent on formulating the questions in the questionnaires, as that largely affected the final recommendations. The “steering group” in this study (as mentioned in Chapter 2) consisted of the researcher, the supervisor and the co-supervisor.

According to both the WHO¹¹ and SIGN,¹² the 11 participants in Phase 2 of the study acted as a guideline development group and completed at least one of two qualitative questionnaires. The five OTs and six PTs from six different countries that completed the questionnaires gave information on how they use the 19 hippotherapy concepts when treating clients in three different topographic classification groups (quadriplegia, hemiplegia and diplegia) in combination with the GMFCS levels I-III and levels IV-V.

The analysis of the questionnaires then led to the development of 213 initial guideline statements that were presented to an expert panel in Phase 3 of the study. Chapter 6 describes Phase 3 that incorporated a modified Delphi technique to obtain consensus on the final guidelines.

CHAPTER 6

CONSENSUS PROCESS – PHASE 3

6.1 INTRODUCTION

A set of guideline statements were developed as described in Chapters 5 in the absence of relevant published information on how hippotherapy concepts are used. These guideline statements were aimed at clients in the different topographic classifications of clients with spastic CP when using hippotherapy as intervention.

This chapter focuses on Phase 3 – the consensus building process – as shown in

Figure 6.1. Phase 3 addressed objective four of this study namely: To obtain consensus from an expert panel on the transdisciplinary hippotherapy practice guidelines, using a modified Delphi technique.

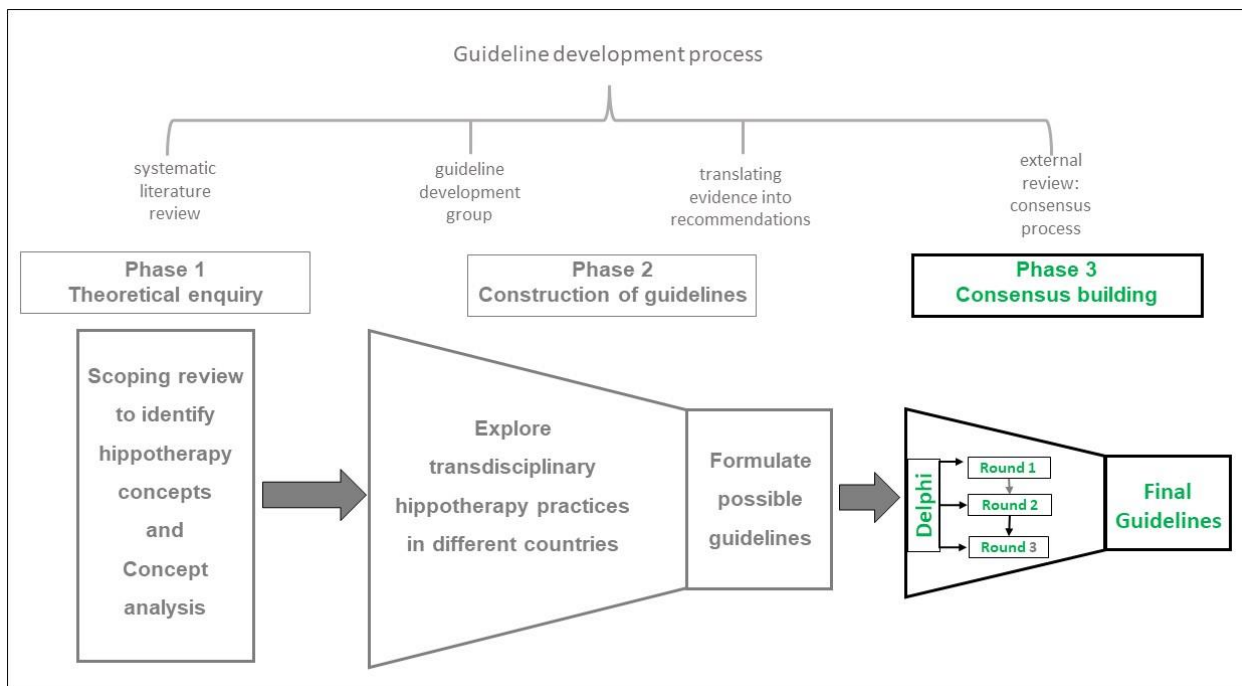


Figure 6.1: Phase 3 in the context of the study

In line with the Rosenfeld, Shiffman and Robertson's¹³ guideline development process (Section 2.5.2), this phase served as an external review, but also facilitated input from experienced OTs, PTs and SLPs from as many countries as possible in an impartial manner.

In this chapter, the researcher again declares her positionality and describes the ethical obligations applicable to this phase of the study. This is followed by a description of the modified Delphi technique and the analysis and results of each round.

Please note that the separately identified concepts of “horse tack” and “therapy equipment”, under structuring principles (Table 4-3), were presented together during the consensus process. This was done under the heading “tack and equipment” but were separated again in the final guidelines. After the third and last Delphi round, all the guideline statements that reached consensus on inclusion throughout the Delphi process, were called *guidelines*. After restructuring the new guidelines and collating some of them, there were 166 final transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

The trustworthiness of the Delphi technique is discussed in the discussion section of the chapter.

6.2 POSITIONALITY DURING THE MODIFIED DELPHI TECHNIQUE

Through her academic work, presenting lectures at hippotherapy courses and presenting at congresses, the researcher became more knowledgeable about the developing theory and practice in hippotherapy. She also became aware of differences between the professions when describing the use of hippotherapy concepts.

Regarding hippotherapy and having an informed opinion, she took an insider perspective.¹³¹ As “reporter” of the opinions of the expert panel, she took an outsider perspective¹³¹ by following a strict protocol of including every comment into the follow-up guideline statements or guideline clarifications, as was dictated by the study protocol. In Phase 3 the researcher assumed a dual stance with strict boundaries.¹²³

6.3 ETHICAL CONSIDERATIONS

The Delphi technique allowed for quasi-anonymity where the judgements and opinions of other expert panel members were known but the identity of the member who expressed it, remained strictly anonymous to all but the researcher.¹⁸⁴ Although their personal opinions will remain anonymous, their names (with their written permission), might be mentioned as contributors to the final transdisciplinary hippotherapy practice guidelines.

Taking part in the study was voluntary and the expert panel members were aware that they could withdraw from the study at any time, even though they were asked to commit to taking part in all three rounds of the Delphi technique.

At the beginning of each round, they had to indicate that they consent to take part before they could proceed with the questionnaires made available in Qualtrics.

6.4 METHODOLOGY

6.4.1 Design

A qualitative, exploratory, descriptive, contextual research design was used as described in Chapter 3.

6.4.2 Sampling method

Essential to the Delphi technique is a panel of experts who anonymously complete subsequent data collection rounds.¹⁸⁴⁻¹⁸⁵ In this study the expert panel consisted of 11 experienced OTs, PTs and SLPs. The process of how the expert panel members were identified and selected is depicted in Figure 6.2

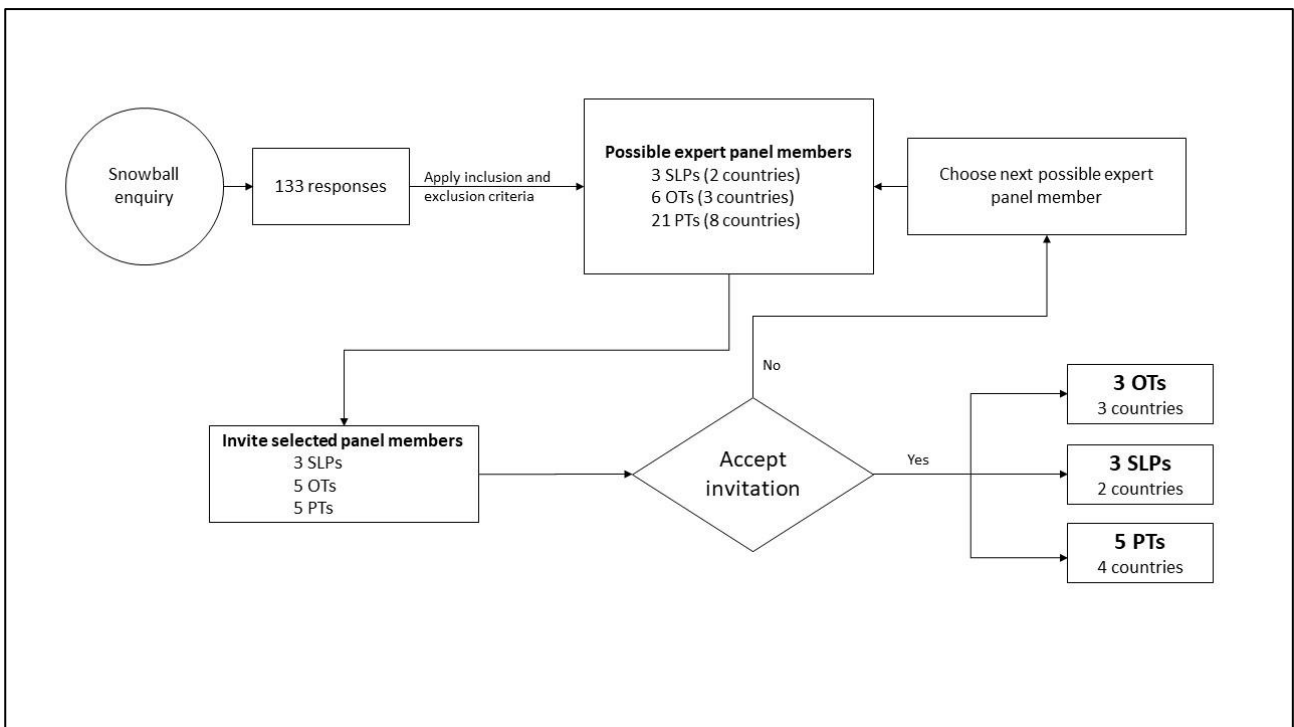


Figure 6.2: Selection of the expert panel

6.4.2.1 Inclusion criteria for expert panel members

- OTs, PTs and SLPs from different countries using hippotherapy as treatment strategy.
- Expert panel members must have at least a three-year degree within one of these three professions.
- Expert panel members must be registered by the mandatory health professional council of their country.
- Expert panel members must have attended a post-graduate hippotherapy course that is recognised by either the hippotherapy association and/or the health professional council of their country.
- Expert panel members must be able to read, write and speak English.
- Expert panel members must have at least three years of experience treating clients with CP in a clinical setting, not using hippotherapy as treatment strategy, for at least three to four hours per week.
- Expert panel members must have treated at least three CP clients per week using hippotherapy as treatment strategy within the previous year.
- Expert panel members must have indicated their willingness to serve on the expert panel.

As the required number of hippotherapy sessions excluded all the SLPs that completed the information form, it was changed to at least 2 hippotherapy sessions per week. Changing this one aspect led to the inclusion of three possible SLPs and one more OT. The PT list was left unchanged as the population that responded was big enough to comply with the original inclusion criteria.

6.4.2.2 Identifying the population

A process of purposive sampling was employed to select the therapists with the most experience in treating clients with CP, both in a traditional therapy setting and by using hippotherapy. Five OTs, five PTs and three SLPs from six countries were selected upon the

advice of a statistician. Any single country was not allowed to be represented by more than two therapists from the same profession to ensure a diverse, global representation. The countries were: Denmark, Canada, South Africa, the Czech Republic, the United Kingdom and the United States of America.

Therapists were invited via email to serve on the expert panel (Annexure C) on 3 July 2020. A follow-up email was sent on 20 July 2020 and again on 19 August 2020, if they did not respond. Therapists that accepted the invitation received a participant number and were informed that a Zoom on-line information meeting will be scheduled, once the third phase of the study commenced.

When invited therapists declined an invitation or did not respond in time, another therapist on the list was invited, provided that there were not already two therapists from the same profession and from the same country invited.

In August 2021, when this phase of the study commenced, there were five PTs, three OTs and three SLPs that served on the expert panel.

6.4.3 The Delphi technique

In this study, a modified Delphi technique was employed to achieve consensus on what guideline statements to include in the final transdisciplinary hippotherapy practice guidelines (Figure 6.3). This approach differed from the classic Delphi methodology.

In the classic Delphi methodology, open-ended questions are asked in round one that generate ideas and statements to be evaluated and commented on in the second round.^{184,186} In subsequent rounds, feedback on the responses in previous rounds are given to the experts and new comments and evaluations are requested.¹⁸⁴ The classic Delphi usually have two to four rounds.^{184,186}

In a modified Delphi, as described by Keeney, Hasson and McKenna,¹⁸⁴ the statements are generated beforehand from resources, such as literature or focus groups. The modified Delphi also asks that the expert panel evaluates and comments on statements and also gives feedback on the responses in subsequent rounds before requesting new evaluation.¹⁸⁴

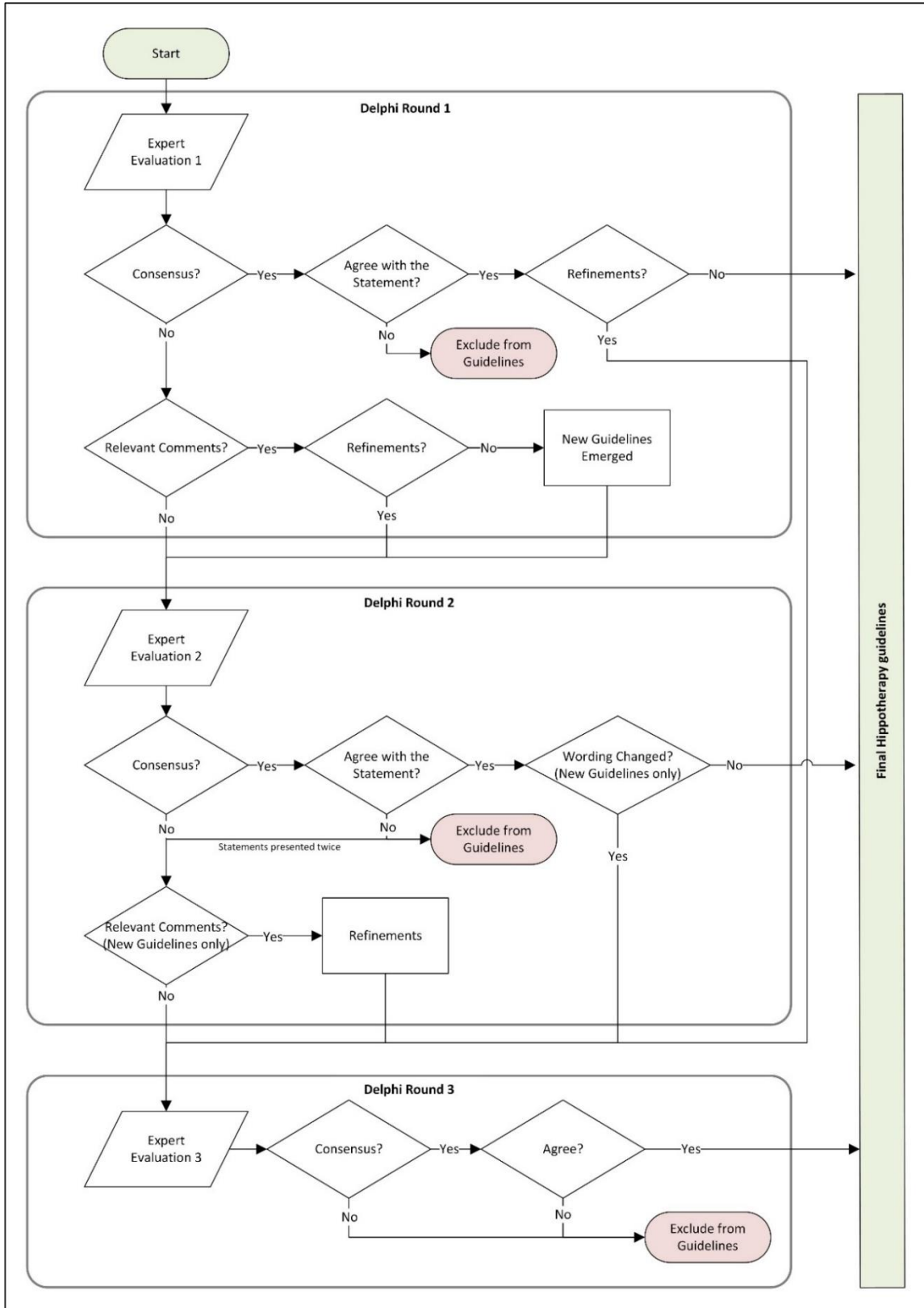


Figure 6.3: Phase 3 – Modified Delphi technique

The modified Delphi technique used in this study differed from the classic Delphi methodology in four ways that will be described in detail in section 6.5. and are briefly mentioned here.

Firstly, guideline statements were already generated during Phase 2 of this study, according to the guideline development process described in Chapter 5. Following this guideline development process,¹⁸⁷ transferability¹⁴¹ of the guidelines was enhanced and the number of Delphi rounds needed was reduced.^{184,186}

Secondly, in round one, aspects from a modified Delphi *were combined* with aspects of a classic Delphi by *encouraging comments* that solicited responses and generated new statements.

Thirdly, the decision was made to allow *two rounds* for each statement to reach consensus.^{186,188} This was done to limit panel fatigue and attrition.¹⁸⁴

Fourthly, round three *sought approval* for changes in wording or refinements, in accordance with expert comments. This allowed for peer review of the changes that were made to guideline statements, and enhanced the credibility of the final transdisciplinary hippotherapy practice guidelines.¹⁴¹

Before taking part in the study, the expert panel was informed that the Delphi technique will be done over three rounds. This allowed the experts to commit to a set number of rounds, set their expectations and supported time management.¹⁸⁶

6.4.4 Method of distributing each Delphi round

The responses from each Delphi round were collected through Qualtrics, software developed for online questionnaires. Qualtrics is suitable for an academic environment, as it has data protection settings, friendly interface, the ability to export raw data, no limit to the number of questions that can be generated, the start date can be set, can be customised, has easy integration with social networks, can be viewed on a mobile phone, multimedia can be uploaded onto the survey, and supports logic branching.¹⁷⁸

6.4.5 Level of consensus

The researcher pre-determined the level of consensus.^{184,186} Keeney, Hasson and McKenna found consensus levels that varied from 51% to 100% in different studies and concluded that the aim of the study might influence the level of consensus chosen by a researcher.¹⁸⁴ This study employed a modified Delphi technique with the objective to reach consensus on which guideline statements should be included into the final transdisciplinary hippotherapy practice guidelines. With this objective in mind, and due to the small expert panel size, the consensus level was set at 60% during the protocol development of this study, in consultation with a statistician.¹⁸⁴

6.4.6 Analysis of expert comments

Over and above the consensus analysis, the comments received in rounds one and two were analysed through explicit content analysis¹⁸⁹ and incorporated into subsequent rounds.¹⁸⁴ An independent SLP acted as a peer reviewer of new statements generated, word changes and refinements to statements. Her review enhanced the credibility of the analysis process and the construction of the subsequent Delphi rounds.¹⁴¹

6.5 APPLICATION OF THE MODIFIED DELPHI TECHNIQUE

Each expert panel member attended an individual Zoom meeting at the start of the process. It served as an information session and was intended to enhance return rates, as literature indicated a higher commitment from experts after face-to-face interviews.¹⁸⁴ Each expert then received a Qualtrics link to the first Delphi round and a personal participation number via email. The invitation to each round of the Delphi technique was accompanied by a cover letter and instruction sheet that can be seen in the at the beginning of each Delphi round.

The application of the modified Delphi, as illustrated in Figure 6.3 is described chronologically from round one to round three, starting in the following section. Under each round a diagram of that round, the method, analysis as well as the results are given.

6.5.1 Delphi round one

Figure 6.4 depicts the first round of the Delphi technique with the number of statements and findings.

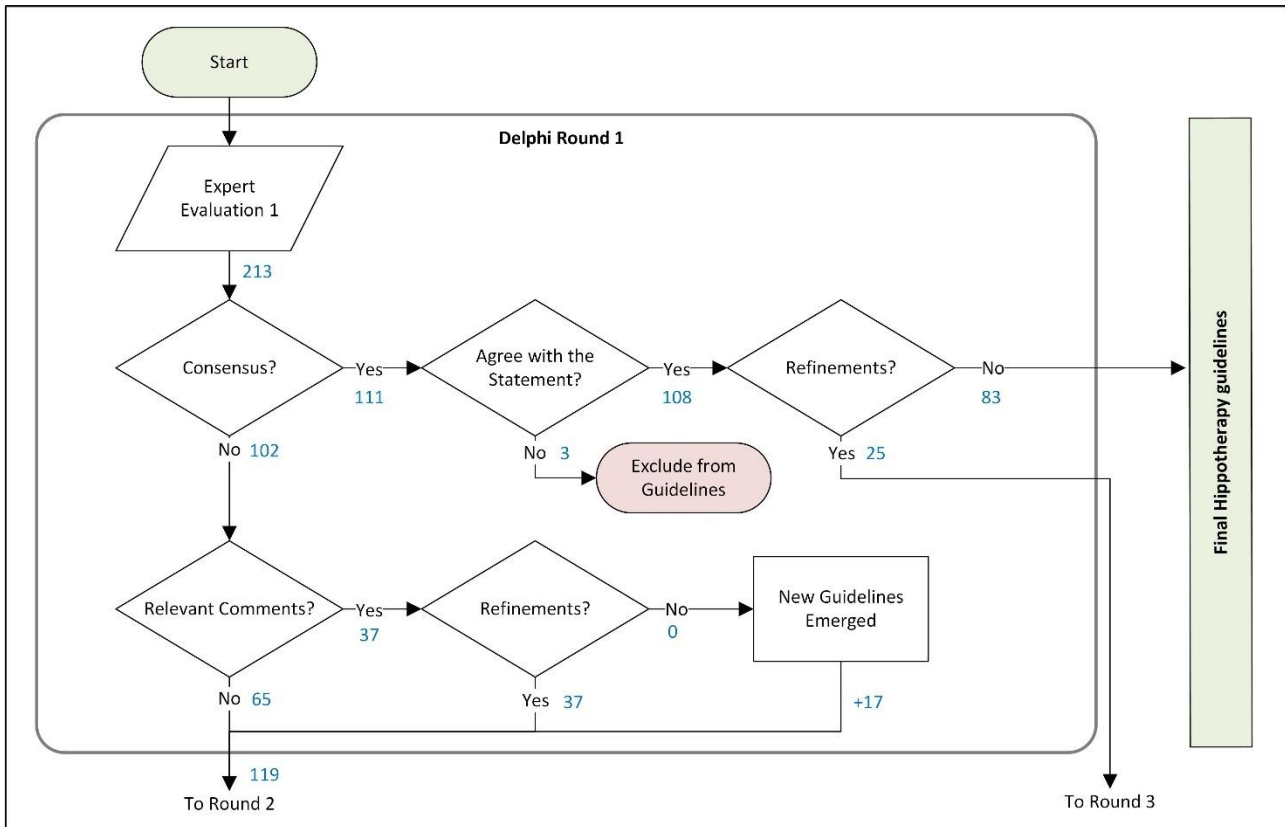


Figure 6.4: Delphi round one

6.5.1.1 Method used in round one

A total of 213 statements were presented to the expert panel in round one of the Delphi process (Annexure J). This included elaborations such as different hand placements of a therapist during therapy and different combinations of team members needed during a hippotherapy session. The expert panel had to evaluate each statement and each elaboration separately by choosing “agree”, “disagree” or “maybe”, on the inclusion of statements into the final transdisciplinary hippotherapy practice guidelines. After that, they were also asked to comment on the statements.¹⁸⁴

6.5.1.2 Analysis of round one

Responses from the expert panel were tabulated in a Microsoft Excel spreadsheet to calculate consensus and non-consensus items. Thereafter, these groups of responses were further divided as described under the results section of round one.

Comments from the expert panel were analysed for content and that led to refinement of some statements to be incorporated into the subsequent phases.¹⁸⁶ Some comments also generated new statements that were presented in round two.

6.5.1.3 Results of round one

Round one had a 100% questionnaire response rate and took each expert panel member more or less four hours to complete.

Round one led to input into five different output categories namely:

- Experts reached consensus on three statements to be *excluded* from the final guidelines (Annexure P).
- Experts reached consensus on 83 statements that were included in the final guidelines *without comments* that had to be addressed.
- Experts reached consensus on 25 statements *with comments* that had to be addressed.
- Experts did not reached consensus on 102 statements.
- Seventeen new guideline statements emerged from the comments.

The consensus level of statements that reached consensus on inclusion, both those that needed refinement and those without comments, are depicted in Table 6-1.

Table 6-1: Consensus rates for Delphi round one

Treatment principles		Statements regarding the use of hippotherapy concepts				
Consensus level for therapeutic relationship statements	Statements regarding therapists	Statements regarding human team members	Statements regarding horse temperament	Statements regarding physical handling		
	1.1 = 91% 1.2 = 91%	No consensus in round 1	3.3 = 82% 3.4 = 91% 3.5 = 100% 3.6 = 100% 3.7 = 82% 3.8 = 91%	4.1a = 64% 4.1b = 91% 4.1c = 82% 4.1d = 64% 4.1e = 64% 4.1f = 64% 4.2 = 91% 4.3. = 91% 4.4 = 82% 4.5 = 73% 4.6 = 82% 4.7 = 91%		



Treatment principles						
Statements regarding the use of hippotherapy concepts						
Consensus level for presentation principal statements	Statements regarding theoretical framework	Statements regarding precautions				
	5.1a = 64% 5.1b = 64% 5.1c = 82% 5.1e = 64% 5.1f = 73% 5.1i = 100% 5.1j = 91% 5.1k = 100%	6.1 = 82% 6.2 = 64% 6.3 = 64% 6.4 = 73% 6.5 = 82% 6.6 = 100% 6.7 = 82% 6.8 = 91% 6.9 = 64% 6.10 = 91%				
Consensus level for activity requirement statements	Statements regarding treatment goals	Statements regarding activity characteristics	Statements regarding horse breed	Statements regarding horse size	Statements regarding horse movement	Statements regarding dosage
	7.1 = 82% 7.2 = 82% 7.3 = 82%	8.1a = 64% 8.1b = 82% 8.1d = 73% 8.1e = 73% 8.1f = 73% 8.1g = 82% 8.1h = 100% 8.1i = 73% 8.1j = 82% 8.1k = 64% 8.1l = 91% 8.2b = 64% 8.2e = 100% 8.2f = 91% 8.2g = 73% 8.3b = 64%	9.1 = 64%	10.3 = 64% 10.5 = 100% 10.6 = 100%	11.1a = 64% 11.5a = 73% 11.6b = 73% 11.10a = 64% 11.10b = 82% 11.11b = 91% 11.11e = 64% 11.11f = 64% 11.12 = 64% 11.13 = 91%	12.1 = 82% 12.6 = 91% 12.7 = 64% 12.10 = 91% 12.14a = 64% 12.14c = 73% 12.14d = 100% 12.14e = 91% 12.14f = 100%
Consensus level for structuring principal statements	Statements regarding ground courses	Statements regarding manner of leading	Statements regarding positioning of the client on the horse	Statements regarding horse tack and equipment	Statements regarding physical environment	Statements regarding environmental temperature
	13.1 = 82% 13.2 = 82%	14.1a = 82% 14.1b = 73%	15.1a = 100% 15.1b = 73%	16.2 = 64% 16.4d = 64%	17.1 = 91% 17.2 = 73%	18.1 = 82% 18.2 = 91%

Treatment principles	Statements regarding the use of hippotherapy concepts					
	13.3 = 91%		15.1c = 64%	16.8 = 73%		18.3 = 64%
	13.4 = 64%		15.1d = 73%	16.10 = 73%		
	13.5 = 73%		15.1e = 82%	16.11 = 73%		
	13.6 = 82%		15.1f = 82%			
			15.1g = 82%			
			15.1h = 64%			
			15.2 = 64%			
			15.3 = 64%			

6.5.2 Delphi round two

Experts received feedback between the first and the second Delphi rounds on the three statements that reached consensus on exclusion and the expected dates for round two. The second Delphi round is depicted in Figure 6.5.

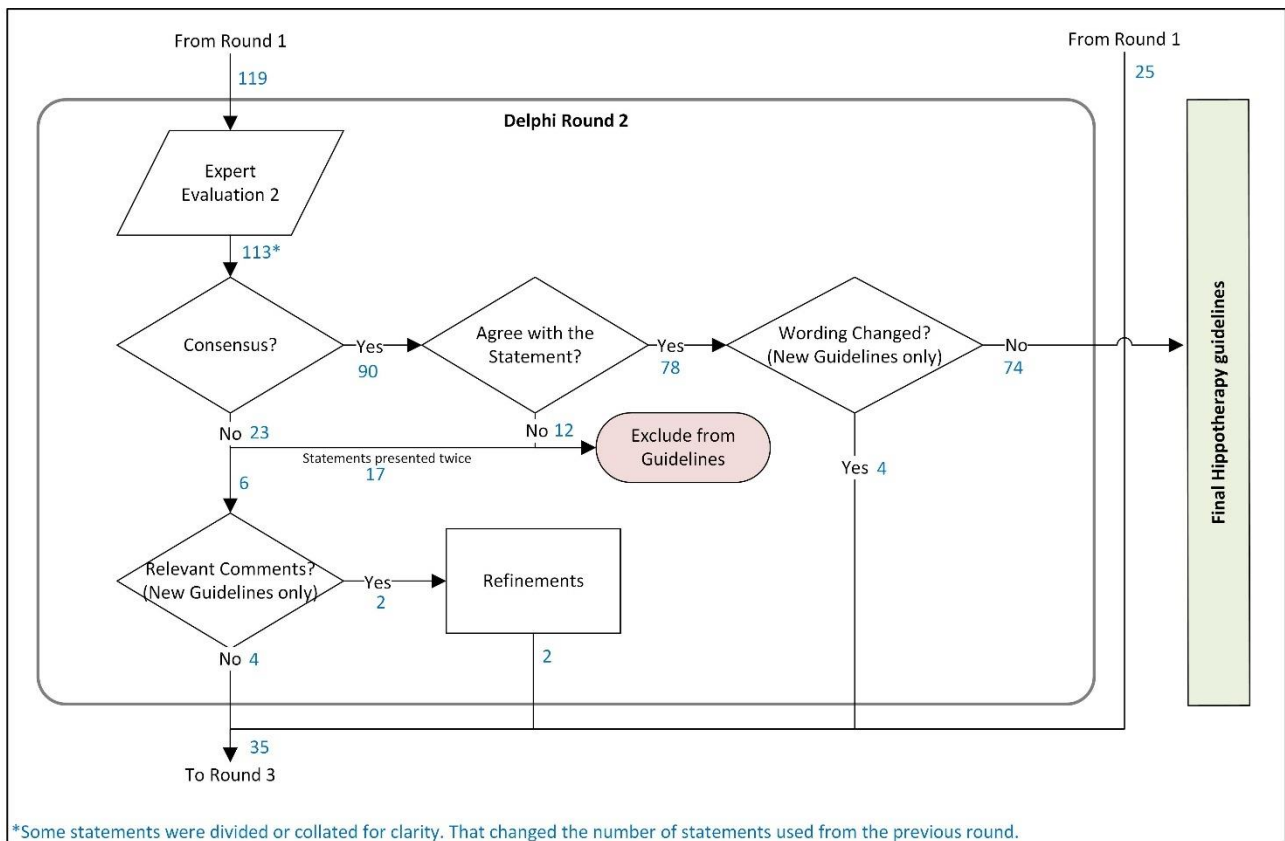


Figure 6.5: Delphi round two

6.5.2.1 Method used in round two

During the process of developing the second Delphi round, some statements or elaborations were collated in accordance with expert comments and others were separated to gain consensus on each part of the statement. Seventeen new statements were also presented to the expert panel in round two. The process how each statement evolved was documented in the audit trail. However due to this process, the numbers given in the result section of round one does not match the 113 statements presented to the expert panel in round two.

The categories of statements that were included in the second Delphi round (Annexure Q) were:

- New statements that were generated from expert comments in the first round. The new statements were presented to the experts for consideration in the same manner than the round-one statements. Experts could again indicate “agree”, “disagree” or “maybe” and could comment on any of these new statements. This was seen as the first Delphi round for these statements.
- Statements that did not reach consensus in round one were presented again, with feedback on the group response. Feedback was also given on how expert comments were addressed. For some statements, the expert comments led to word changes, refinements to the statement or adding definitions to the statements. Experts were asked to consider the feedback and indicate whether they “agree” or “disagree” that the statement should be included into the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

6.5.2.2 Analysis of round two

Responses from the expert panel were again tabulated in a Microsoft Excel spreadsheet. New statements followed the same process as described in round one.

Statements that were presented for the second time, with feedback, were also tabulated to calculate consensus and non-consensus. Statements that reached consensus became guidelines to be included into the final transdisciplinary hippotherapy practice guidelines. Statements that did not reach consensus in this second round, were listed as a “non-consensus statement” in a separate document (Annexure S).

6.5.2.3 Results of round two

Round two had a 100% questionnaire response rate and took participants on average about one hour to complete.

Round two led to input into four different output categories:

- Experts reached consensus on 12 statements to be *excluded* from the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP (**Error! Reference source not found.**).
- Experts reached *consensus* on 74 statements to be included in the final guidelines.
- Experts reached consensus on four of the new statements, to be *include* in the final guidelines *with comments*, that had to be addressed.
- Experts did *not reach consensus* on 23 of the new statements.

The consensus levels of 78 statements that reached consensus to be included are depicted in Table 6-2. The wording of the statement numbers can be viewed in Annexure Q.

Table 6-2: Consensus levels for Delphi round two

Treatment principles		Statements regarding the use of hippotherapy concepts				
Consensus level for therapeutic relationship statements	Statements regarding therapists	Statements regarding human team members	Statements regarding horse temperament	Statements regarding physical handling		
	1.1 = 82% 1.2 = 100%	4.1 = 91% 4.2a = 64% 4.2b = 100% 4.2c = 73% 4.2d = 82% 4.2e = 91% 4.2f = 82%	2.1 = 100% 5.1 = 91% 5.2 = 100%	1.4 = 82%		
Consensus level for presentation principal statements	Statements regarding theoretical framework	Statements regarding precautions				
	No consensus in round 2					
Consensus level for activity	Statements regarding treatment goals	Statements regarding activity characteristics	Statements regarding horse breed	Statements regarding horse size	Statements regarding horse movement	Statements regarding dosage



Treatment principles						
Statements regarding the use of hippotherapy concepts						
requirement statements	No consensus in round 2	7.1 = 91% 7.2a = 82% 7.2c = 73% 7.3b = 91% 7.3c = 82% 7.3d = 64% 7.4b = 73% 7.4c = 64%	8.1 = 64% 8.4 = 73%	9.1b = 82% 9.1c = 82% 9.2a = 64% 9.2b = 64% 9.5 = 91% 9.6 = 73%	1.3 = 100% 10.1a = 100% 10.1b = 100% 10.2a = 91% 10.2b = 100% 10.2c = 91% 10.2d = 91% 10.3a = 91% 10.3b = 82% 10.3c = 100% 10.4a = 91% 10.4b = 73% 10.4c = 73% 10.5b = 100% 10.5d = 82% 10.6a = 64% 10.6b = 73% 10.6c = 100% 10.7b = 100% 10.7c = 91% 10.9 = 73% 10.11 = 82% 10.12 = 82% 10.13a = 91% 10.13d = 73% 10.13e = 91% 10.13f = 82% 10.13g = 82% 10.14 = 100% 10.15 = 82% 10.16 = 91% 10.18 = 100%	11.1 = 73% 11.2 = 73% 11.3 = 64% 11.7 = 82% 11.8 = 73% 11.9 = 100% 11.10 = 82% 11.11 = 64%
Consensus level for structuring principal statements	Statements regarding ground courses	Statements regarding manner of leading	Statements regarding positioning of the client on the horse	Statements regarding horse tack and equipment	Statements regarding physical environment	Statements regarding environmental temperature
	No consensus in round 2		13.2 = 73%	14.4a = 91% 14.4b = 64% 14.4d = 73% 14.5 = 91% 14.6b = 82% 14.8 = 91% 14.9 = 100% 14.11 = 82%	No consensus in round 2	

6.5.3 Delphi round three

During the process of developing the third Delphi round, some statements were again collated, and others separated. Therefore, the numbers given in the result section of round

two also do not match the numbers given in the method section of round three. The third Delphi round is depicted in Figure 6.3.

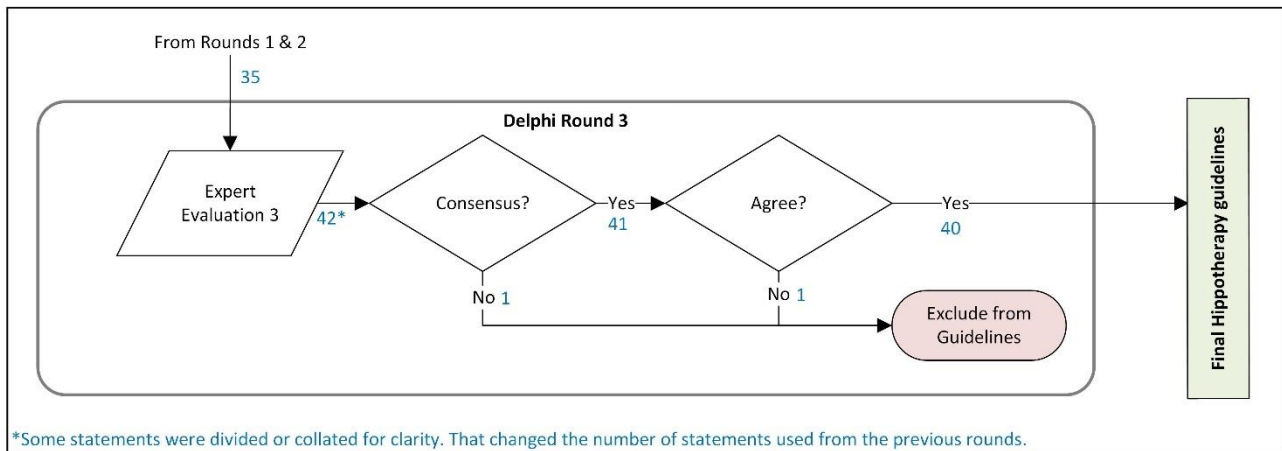


Figure 6.6: Delphi round three

6.5.3.1 Method of round three

A total of 42 statements were presented to the expert panel in the third Delphi round.

Two categories of statements were **included** in the third Delphi-round (Annexure R).

- New statements that did not reach consensus yet, thus the second round for these statements.
- Consensus statements from round one and two that needed refinements.

The new statements were presented to the expert panel with feedback in the same manner than the original round one statements.

Regarding the consensus-statements that were refined either with word changes or by adding a definition, experts had to either “agree” or “disagree” on the refinements. If they disagreed, the wording of a statement was left as it was when they reached consensus. If they agreed, the refined statement was used in the final guidelines.

No space for comments was provided in this round. The expert panel members already had an opportunity to comment in previous rounds on all the statements that were presented.

This round concluded the study and by the end of this phase, statements that reached consensus on inclusion were called guidelines (Chapter 7). During the final word formulation

of the transdisciplinary hippotherapy practice guidelines for clients with spastic CP, some guidelines were collated. For example, when consensus was reached on the hand placement of a therapist when treating clients with hemiplegia and consensus was reached for the same hand placement for clients with diplegia and clients with quadriplegia, the three statements were collated into one hand placement guideline for all clients with spastic CP. Another example is the manner of leading. Consensus was reached on two positions from where the horse handler should lead a therapy horse and these two statements were collated into one statement by using the word “and”.

6.5.3.2 Analysis of round three

The responses were again tabulated in a Microsoft Excel spreadsheet and consensus statements and non-consensus statements calculated.

6.5.3.3 Results of round three

Round three again had a 100% questionnaire response rate and took participants on average about one hour to complete.

The statements were grouped into the following three categories:

- Experts reached *consensus* on one statement to be *excluded* from the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP (Annexure P).
- Experts reached *consensus* on 40 statements to be *included* in the final guidelines.
- Experts did *not reach consensus* on one statement that was also excluded from the final guidelines (Annexure S).

The consensus levels of statements are depicted in Table 6-3. The wording of the statement numbers can be viewed in Annexure R.

Table 6-3: Consensus levels of Delphi round three

Treatment principles		Statements regarding the use of hippotherapy concepts				
Consensus level for therapeutic	Statements regarding therapists	Statements regarding human team members	Statements regarding horse temperament	Statements regarding physical handling		



Treatment principles						
Statements regarding the use of hippotherapy concepts						
relationship statements	Consensus on refinements 2.1 = 100% 2.2 = 91%	1.1 = 82%	Consensus on refinements 3.1 = 100% 3.2 = 100%	Consensus on refinements 4.1 = 91% 4.2 = 100% 4.3 = 100% 4.4a = 91% 4.4b = 100% 4.4c = 73% 4.5 = 100%		
Consensus level for presentation principal statements	Statements regarding theoretical framework	Statements regarding precautions				
	Consensus on refinements 5.1 = 91%	Consensus on refinements 6.1 = 100% 6.2 = 100% 6.3 a = 100% 6.3 b = 91% 6.3 c = 100% 6.3 d = 100% 6.4 = 100% 6.5 = 100%				
Consensus level for activity requirement statements	Statements regarding treatment goals	Statements regarding activity characteristics	Statements regarding horse breed	Statements regarding horse size	Statements regarding horse movement	Statements regarding dosage
	No consensus in round 3			2.3 = 82% Consensus on refinements 7.1 = 100% 7.2 = 100%	3.2 = 73% Consensus on refinements 8.1a I = 100% 8.1a II = 82% 8.2a = 64% 8.2b = 82% 8.3 = 100%	Consensus on refinements 9.1 = 100% 9.2 = 91%
Consensus level for structuring principal statements	Statements regarding ground courses	Statements regarding manner of leading	Statements regarding positioning of the client on the horse	Statements regarding horse tack and equipment	Statements regarding physical environment	Statements regarding environmental temperature
	No consensus in round 3			4.2 = 73% Consensus on refinements 10.1 = 100% 10.2 = 100% 10.3 = 64% 10.4 = 82%	Consensus on refinements 11.1 = 100% 11.2 = 91%	No consensus in round 3

The process of refinement of the consensus statements into guidelines led to 166 guidelines, as depicted in Table 6-4.

Table 6-4: Summary of final transdisciplinary hippotherapy practice guidelines

Therapeutic relationships	Presentation principles	Activity requirements	Structuring principles
Hippotherapy providers 4 guidelines	Theoretical framework 1 guideline	Treatment goals 3 guideline figures	Ground courses 8 guidelines
Human hippotherapy team 8 guidelines	Precautions 10 guidelines	Activity characteristics 24 guidelines	Manner of leading 1 guideline
Horse temperament 8 guidelines		Horse breed 3 guidelines	Positioning of the client on the horse 11 guidelines
Physical handling of the client 10 guidelines		Horse size 10 guidelines	Horse tack 6 guidelines
		Horse movement 36 guidelines	Therapy equipment 5 guidelines
		Dosage 13 guidelines	Physical environment 3 guidelines
			Environmental temperature 2 guidelines

This phase also led to a list of statements that reached consensus on their exclusion (Annexure P) and a list of statements that did not reach consensus (Annexure S).

6.6 DISCUSSION

In accordance with the guideline development process followed in this study, this phase served both to build consensus on the guidelines to be included and as an external review of the guideline refinements.¹³ The researcher's prolonged engagement throughout all the study-phases, including all three rounds of the Delphi technique, contributed to the credibility of the study.¹⁴¹ Obtaining consensus from the expert panel inherently adds to the conformability of the study results, as well.

Research credibility was further established by involving more than one person in interpreting the results.¹⁴¹ An independent SLP, the supervisor and co-supervisor were involved in the analysis process and discussion of each Delphi round.¹⁴¹ This involvement and agreement of several people on the data's accuracy, contributed to the conformability of the results.¹⁴¹

The 100% questionnaire return rate indicated a level of commitment from the experts taking part in the study. Although the term "expert" is contested in some literature,¹⁸⁴ the high level of experience in this particular group rendered it appropriate. As expert panel members were purposively selected for knowledge, experience and diversity they were less likely influenced by group opinions and bias.¹⁸⁴

6.7 SUMMARY

The consensus building process for the transdisciplinary hippotherapy practice guidelines for clients with spastic CP was discussed in this chapter. Three rounds of a modified Delphi technique were employed as research method. Five PTs, three OTs and three SLPs from six countries took part in all three Delphi rounds that led to 166 transdisciplinary hippotherapy practice guidelines for clients with spastic CP. The consensus level for each round was set at 60%, due to the small expert panel size.

Round one generated five output categories, namely: statements where experts reached consensus on exclusion, statements where experts reached consensus on inclusion without comments, statements where experts reached consensus on inclusion with comments, new statements that emerged and statements where experts did not reach consensus.

Round two generated four output categories, namely: statements where experts reached consensus on exclusion, statements where experts reached consensus on inclusion, statements where experts reached consensus that “new statements” should be included with comments and statements where experts did not reach consensus.

Round three generated three output categories, namely: statements where experts reached consensus on exclusion, statements where experts reached consensus on inclusion and statements where experts did not reach consensus.

Table 6-4 provides a summary of the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP was given in this chapter. Lastly a short discussion on the modified Delphi technique reminded the reader that this phase concentrated on consensus building among experts on the guideline statements developed in the previous phases of the study.

This detailed report on each round gives the reader insight into the process and how consensus was reached.

Chapter 7 discusses the results of the study and how the aim and objectives were reached. A detailed discussion on how these guidelines make a unique contribution to the scientific development of hippotherapy is given. The final transdisciplinary hippotherapy practice guidelines for clients with spastic CP is also given in Chapter 7.

CHAPTER 7

DISCUSSION

7.1 INTRODUCTION

Before the study was conducted, there were no transdisciplinary hippotherapy practice guidelines to guide OTs, PTs and SLPs in their professional reasoning to effectively plan and execute hippotherapy when treating clients with spastic CP, as was described in Chapter 1. Hence, the need for guideline development was identified and addressed by this study. The study aim was: To develop transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

This study employed three phases to achieve this aim and followed a guideline development process described by Rosenfeld, Shiffman and Robertson.¹³ By implementing this phased approach, each phase led to unique findings that contributed to the scientific development of hippotherapy. Chapter 3 gave an overview of the research methodology, but each phase of the study was described and discussed in a separate chapter.

Following the structure of the previous chapters, the researcher starts this chapter with a reflection on her positionality. Although each phase of the study was already discussed in their separate chapters, this chapter now concludes on the findings of each phase. After the discussion of the phases, the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP are provided and discussed.

7.2 POSITIONALITY

Embarking on and completing this study not only broadened the researcher's hippotherapy horizons, but also contributed to her personal growth. She devised the guidelines through enquiry and through implementing knowledge of the guideline development process that led to new knowledge (epistemology).¹²⁷ The development of these guidelines strengthened her pragmatic philosophical stance that research should solve problems.¹²⁶ She is also convinced that therapists will gain knowledge and experience when they take action and implement these guidelines internationally.¹²⁷

The researcher still has a dual stance regarding the implementation of the guidelines as she is an insider implementing it into her own therapy and an outsider when presenting the guidelines and train other therapists from a research perspective. Acknowledging her dual stance in a transparent way will continue to create trust among fellow therapists and researchers.

Lastly, the guideline development process created an acute awareness of how much research is still needed in the hippotherapy field. This awareness strengthened the researcher's personal belief that she should contribute to further develop hippotherapy, phase is as it remains a complex intervention.

7.3 FINDINGS

Before the findings of each phase can be discussed it is important to understand what led to each phase and what was done in each phase. Therefore, a summary of each phase will now be given before each phase is discussed.

7.3.1 Scoping review – Phase 1

Before Phase 1 commenced, hippotherapy has been established as a complex intervention in Chapter 2 – the literature chapter. Understanding that hippotherapy is a complex intervention, led the researcher to delve into the developmental phases of complex interventions. By exploring how hippotherapy studies contributed to the various scientific development phases, it was clear that hippotherapy is in the early phases of scientific development. This perception of the early scientific developmental phase of hippotherapy was also confirmed by Wood and Fields.³

Phase 1 was a scoping review and was described in Chapter 4 of the study. This phase contributed to filling a research gap by identifying and describing hippotherapy concepts.^{37-38,51} Wood and Fields also identified a need for concept identification and stated that this research gap was a “neglect of one critical area of foundational work”.³ Phase 1 further served as the theoretical enquiry at the beginning of the guideline development process.

Hence, Phase 1 set out to fulfil objective one of this study, namely: To identify, describe and explore concepts that are referred to in selected literature, in order to constitute hippotherapy practices for clients with spastic cerebral palsy.

Objective one was met through a scoping review and, as a result, Phase 1 not only identified and described 19 hippotherapy concepts from 51 scoping documents, but also structured them under four treatment principles. Phase 1, in its own right, contributed to the scientific development of hippotherapy as was described and discussed in Section 4.5.

Each hippotherapy concept was discussed in this section, in relation to the details found on each concept in the scoping documents. This data confirmed the notion that hippotherapy is a complex intervention, and due to the complexity require the hippotherapy provider, in this study a OT, PT or SLP, to have received post-graduate training in hippotherapy. This data also contributed to the explanation of what should be considered when hippotherapy is used as treatment tool or when hippotherapy is researched. These concepts contributed to the theoretical development of hippotherapy as a complex intervention. However, more research is still needed on each of the 19 identified hippotherapy concepts, as well as how these concepts link to one another and influence one another.

7.3.2 Exploration of hippotherapy practices and guideline construction – Phase 2

The 19 hippotherapy concepts from Phase 1 led to the questionnaire development in Phase 2, as described in Chapter 5. The results of the questionnaire then led to the drafting of 213 guideline statements.

Phase 2 set out to achieve objectives two and three of this study.

Objective two was: To explore transdisciplinary hippotherapy practices for clients with spastic cerebral palsy through the involvement of hippotherapy practitioners. Objective two was achieved by means of administering a questionnaire asking questions on each of the hippotherapy concepts to 11 experienced hippotherapy practitioners that were called therapist-participants. The therapist-participants in Phase 2 served as the guideline development group that provided their applicable expertise in the field, by answering the questionnaire. In addition to contributing to Phase 2, including OTs, PTs and SLPs in the study and asking them questions on how they use hippotherapy concepts, is also a starting point in adhering to this recommendation of Wood and Fields.³ Wood and Fields mentioned a need for studies that focused on hippotherapy providers.

Objective three of the study was: To construct practice guidelines for transdisciplinary hippotherapy by integrating the information gathered in objectives one and two. By documenting the therapist-participants' knowledge and combining it with the information from the scoping review enriched the guideline statements with a practical perspective. The findings of Phase 2 were 213 guideline statements – again, structured under the four treatment principles of VdTMoCA.¹⁴⁸ The findings in Phase 2 were discussed in Section 5.9.

As the researcher could not find any other studies focusing on how therapists implemented the hippotherapy concepts, the results of Phase 2 cannot be compared with other literature and thus serve as a benchmark for future comparisons.

These findings gave a practical perspective on current hippotherapy practices that set the stage for further exploration of such practices, by each profession, in future research.

7.3.3 Consensus process – Phase 3

The 213 guideline statements from Phase 2 were subjected to an external review and consensus-building process in Phase 3 of the study. Phase 3 is described in Chapter 6 and was done to achieve objective four of the study.

Objective four was: To obtain consensus from an expert panel on the transdisciplinary hippotherapy practice guidelines using a modified Delphi technique. The hippotherapy expert panel consisted of three OTs, five PTs and three SLPs from six different countries. The Delphi technique was conducted in three rounds – each building onto the previous round. Phase 3 concluded the study by producing 166 transdisciplinary hippotherapy practice guidelines for clients with spastic CP, to meet the aim of the study.

Phase 3 was discussed in Section 6.6 regarding the trustworthiness of the Delphi technique, but the guidelines are also discussed in more detail under the four treatment principles in Section 0 of this chapter.

These transdisciplinary guidelines are now a new resource that OTs, PTs and SLPs can use when conducting hippotherapy with clients with spastic CP. The newly developed hippotherapy practice guidelines can inform them on the application of hippotherapy as a treatment tool and can set a standard for others when conducting further hippotherapy research.

The transdisciplinary hippotherapy practice guidelines for clients with spastic CP is given in the following section. This included an introduction to therapists as well as notes and definitions, as was agreed upon by the expert panel members. Please also note that the guidelines have its own numbering.

7.4 TRANSDISCIPLINARY HIPPO THERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY

Introduction

For these transdisciplinary hippotherapy practice guidelines, hippotherapy is defined as using the movement of the horse as a treatment tool to achieve functional outcomes in occupational therapy, physiotherapy and speech and language pathology.

These guidelines were developed for the treatment of clients with spastic (heightened tone) cerebral palsy (CP). A topographical classification (hemiplegia, diplegia and quadriplegia) was used in combination with the Gross Motor Functioning Classification System (GMFCS).

These guidelines focus on hippotherapy (when the client is mounted) and are not intended to inform on groundwork or any other therapy that involves horses.

The term “hippotherapy horse” is used throughout these guidelines and encompasses all equines, including ponies that are used for hippotherapy.

These guidelines were developed in fulfilment of a PhD study in occupational therapy at the University of Pretoria. Therefore, the titles for each profession are those used in South Africa, namely occupational therapist (OT), physiotherapist (PT) and speech and language pathologist (SLP).



GUIDELINES REGARDING THERAPEUTIC RELATIONSHIPS

1. Hippotherapy providers

Definition

The person in charge of planning and executing the hippotherapy session. In this study, the focus was on OTs, PTs and SLPs.

Guidelines

- 1.1. *Hippotherapy can be used as a treatment tool by OTs, PTs or SLPs in intervention.*
- 1.2. *A therapist registered with the professional health and care council of their country (or as required by their country's law) could use hippotherapy as a treatment tool in an OT, PT or SLP session.*
- 1.3. *Before implementing hippotherapy, therapists attend a course recognised by either the professional health and care council or the hippotherapy association of their country.*
- 1.4. *OTs, PTs or SLPs should apply professional reasoning with the **individual** client in mind when considering any of these guidelines.*

2. Human hippotherapy team

Definitions

Horse handler: the person directing the horse's movement, in accordance with the directions of the therapist.

Side walker: The person that supports the client and assists the therapist, while walking besides the horse.

Note: These guidelines inform on **the most appropriate possibility** or **possibilities** of composition of the therapy team for a client with spastic CP on a specific GMFCS level. This does **not** mean that this is the **only possible composition** of the therapy team.



Guidelines

Size and composition of the hippotherapy team for *GMFCS levels IV and V.*

2.1. *A team of three people conducts treatment:*

- *a therapist on one side of the horse*
- *one side walker on the other side of the horse*
- *a horse handler that handles the horse*

Size and composition of the hippotherapy team for *GMFCS levels I, II or III.*

Note: More variation in the composition of the team might be applicable for clients on GMFCS levels I, II or III.

2.2. *A team of four people conducts treatment:*

- *the therapist giving guidance (not hands on)*
- *two side walkers walking on each side of the horse*
- *a horse handler that handles the horse*

2.3. *A team of three people conducts treatment:*

- *the therapist on one side of the horse (performing hands on therapy)*
- *a side walker on the other side of the horse*
- *a horse handler that handles the horse*

2.4. *A team of three people conducts treatment:*

- *the therapist on one side of the client (performing no hands-on therapy)*
- *a side walker on the other side of the client*
- *a horse handler that handles the horse*



2.5. *A team of three conducts treatment:*

- *a therapist*
- *a horse handler that handles the horse*
- *a parent may perform the role of a side walker provided that*
 - a. the parent is allowed to take part in a therapy session in that particular country;*
 - b. has received adequate training;*
 - c. is physically able; and*
 - d. that the client responds well to the parent being present.*

2.6. *A team of three people conducts treatment:*

- *one therapist qualified in hippotherapy*
- *one therapist undergoing hippotherapy training, walking on the other side of the client*
- *a horse handler that handles the horse*

2.7. *A team of two people conducts treatment:*

- *the therapist performs hands on therapy*
- *a horse handler that handles the horse*
- *there are no side walkers*

2.8. *Multidisciplinary therapy sessions (any combination of OT, PT and SLP) might be beneficial to a client, should it be possible.*

This will then be a team of three that conducts treatment:

- *two therapists walking on either side of the client*
- *a horse handler handles the horse*



3. Horse temperament

Definition

The nature of horses, as shown in the way they behave or react to situations or people.

Guidelines

3.1. *Ideally a variety of horses, regarding temperament, conformation, movement, and weight-bearing ability, which are trained for hippotherapy, are needed.*

3.2. *Use a hippotherapy horse that is **cooperative** when treating clients on all GMFCS levels.*

Definition: A **cooperative** horse responds well to the handler and is attentive and easy to correct.

Note: A **cooperative** horse enhances the safety within the therapy session.

3.3. *Use **an even-tempered** horse when treating clients on all GMFCS levels, this is even more important when treating clients on the GMFCS levels IV-V as it enhances the safety within the therapy session.*

Definition: An **even-tempered** horse has an even, calm state of mind and is not easily disturbed or annoyed.

3.4. *Use a hippotherapy horse that is **actively involved** in the therapy session, yet **unruffled** when treating clients on the GMFCS levels I-III, especially with hemiplegia or diplegia.*

Definition: A horse that is **actively involved** in therapy sessions is aware of what is going on around them.

A horse that is **unruffled** responds in a composed, unmoved and controlled manner to external stimuli or demands.

3.5. *Use a hippotherapy horse that is **aware** of all clients regardless of their GMFCS levels, but only responds to the horse handler.*



3.6. Use a hippotherapy horse that is **aware**, but **not distracted** by the surroundings when treating clients on all GMFCS levels.

3.7. Use a hippotherapy horse that is **bombproof** when treating clients on GMFCS levels I-III.

Definition: A **bombproof** horse is not overly tactile, sound or visually sensitive, not flighty and does not spook easily. A bombproof horse is robust (sturdy, tough and steady) and confident.

Note: “**Bombproof**” does not mean that the horse is slow.

Also bear in mind that even the most **bombproof** horse can still react in an unexpected manner.

3.8. Use a hippotherapy horse that is not only **bombproof** but also **unruffled** when treating clients on GMFCS levels IV-V, because this group is likely to display unexpected behaviour and might need more physical manipulation from the therapist and side walker.

4. Physical handling

Definition

Hands-on support and/or facilitation of movement that a therapist gives to a client.

Guidelines

4.1. Prior to any treatment, the therapy is explained to the client, parents and care givers and permission (written and verbal) is obtained, including an explanation of the need for physical handling, if applicable.

4.2. Hands-on support for clients can be given at their:

- a. shoulders
- b. pelvis
- c. thighs
- d. knees



e. calves

f. ankles

- 4.3. *Therapists consider the best functional movement for their clients when choosing the key point of control without compromising safety.*
- 4.4. *Hands-on support should stabilise and/or facilitate movement.*
- 4.5. *Hands-on support may be needed to obtain, maintain or improve postural alignment.*
- 4.6. *Hands-on support should not interfere with posture and movement.*
- 4.7. *The positioning of the client on the horse will determine where stability, and thus, physical support is needed, for example, when the client is in prone and bears weight through their upper extremities, elbow support and/or shoulder support might be needed.*
- 4.8. *Therapists move their hands to a different key point of control or lessen support when the client starts leaning into the support, provided that the client is not fatigued.*
- 4.9. *Therapists give hands-on support and/or facilitation to clients on GMFCS levels I to III in therapy sessions when using hippotherapy as treatment tool.*
- 4.10. *Therapists give hands-on support to clients on GMFCS levels IV to V throughout every therapy session when using hippotherapy, to provide stability where needed, correct posture if applicable and for safety purposes, as required.*

GUIDELINES REGARDING PRESENTATION PRINCIPLES

5. Theoretical framework

Definition

Theory to help explain why equine movement can help to achieve treatment goals.

Guidelines

- 5.1. *The most suitable treatment frames of reference that are safe to implement on a horse should be used when treating clients, provided that the therapist is familiar with them.*



Some frameworks to consider are:

- a. Biomechanical Frame of Reference for Positioning Children for Functioning*
- b. Cognitive Disability Frame of Reference (Claudia Allen)*
- c. Dynamic Systems Theory*
- d. Enhance Childhood Occupations*
- e. Enhance Social Participation*
- f. Motor Skill Acquisition*
- g. Neurodevelopmental Treatment (Bobath)*
- h. Sensory Integration (Ayres)*

6. Precautions

Definition

Something that is done in advance to prevent problems or to avoid danger.

Note: The following precautions are taken into consideration when treating clients with spastic CP from all classification groups.

As these guidelines are intended for hippotherapy where the client is mounted, contraindications fell outside the scope of these guidelines.

Guidelines

- 6.1.** *If an initial referral letter from a physician is not required in your country and/or more medical information is needed, contact the treating physician (with the client, parent or care taker's permission) before treating a client.*
- 6.2.** *The team should regularly practise mounting and dismounting.*
- 6.3.** *Regular practising of emergency dismounts within the team with a specific client in mind is advised.*
- 6.4.** *Give hands-on postural support, where needed.*



- 6.5. *Enhance physical assistance with verbal instructions on positions and functional activities while mounted.*
- 6.6. *Add an extra side walker to the team to support the client, when needed.*
- 6.7. *Consider alternative mounting procedures, should the client's needs or treatment goals require it.*
- 6.8. *Accommodate adductor tightness by implementing one of the following strategies:*
 - a. *selecting a narrower horse*
 - b. *using long strides (from the horse) on long straight lines (ground course)*
 - c. *adapting positioning on the horse*
 - d. *careful selection of equipment*
- 6.9. *Seek alternative head protection (if a standard riding hat is not suitable) to accommodate poor head control or a different shaped head, provided that the parents or caregiver have given written consent.*
- 6.10. *An allocated, trained first aider (therapist or side walker) should be present within every therapy session, for when first aid is needed.*

GUIDELINES REGARDING ACTIVITY REQUIREMENTS

7. Treatment goals

Definition

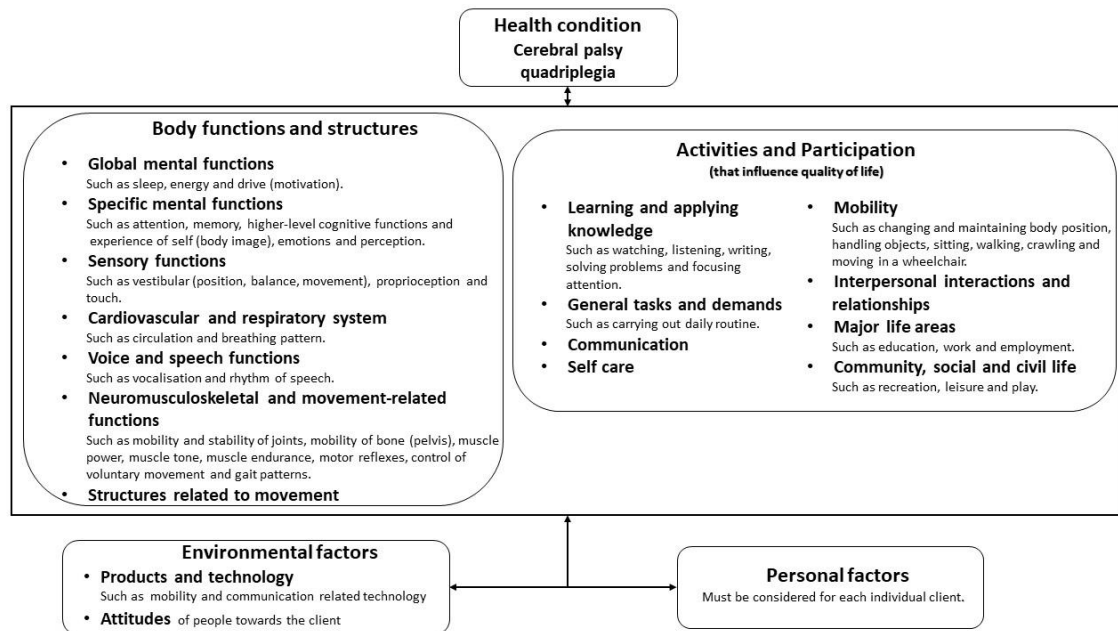
Something that you hope and plan to achieve in treatment that closely relates to intervention outcomes.

Note: All the treatment goals are given in ICF terms and tabulated in a graph for each diagnostic group. Although the headings are similar, the details underneath each heading differ in accordance with the comments from experienced therapists and an expert panel.

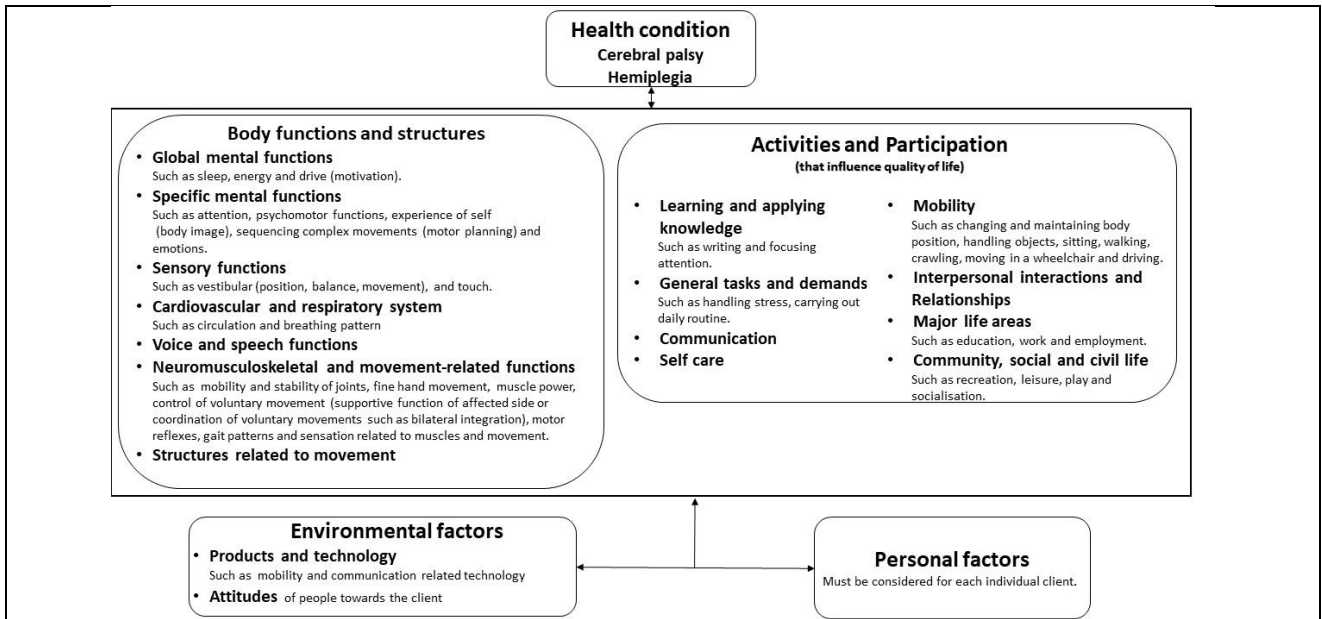
Please bear in mind that these graphs are intended to help therapists when formulating **specific individual** goals for each individual client, while using professional reasoning, but not to replace professional reasoning.

Guidelines

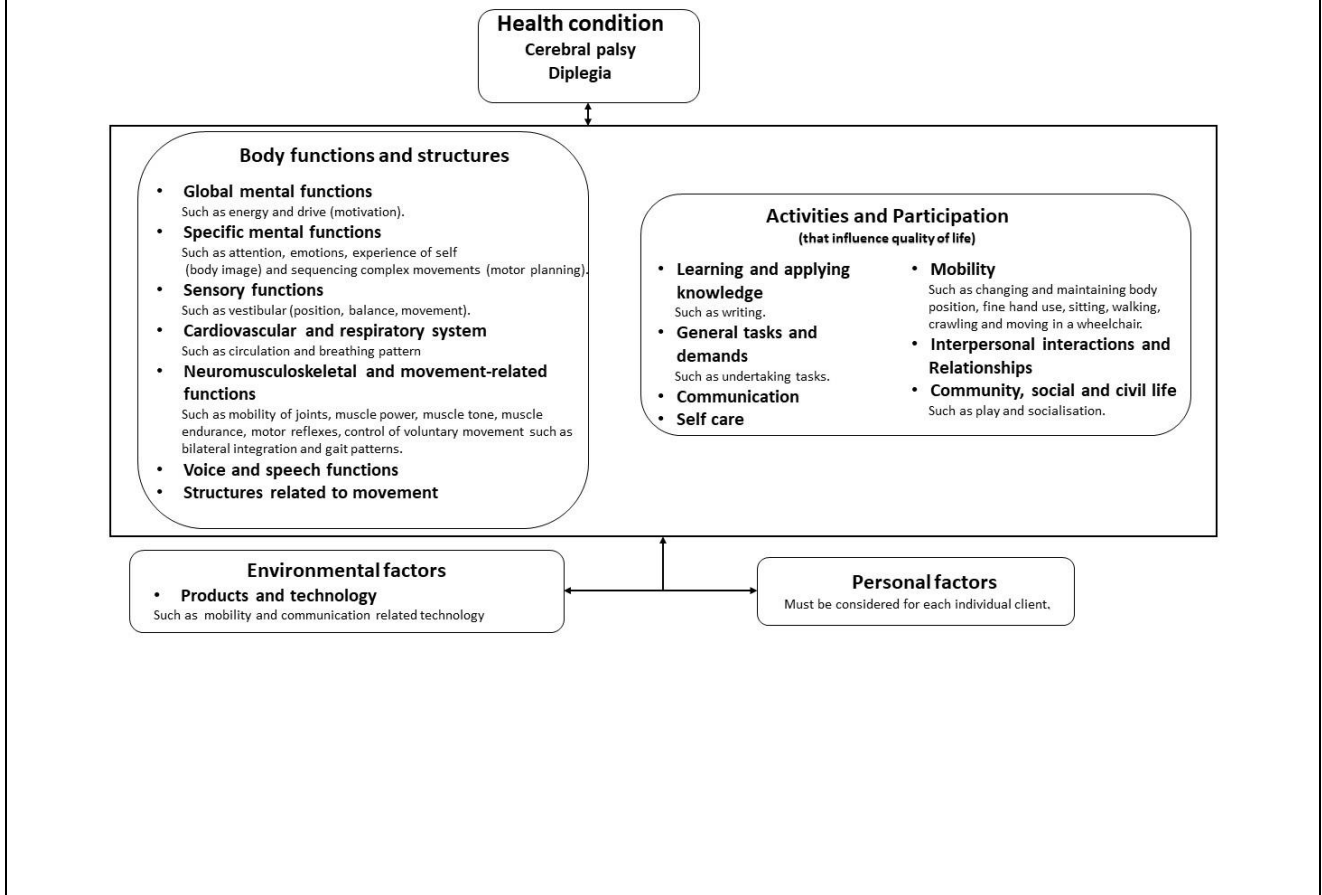
7.1. To formulate treatment goals for clients with **quadriplegia** the following diagram can be used.



7.2. To formulate treatment goals for clients with **hemiplegia** the following diagram can be used.



7.3. To formulate treatment goals for clients with **diplegia** the following diagram can be used.





8. Activity characteristics

Definition

Descriptive components of an activity or activities done while the client is mounted.

Note: Such activities should always have a specific purpose for an individual client and aim to reach functional therapy goals.

These guidelines focus on possible activities while the client is mounted. Please keep the nature of hippotherapy in mind when considering the use of these activities. Also take the GMFCS levels of functioning into consideration. More than one activity characteristic might be appropriate for a client in one therapy session or over time in different therapy sessions.

Guidelines

8.1. *Although the movement of the horse (used as a stand-alone activity) is the starting point in hippotherapy, other activities can be considered for CP clients on **all GMFCS** levels.*

Activity characteristics to consider for all clients on GMFCS levels I-III while on horseback

8.2. *Upper limb exercises (performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.*

8.3. *Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction, such as placing rings or containers on poles or hooks or reaching to grasp objects.*

8.4. *Active exercises, such as sit-ups, laying down, standing up, lifting medicine balls etc.*

8.5. *Eye-hand coordination activities, such as ball games.*

8.6. *Three dimensional visual perceptual activities within games, while on horseback.*

8.7. *Two dimensional visual perceptual activities within games, while on horseback.*

8.8. *Fine motor activities, such as putting/taking out pegs/clips in the mane or putting stickers on the horse.*



- 8.9. *Use the horse as motivation to communicate, for example, the client must make a sound/sign before the horse walks.*
- 8.10. *Use Alternative and Augmentative Communication during hippotherapy sessions to allow the client to communicate with the team and the horse.*
- 8.11. *Cognitive games, such as memory or recognition games in which the child would identify, search for and find objects.*
- 8.12. *Sport-related activities, such as hitting a target or throwing a ball into a basket.*
- 8.13. *Incorporating rhythm into games, such as clapping and counting.*
- 8.14. *Fine motor activities, such as drawing and writing.*

Activity characteristics to consider for all clients on GMFCS levels IV-V while on horseback

- 8.15. *Upper limb exercises (performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.*
- 8.16. *Games involving upper limb stretching, elevation, extension, diagonal and horizontal abduction, such as placing rings or containers on poles or hooks or reaching to grasp objects.*
- 8.17. *Fine motor activities, such as putting/taking out pegs/clips in the mane or putting stickers on the horse.*
- 8.18. *Sport-related activities, such as hitting a target or throwing a ball into a basket.*
- 8.19. *Use the horse as motivation to communicate, for example, the client has to make a sound/sign before the horse walks.*
- 8.20. *Use Alternative and Augmentative Communication during hippotherapy sessions to allow the client to communicate with the team and the horse.*
- 8.21. *Cognitive games, such as memory or recognition games in which the child would identify, search for and find objects.*



More activity characteristics to consider for clients with hemiplegia and diplegia on GMFCS levels IV-V while on horseback

8.22. *Eye-hand coordination activities, such as ball games.*

8.23. *Three-dimensional visual perceptual activities within games.*

8.24. *Two-dimensional visual perceptual activities within games.*

9. Horse breed

Definition

A group of horses with a common origin and possessing certain distinguishable characteristics that are transmitted to their offspring.

Guidelines

9.1. *There is no one preferred horse breed that is recommended for hippotherapy.*

9.2. *A cob (referring to a body type rather than a specific breed) might be considered for hippotherapy. Such a horse is short, usually of a stout build, with strong bones, large joints and steady disposition.*

9.3. *Provided that the pony or horse is suitable for therapy regarding conformation, movement, temperament, weight-bearing ability and training, ponies/horses that are native to your country should be considered for hippotherapy.*

10. Horse size

Definition

Size of the horse encompasses both the height of the horse and the width of the horse.

Width of the horse: Both the distance between the shoulder blades of the horse and the size of the barrel shape of the horse's body are considered.

Height of the horse: The height of a horse is measured from the highest point of the withers, where the neck meets the back, down to the ground.



Note: In these guidelines the height of the horse is described relative to the height of the therapist.

Please bear both the needs of the client and the safety (risk of injury) to the therapist in mind when considering the height of the therapy horse. A variation in horse height was deemed appropriate for some GMFCS levels by the expert panel.

Guidelines

For clients on GMFCS levels I, II or III

- 10.1. The back of the horse can be the same height as the therapist's chest.*
- 10.2. The back of the horse can be anywhere between the therapist's waist and the therapist's chest.*
- 10.3. The back of the horse can be in line or at the same height as the therapist's waist.*
- 10.4. The back of the horse can be in line or at the same height as the therapist's shoulders.*
- 10.5. For clients on **GMFCS levels IV or V** the back of the horse is the same height as the therapist's chest.*

Width of the horse

Note: Statements on the width of the horse is but one aspect to consider and **does not exclude** other hippotherapy concepts, such as positioning of the client on the horse.

Please bear in mind that a client should not experience pain (or other harm) due to the width of a horse.

- 10.6. Consider the client's physical size, muscle tone, pelvic position and hip range of motion when deciding on the width of a horse.*
- 10.7. Use a broader hippotherapy horse that will provide a bigger base of support for clients with less dynamic sitting balance but be cautious of the influence on the client's pelvis and hips.*



10.8. *Take the planned positional requirements (for the client), into consideration when deciding on the width of a horse.*

10.9. *Use a broader hippotherapy horse when considering alternative positions that would benefit from a broader base but be cautious of the influence thereof on the client's hips and pelvis.*

10.10. *Consider using a narrower horse (including the shape of the barrel) for clients with tight adductors and less range of movement.*

11. Horse movement

Definition

The act of the horse moving their body through different gaits, using different step lengths and/or transitions. These guidelines also inform on how the movement of the horse facilitates pelvic movement of the client.

Note: Although horses move the pelvis of the client in all three dimensions, the therapist can choose a horse that emphasises movement in one plane.

Also bear in mind that one movement suggestion does not exclude other movement possibilities.

Guidelines regarding general movement considerations

11.1. *The movement of a horse is the tool used in hippotherapy.*

General movement considerations for all clients with spastic CP

11.2. *Use a balanced horse.*

11.3. *Consider using a horse with smooth and long striding movements when the client starts hippotherapy.*

11.4. *A horse with a longer stride and with smooth movements is used when the client presents with heightened tone and is selected in relation to the age/size of the client.*

11.5. *A horse that gives more concussion and vertical displacement is used when the client presents with low tone, providing the client has enough head control.*



11.6. Use different horses in different sessions, if and when needed, to address the multifactorial problems and changing needs of a client with quadriplegia.

11.7. Use more forward movement with more abrupt changes for clients with diplegia when the client is ready for more advanced input.

Guidelines regarding horse's gaits

Definition

Gaits are ways of locomotion used by the horse. In hippotherapy the walk and the trot (less often) are used in therapy.

Note: Therapists should keep observing the client's response and adjust the gait accordingly should the need arise.

Guidelines

11.8. Introduce the gaits in the following order: Start at a slow walk and then introduce a medium to fast walk when the client is physically able to tolerate the movement.

11.9. Introduce a slow trot (for a few strides) only when the client has core control and can maintain head control in a fast walk.

11.10. Slow trotting is introduced sooner for clients with diplegia than for clients with quadriplegia.

Repetitive transitioning between gaits

Definition

Transitioning is when the horse is directed to move from one gait to another (walk to a trot) or from a halt to a walk. When this is repeated as a therapy tool (for instance halt, to walk, to trot, to walk, to halt), in any order, it is called repetitive transitioning.

Guidelines

*11.11. Introduce **repetitive transitioning** from a halt to walk to halt for clients on **GMFCS levels I-III** to facilitate desired responses in the client.*



11.12. *Introduce repetitive transitioning between gaits and gait-speed when treating clients with spastic CP on **GMFCS levels I-III** by using professional reasoning when considering the following transition options carefully:*

- a. Start transitioning from halt, to walk, to halt before altering between walking speeds (slow walking, to medium walking, to fast walking).*
- b. Alter between walking speeds before grading upwards to transitioning from halt, to walk, to halt.*
- c. Grade upwards to transition from a halt, to a walk, to a trot (few strides) and backwards again.*

11.13. *Introduce repetitive altering between walking speeds when treating clients with spastic CP on **GMFCS levels IV-V** in earlier sessions (sessions 1-5).*

Note: The number of recommended sessions is only a guideline and not a rule.

11.14. *Progress to repetitive transitioning from halt - walk – halt when treating clients with spastic CP on **GMFCS levels IV-V** in earlier sessions (sessions 1-5).*

Guidelines regarding step length of the horse

Definition

In the walk, the step of each hoof (step length) is equally long, symmetrical and ground-covering.

When increasing a horse's walking speed, the step length often (but not necessarily) also increases.

Note: Please keep in mind that it might be difficult (but not impossible) for both the horse and the horse handler to alter step length in hand, while keeping the speed constant.

A hippotherapy horse can be trained to alter step length and/or tempo.

Guidelines

11.15. *When a different step length is needed for a client, consider using a different horse.*



- 11.16. Reduce the step length of the horse when clients are unable to maintain their personal optimum posture to accommodate for the motor challenges presented by the horse, if fatigue, pain and discomfort are ruled out as reason for the compromised posture.*
- 11.17. Increased step length is advised when the client's arousal level drops, not due to fatigue.*
- 11.18. Increased step length is advised when sensory regulation is needed.*
- 11.19. Increased step length is advised when greater postural challenge is needed.*
- 11.20. Increased step length is advised when core strength needs further improvement.*
- 11.21. Increased step length is advised during later therapy sessions (session 6 onwards) in combination with different positions on the horse to challenge postural control, symmetry and balance.*
- 11.22. Increased step length is advised during later therapy sessions (session 6 onwards), in combination with different ground courses to challenge the client's postural control, symmetry and balance, for example, increasing the step length on a figure of eight.*
- 11.23. Increased step length is advised during later therapy sessions (session 6 onwards), in combination with directional changes.*
- 11.24. **Before considering increasing the step length** of the horse, the client should have a good sitting balance.*
- 11.25. **Before considering increasing the step length**, the client should have good head control or be small enough that the head can be supported safely by the therapist or equipment.*
- 11.26. **Consider starting** with a horse with shorter steps to target pelvic mobility, then progress onto a horse with longer steps, when treating **clients with diplegia**.*
- 11.27. **Consider** using a horse with long steps, that provides anterior and posterior movement, when treating **clients with diplegia**.*



11.28. Consider a change in walking speed (easier to accomplish in hand) rather than step length change within a session, when treating **clients with diplegia**.

Guidelines regarding pelvic movement facilitation

Note: Bear in mind that although the horse moves the pelvis of the client in all three dimensions, the therapist can choose a horse that emphasises movement in one plane.

For all clients with spastic CP

11.29. Increased step length from the horse, when more or different pelvic movement is needed for the client.

11.30. Limited pelvic movement of a walking client, identified through formal and ongoing assessment, should ideally be addressed by choosing a horse that provides more of that specific pelvic movement.

11.31. Follow a normal pattern of neurodevelopment regarding the progression of pelvic movements in the client, namely posterior-anterior, lateral movement and then rotation.

11.32. Provide anterior-posterior pelvic movements, when treating a client with poor dissociation between the trunk and lower extremities.

11.33. Start with the pelvic movement that the client already presents with (from a neurodevelopmental point of view). Thereafter, the therapist can also implement other treatment theories (such as vestibular stimulation and phylogenesis) to help the client reach more movement-related function.

11.34. Rotational pelvic movements may be used to treat a client with poor dissociation between the trunk and lower extremities.

For clients with quadriplegia

11.35. When pelvic-movement facilitation is needed for clients with **quadriplegia**, start with a horse that provides little rotational movement to the client and grade upwards to work towards more rotation.



For clients with hemiplegia

11.36. *When pelvic movement facilitation is needed for clients with **hemiplegia**, use a horse with good pelvic rotation to facilitate normal/even lateral flexion in the client*

12. Dosage

Definitions

Dosage encompasses duration of sessions, frequency of sessions, total number of sessions and discharge criteria.

Note: These guidelines included recommendations on the dosage of intensive blocks of hippotherapy as well.

Intensive block therapy: When clients are seen more frequently (more times per week) in a set time frame.

Note: For various reasons (such as clients that live far from therapy centres or a policy that limits the time of year that therapy is provided), therapists might decide to provide intensive block sessions to clients, for instance, only during the summer holidays.

Guidelines regarding duration of sessions

Definition: The total time (in minutes) spent in one therapy session.

12.1. *Start by presenting shorter hippotherapy sessions and progress to longer sessions, considering the **physical endurance** of each client.*

12.2. *For clients on **GMFCS levels I-III** start with sessions between 15 to 20 minutes and progress to sessions that are between 30-45 minutes long.*

12.3. *For clients on **GMFCS levels IV-V** start with 10-minute sessions during earlier therapy.*

Guidelines regarding frequency of sessions

Definition: Frequency is the number of therapy sessions per week.

12.4. *Hippotherapy sessions can be provided at a frequency of one to two sessions per week.*



Guidelines regarding total number of sessions and discharge criteria

Definition: Total number of sessions refer to the number of sessions before re-evaluation or the number of sessions before discharge.

Note: Both concepts should be specified in the therapist's protocols and should be clarified in research settings.

The number of sessions is only a guideline and must not be seen as a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

A formal re-evaluation is done to determine if any discharge criteria apply or if new therapy goals need to be set. This does not mean that the same standardised tests (that were used before therapy started) must be used.

12.5. *Although re-evaluation is a continuous process, do a formal re-evaluation between session 10 and session 20.*

12.6. *Clients are **discharged** from hippotherapy when they have reached their therapy goals set at onset of therapy and new goal setting is not possible for any reason.*

12.7. *Clients are **discharged** from hippotherapy when the client is plateauing in terms of continued skill attainment.*

12.8. *Clients are **discharged** from hippotherapy when the client is ready to integrate into riding for the disabled (RDA) or mainstream riding lessons, with some therapy support.*

12.9. *Clients are **discharged** from hippotherapy when hippotherapy is no longer safely indicated for a client, for example, when changes in medical status occur, the client developed contraindications or grown too big to be handled safely.*

12.10. *Clients are **discharged** from hippotherapy when the client does not tolerate the sessions, and therefore does not show improvement.*

12.11. *Clients are **discharged** from hippotherapy when continuation of hippotherapy is too traumatic for everyone, including the horse.*



Guidelines regarding intensive hippotherapy block sessions

12.12. *Intensive hippotherapy block sessions may be provided once a week, twice a week or daily, for a total period of one to two weeks, provided that the client can tolerate the effects of daily sessions.*

12.13. *Provide a total number of at least 12 sessions during an intensive block of hippotherapy.*

GUIDELINES REGARDING STRUCTURING PRINCIPLES

13. Ground courses

Definition

The prescribed route or path in which the horse is directed to walk or trot including riding figures (also called school figures); inclines and declines; different shapes, and sizes of figure of eights; walking over poles; and zigzag through poles, cones, or other markers.

Note: Please bear in mind that ground courses cannot be seen separate to any other hippotherapy concept and the combined effect of all hippotherapy concepts on the client must be considered by the therapist that will apply professional reasoning when treating any client.

These guidelines on ground courses are only intended as advice to be considered within treatment of a client with CP.

Guidelines

General guidelines on ground courses

13.1. *Hippotherapy starts off with the horse walking in long straight lines.*

13.2. *Ground courses with a gradual bend, can be introduced when the client can sustain an upright posture on a horse walking in straight lines.*

Note: Gradual bends can include 20 m circles, three-loop serpentines, large figures of 8 and gradual zigzag patterns.



13.3. *Ground courses with gradual bends can be introduced to clients with **hemiplegia** on **GMFCS levels I-III** earlier/sooner (sessions 1 to 5) than to clients with quadriplegia or diplegia.*

Note: the number of sessions is only an indication and not a rule. Professional reasoning from the therapists should be applied at all times when deciding on the ground course to take.

13.4. *Ground courses with sharper and smaller bends can be introduced when the client can sustain an upright posture on gradual bends.*

Note: Sharper and smaller bends can include 10 m circles, five-loop serpentine, smaller figures of 8 and sharp zigzags.

13.5. *Greater variety in ground courses can be introduced during the later stages (session 6 and onwards) of hippotherapy.*

13.6. *A greater variety in ground courses is recommended for clients on **GMFCS levels I-III** than for clients on **GMFCS levels IV-V**.*

13.7. *Use ground courses that enhance symmetry (require symmetrical responses in a client), such as straight lines, in the clients with **quadriplegia** and **hemiplegia**.*

13.8. *Where one side of the client's body is more affected than the other, also use ground courses that require asymmetrical responses in a client (such as bends and circles) to ultimately promote symmetry in the client.*

14. Manner of leading

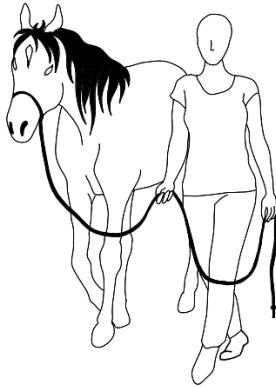
Definition

Directing the horse from the ground, either beside them (side leading) or from behind (long lining). When leading beside the horse, walk with the horse, at its shoulder or head, not ahead or behind.

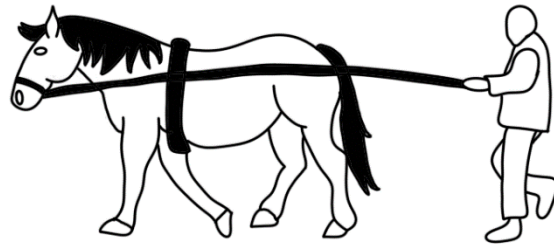
Guidelines

14.1. Use side leading or long lining within a hippotherapy session

Side leading



Long lining



15. Positioning of the client on the horse

Definition

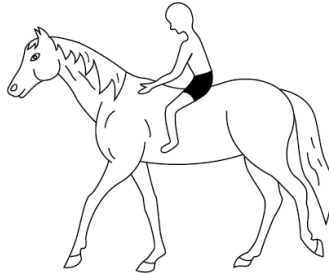
The act of putting a client in a particular position, in this case, on a horse.

Note: Bear in mind that most alternative positions are only used for children (as clients) and the needed support must be provided.

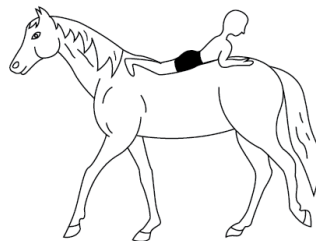
Guidelines

Positions for all GMFCS levels

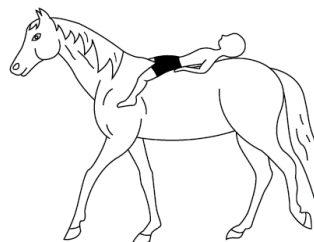
15.1. Consider forward sitting



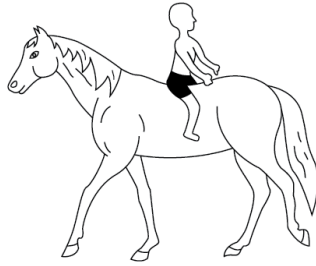
15.2. Consider a backward prone position



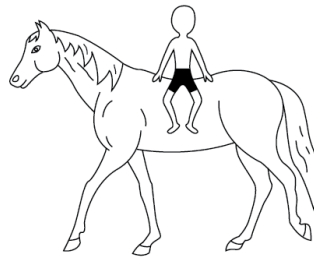
15.3. Consider a backward supine position



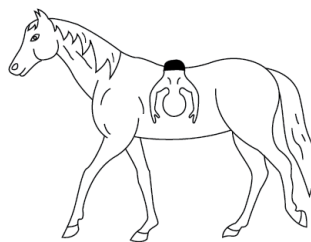
15.4. Consider backward sitting



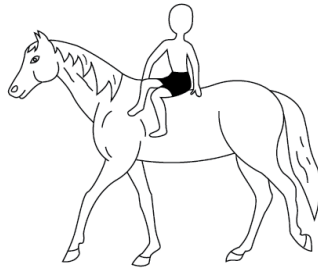
15.5. Consider side sitting



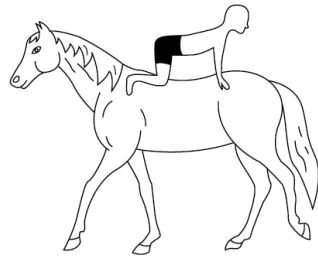
15.6. Consider prone lying "over the barrel"



15.7. Consider modified side sitting



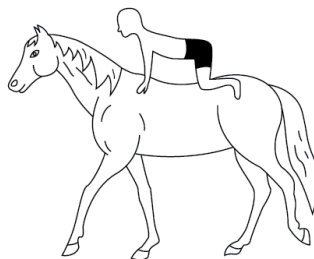
15.8. Consider all fours facing backwards



15.9. “All fours facing backwards” is not recommended for clients with diplegia **GMFCS levels IV-V.**

15.10. “Modified side sitting” is not recommended for clients with **hemiplegia GMFCS levels IV-V during earlier therapy sessions.**

15.11. Introduce “all fours facing forward” during later sessions (session 6 and onward) for clients with **quadriplegia and diplegia on GMFCS levels I-III.**





16. Horse tack

Definition

Tack is equipment or accessories that equip horses. This equipment includes items, such as saddles, stirrups, bridles, halters, reins, bits and harnesses. In this study, the focus was on tack used during therapy.

Note: Both the safety and well-being of the **client** and the **horse** should be considered when choosing tack. The tack mentioned are examples and not the focus of these guidelines. The professional reasoning behind the decision to use a certain piece of tack should be the focus of these guidelines.

When considering the seating of the client, take the amount of seating support needed by the client into consideration.

Guidelines

- 16.1. When little to no seating support is needed by all clients with spastic CP, provide a bare back pad (typically made of sheepskin or foam) or numnah (typically made of sheepskin or quilted fabric, which is usually placed under a saddle).*
- 16.2. When needed, provide moderate seating support by using, for example, a general-purpose saddle for all clients with spastic CP.*
- 16.3. When needed, consider additional support, such as rollers or pillows for clients with quadriplegia and hemiplegia on GMFCS levels IV-V.*
- 16.4. Consider a handle or strap to hold on to, such as a vaulting surcingle or granny strap, still with little to no seating support.*
- 16.5. Use safety stirrups, for all clients with spastic CP, when stirrups are needed to accomplish a specific treatment goal.*
- 16.6. A bridle can be used to lead the horse during the sessions, depending on the horse's training.*



17. Therapy equipment

Definition

Therapy equipment includes items, such as riding hats and/or rollers that are needed by a hippotherapy client to achieve the therapy goals or for safety purposes.

Note: Both the safety and wellbeing of the **client** and the **horse** should be considered when choosing the equipment. The equipment mentioned are examples and not the focus of these guidelines. The professional reasoning behind the decision to use a certain piece of equipment should be the focus of these guidelines.

Guidelines applicable to client's clothing and wearing of splints

- 17.1. If there are no contra-indications, clients wear light weight safety helmets, according to the safety regulations in your country.*
- 17.2. Clients wear long pants and any top that are comfortable, non-restricting and appropriate for the weather conditions.*
- 17.3. Clients with spastic CP wear riding boots or other supportive footwear, when stirrups are used.*
- 17.4. Clients wear any comfortable training shoes or bare feet (with or without socks), when stirrups are not used.*
- 17.5. During hippotherapy, clients wear the splints that they normally wear, provided that no harm is done to the horse or the client.*

18. Physical environment

Definition

The place in which hippotherapy is given, which includes indoor and outdoor possibilities.

Guidelines

- 18.1. Hippotherapy is conducted at safe and available facilities that are suitable for hippotherapy.*



18.2. Hippotherapy facilities should ideally, but not necessarily, include both indoor and outdoor facilities.

18.3. A mounting ramp is used to mount clients.

19. Environmental temperature

Definition

How hot or cold the place is in which hippotherapy is given.

Guidelines

19.1. The therapist's subjective perception of the average temperature that is comfortable is dependent on the geographical area where therapy is conducted.

19.2. The environmental conditions (temperature, wind, rain, or snow) are taken into consideration, when deciding if a hippotherapy session should proceed.

7.5 DISCUSSION OF THE GUIDELINES

These guidelines are discussed under the four treatment principles¹⁴⁸ used throughout to structure the guidelines in the study, namely therapeutic relationship, presentation principles, structuring principles and activity requirements.

As the guidelines from the AHA¹⁴ are the only other hippotherapy guidelines known to the researcher, she compared the guidelines developed in this study with the AHA guidelines. A major difference between the guidelines of this study and the AHA guidelines is that the AHA guidelines did not concentrate on a diagnostic group or different hippotherapy concepts. The sections covered in the AHA guidelines are:

- the therapy team, that mostly speak about the provider's responsibilities
- professionalism
- safety

7.5.1 Therapeutic relationship

This study structured four interacting concepts under therapeutic relations that require training and experience from the therapist using hippotherapy, namely *service providers, the human team members, the horse temperament and the physical handling of the client*.

The guidelines developed in this study correlate with the guidelines from the AHA regarding *the professionals* (OTs, PTs and SLPs) that provide hippotherapy, the importance of their training, the definition of side walkers and the definition of horse handler.¹⁴ Yet the AHA also mentions assistants in these three professions as hippotherapy providers and recommends one year of experience as a practicing therapist before embarking on hippotherapy training, something this study's guidelines did not address.¹⁴ Furthermore, the AHA expanded on the responsibilities and professionalism of the service providers.¹⁴ In this study, the reasoning was that therapists that are registered with the professional health council of their country already have to adhere to all the responsibilities, regulations and professionalism applicable to their specific profession and such stipulations did not need to be replicated in hippotherapy guidelines for OTs, PTs and SLPs. Therefore, these newly developed guidelines made an encompassing statement that: "*A therapist registered with the professional health and care council of their country (or as required by their country's law) could use hippotherapy as a treatment tool in an occupational therapy, physiotherapy or speech and language pathology session*".

It was evident that guidelines from this study were compiled by therapists from different countries, as the wording was broader when aspects regarding registering and training were concerned than the wording used in the AHA guidelines.¹⁴ Yet, what knowledge and expertise are needed by hippotherapy providers are still outstanding, as Wood and Fields highlighted.³

The *human team members* were mentioned in the AHA guidelines where the responsibilities of the service provider were described.¹⁴ They mentioned that the therapist is responsible for the training of the team members, that the therapist must be aware of each member's role and responsibilities and included an "equine professional" into the hippotherapy team. In contrast, Wood and Fields³ did not mention side walkers and horse handlers in their mapping review. The guidelines developed in this study also emphasise the various team

composition possibilities applicable to the different spastic CP classification groups. These diverse perspectives indicated and created an appreciation of the complexities involved in considering the therapy team. There was only one possible composition of a therapy team for clients on GMFCS levels IV-V that reached consensus from the expert panel in this study, namely a team that consists of *a therapist walking on the one side of the mounted client, a side walker on the other side and horse handler that handles the movement of the horse*. For clients on GMFCS levels I-III, the expert panel reached consensus on seven different combinations of a therapy team and thus indicates more variation in the composition of a therapy team when clients are less affected.

The *horse temperament* is mentioned by AHA as factor to be considered by the therapist when pairing the client with a horse, but it was not specified or described.¹⁴ This study's guidelines formulated specific temperamental traits that are desirable in a therapy horse when treating clients with spastic CP. Wood and Fields³ concentrated on the matching of a client to a horse rather than on the specific temperamental traits needed for a therapy horse and found the first mentioning of human-horse interaction in a study from 2004.¹⁹⁰ During the development of the guidelines in this study the experts added several explanations and "notes" to the desired temperamental traits of the horse. It was decided to include these "notes" in the final practice guidelines as it enhances the understanding of the guidelines.

Specific guidelines that were formulated in this study for the *physical handling* of the client considered support and facilitation of movement regarding the hand placement of the therapist and side walker. Neither AHA guidelines¹⁴ nor Wood and Fields³ mentioned physical handling at all. Still, this hippotherapy concept needs more specific description and research.

7.5.2 Presentation principles

The two interacting concepts under presentation principles that enable activity participation are *theoretical explanations* and *precautions*.

The scoping review (Phase 1) revealed that different studies gave different *theoretical explanations* for the hippotherapy used in each specific study. Using existing theories and frameworks during the early scientific development of complex interventions was described

by Craig et al.⁵⁰ and again confirmed that hippotherapy is in the early stages of scientific development. Comments from the expert panel in this study (Phase 3) made it apparent that therapists choose to use the theories and frameworks that are familiar to them. They were also concerned that not all the theory that applied to treatment in a therapy room are safe to implement on horseback. These comments and concerns led to the following guideline: “*The most suitable treatment frames of reference that are safe to implement on a horse should be used when treating clients, provided that the therapist is familiar with them.*” A list of seven frameworks were listed in the guidelines to be considered by therapists using hippotherapy but this does not mean that other frameworks cannot be considered. Wood and Fields³ mentioned some frameworks while the AHA¹⁴ did not mention any treatment theory or frameworks. Wood and Fields³ also found that how movement influences various body functions and structures formed an integral part of the various theoretical explanations of hippotherapy. Thus far, an overarching theoretical framework for hippotherapy does not yet exist. The identification of the 19 hippotherapy concepts in this study will contribute to the future formulation of such a theoretical framework.

In this study, 10 guidelines were developed about *precautions*. The AHA¹⁴ addressed safety more broadly and included contraindications, however, contraindications fell outside the scope of this study. Precautions that both these guidelines and the AHA¹⁴ considered important were: *contacting the treating physician, wearing a riding hat and other safety gear, having a first aid responder at hand and practicing emergency procedures.*

Guidelines developed in this study provided more specific instruction regarding precautions for clients with spastic CP than the AHA.

7.5.3 Structuring principles

Structuring principles are gradable and influence the client’s activity participation. *Ground courses, positioning, manner of leading, horse tack, therapy equipment, physical environment and temperature* are all hippotherapy concepts that were grouped under structuring principles.

Ground courses refer to the route or path in which the horse is directed to walk or trot, according to the functional outcomes that the therapist has in mind. Both in this study and

in the Wood and Fields study,³ it was clear that ground courses and the influence thereof on the client cannot be separated from the other horse movement related concepts, such as gait and speed. This influence of different hippotherapy concepts on one another makes the description, analysing and planning of a hippotherapy session complex.

Wood and Fields³ found that ground courses were mentioned in 22 of the 78 studies used in their mapping review and the AHA¹⁴ mentioned that the equine professional must know “school figures” to assist the therapist during the hippotherapy sessions but did not elaborate on it. In this study, the final transdisciplinary hippotherapy practice guidelines on ground courses were divided into general guidelines applicable to all clients with spastic CP and a guideline applicable to clients with diplegia and hemiplegia. The general guidelines on ground courses inform on when different ground courses should be introduced to clients and the guidelines on ground courses only for clients with diplegia and hemiplegia stated the enhancement of symmetrical movement of the client.

Listing various *positioning* possibilities of the client on the horse was done in this study and by Wood and Fields³ for example: facing backwards, prone and sideways, while the AHA guidelines did not mention positioning at all. The guidelines developed in this study did go a little further by listing the various positions that can be considered for use when treating the various classification groups and these were illustrated it with pictures. More details on when and how each position on horseback should be considered were not addressed and should be considered in future research.

Manner of leading refers to the position of the horse handler when directing the horse and was not mentioned by Wood and Fields³ or the AHA.¹⁴ Yet, in this study the manner of leading was mentioned in 13 scoping documents^{2,34,53,55,57,61,66,68-70,72,151,165} and, therefore, included in the list of hippotherapy concepts. In the transdisciplinary hippotherapy practice guidelines that were constructed, the only guideline regarding manner of leading was: “*Use side leading or long lining within a hippotherapy session*”. Not having more guidelines regarding manner of leading nor having any researched information on how different manners of leading affect the client or the horse when receiving hippotherapy, highlight the need for further research.

Horse tack refers to the equipment or accessories that equip horses, such as saddles, stirrups, bridles, halters, reins, bits, and harnesses. *Therapy equipment* on the other hand refers to any equipment needed by the client to stay safe or achieve therapy goals, such as riding hats or rollers used in therapy.

During the guideline development process questions and answers about the horse tack and therapy equipment were merged into one section. In the guidelines, they were again separated. However, when research and training are considered, these two concepts should remain separate as one considers the horse and the other the client.

Wood and Fields³ did not mention equipment and the AHA¹⁴ guidelines did mention that deciding on what equipment to use is the dual responsibility of the treating therapist and “equine professional”. Equipment maintenance checks were listed under the responsibilities of the treating therapist in the AHA guidelines, without discussing specific equipment.¹⁴ These guidelines focused on the suitable clothing of the clients and the wearing of splints. As with previous hippotherapy concepts more research is still needed when equipment is concerned.

Regarding tack, the guidelines formulated in this study linked the amount of seating support needed by the client to the kind of bare back pad or saddle that will give the support. The use of stirrups and the use of a bridle to lead the horse were also addressed. Tack was not mentioned separately by Wood and Fields³ and again grouped under responsibilities of therapists by the AHA.¹⁴

Physical environment is the place where the hippotherapy is provided such as indoor or outdoor arenas. Under safety guidelines the AHA¹⁴ mentions a minimum size for the arena in which hippotherapy is conducted and that additional physical space (clean and organised) is recommended for evaluation and treatment of clients when not on horseback. Wood and Fields³ did not include “physical environment” into their mapping review and for this study, the focus was only on the physical environment where mounted hippotherapy sessions took place.

Guidelines regarding *temperature* refer to how hot or cold the treatment environment is, yet the scoping review also hinted on the effect of the temperature of the horse on the client,

but this aspect was not carried through to the transdisciplinary hippotherapy practice guidelines. The AHA¹⁴ gave a temperature chart under their safety guidelines and also mentioned wind speed, while Wood and Fields³ did not mention temperature.

During the development process of these transdisciplinary hippotherapy practice guidelines for clients with spastic CP, it became apparent that “too hot” and “too cold” were relative to country and region. Opinions on when to cancel hippotherapy due to extreme weather conditions also differ. Some therapists worked in environments where a cancelled hippotherapy session could easily move to an indoor OT, PT or SLP treatment room and other therapists did not have such an option. Some therapists suggested sessions on the ground in the barn, but groundwork was outside the scope of this study and thus not included in the guideline development process. Research on how temperature affect clients might help therapists in future in their decision making of when hippotherapy should be cancelled due to temperature considerations.

7.5.4 Activity requirements

Treatment goals, activity characteristics, horse breed, horse size, horse movement and dosage.

The sheer number of *treatment goals* given by participants in the second phase of the study led to the translation of these goals into ICF terms and a representative figure incorporating all the body functions, structures, activity participation and environmental factors that might be considered when treatment goals are set for each CP classification group. The expert panel reached consensus on all figures relating to hemiplegia, diplegia and quadriplegia.

Treatment goals were outside the scope of the AHA guidelines.¹⁴ Wood and Fields³ listed 690 outcomes that were mentioned in the 78 documents in their mapping review. Translated goals in Wood and Fields’ study into ICF terms led to 517 goals related to body functions and structures, 147 related to activity participation and 26 fell outside these ICF terms and were listed as “other”. It is worth noting that most outcomes were mobility and movement related, including postural outcomes.³ This might be due to the fact that most hippotherapy providers in these studies were PTs, nonetheless, these studies are a strong proof of

concept and should lead to efficacy studies³⁷⁻³⁸ and in due time effectiveness studies,³⁸ as described in Chapter 2 of this thesis.

In this study, *activity characteristics* described all components of an activity or activities done while the client is mounted, while Wood and Fields³ distinguished between therapeutic exercises (stretching, strengthening) and therapeutic activities (functional tasks and games). Wood and Fields also noted that 100% of the studies where OTs were the hippotherapy providers mentioned therapeutic activities, but less so when the hippotherapy providers were PTs.³ In this study, activity characteristics such as exercise-related activities, games that involve stretching, eye-hand coordination activities, using augmentative communication on the horse and/or cognitive games, to name but a few, were considered for use while treating clients in different classification groups.

These guidelines confirm the notion that clients that are less affected should be able to take part in a greater variety of activities. It also emphasises the large variation of activities that can help to achieve functional goals of the clients. To address comments from the expert panel the following statement was added to the final hippotherapy practice guidelines regarding activity characteristics: “... *activities should always have a specific purpose for an individual client and aim to reach functional therapy goals*”.

A question, often asked by medical professionals, therapist colleagues and interested parents, is what *horse breed* is used for hippotherapy? In the scoping review, the horse breed used in some studies was mentioned, but these studies did not state that their horse breed is the recommended breed for hippotherapy.^{34,56,59,81,114,162} The consensus regarding *horse breed* in the transdisciplinary hippotherapy practice guidelines was that: “*There is no one preferred horse breed that is recommended for hippotherapy*”. Neither did AHA¹⁴ nor Wood and Fields³ indicate a preferred horse breed. The guidelines developed in this study, also indicate that the conformation, movement, temperament, weight-bearing ability and training of a horse are of great importance, irrespective of the breed.

Neither Wood and Fields³ nor the AHA mentioned the *size of a hippotherapy horse*. “Size of the horse” encompasses both the height of the horse and the width of the horse and in these guidelines, the height of the horse was described relative to the height of the therapist. Therapist-participants in the study from different countries had different viewpoints, some

therapists emphasised the needs of the client and did not mention the risk of injury to the therapist. Other therapists mostly focused on the ergonomic considerations, should a therapist work for a prolonged period with his/her arms above shoulder height. Therefore, to include both these viewpoints, the guidelines concluded that both the needs of the client and the safety (risk of injury) to the therapist should be considered when considering the height of the therapy horse.

A variation in horse heights was deemed appropriate for GMFCS levels I-III by the expert panel, although consensus was not reached about the statement: “*The back of the horse is in line or at the same height as the therapist's waist*”. For clients on GMFCS levels IV-V the only statement that reached consensus was: “*the back of the horse should be the same height as the therapist's chest.*” Research on how the height of the horse affect the client and how the height of the horse affect the therapist is still needed. Research of how therapist's body function (such as spinal mobility) relates to the height that they preferred to work at, might add yet another layer of understanding to the decision that has to be made regarding the height of a hippotherapy horse.

Regarding the width of the hippotherapy horse, the guidelines concentrated on the client's needs and how the width of the horse can be used for various client positions or activities, again contributing to the notion that hippotherapy concepts are used in combination with one another.

Horse movement is an act of the horse to move his/her body through different gaits, using different step lengths and/or transitions. These guidelines also inform on how the movement of the horse facilitates the pelvic movement of the client. Wood and Fields³ found that after having a client mounted on a moving horse (100% of their mapping studies), “...changing the horse gaits and speed while mounted was the second most common component, identified in 46 studies”. In their guidelines, the AHA¹⁴ gave a list of things that the horse expert should be knowledgeable about to assist the therapist in treatment and this list included horse movement, in the context of treatment, safety and horse wellbeing, but did not elaborate on details thereof.

Although the movement of the horse is a hippotherapy concept that is often mentioned when defining hippotherapy,^{2-3,14} formulating guidelines about the movement of the horse proved to be complex due to many underlying components.

For the transdisciplinary hippotherapy practice guidelines there were several groups of guidelines, namely: guidelines on general movement considerations, guidelines on the horse's gaits, repetitive transitioning between gaits, step length of the horse, and client's pelvic movement facilitation through the horse's movement. This study showed the need, and thus a gap, to list each movement component and then investigate its effect on the client. How the horse's conformation and size further influence the movement of the horse will also need to be researched. Such studies will contribute to the understanding of how the movement of the horse can be used in therapy to reach functional goals for the client.

According to Wood and Fields,³ *dosage* encompasses duration of sessions, frequency of sessions, total number of sessions and they found "considerable variation" in the dosage information that was reported in 77 of the 78 studies in their mapping review. In this study, therapist-participants and expert panel members linked the duration of a session to the physical endurance of the clients.

The total number of sessions before a formal re-evaluation is done was set between 10 and 20 sessions. This variation of 10 sessions might be due to how differently each client responds to the various treatment goals. Expert panel members commented repeatedly that therapists focus on the needs of individual clients and, therefore, practice guidelines cannot be rigid. Wood and Fields³ also commented that hippotherapy is "individualised". Although this "individualised therapy" poses difficulties when designing larger research studies, it can also contribute to the unique benefit that hippotherapy brings to OT, PT and SLP clients.

During this study's phased approach to formulate the guidelines on dosage, two more dosage-related themes emerged, that of discharge criteria and that of the dosage of intensive hippotherapy block sessions. Such intensive block sessions referred to hippotherapy where the total time spent in therapy might be shorter, for example, only during the summer holiday, with a higher frequency of sessions per week. This might be done for various reasons, such as that clients live far from therapy centres or a policy that limits the time of year that therapy is provided. The notion of intensive block sessions opened yet

another need for research that these guidelines brought to the attention of the hippotherapy world.

7.6 SUMMARY

This chapter discussed the phases of the study, from the first phase identifying and describing the 19 hippotherapy concepts. Then the second phase, enquiring about the hippotherapy practices across the world and developing guideline statements. And lastly the third phase that reached consensus on 166 transdisciplinary hippotherapy practice guidelines for clients with spastic CP.

These hippotherapy practice guidelines that were developed were discussed in relation to therapeutic relationships, presentation principles, structuring principles and activity requirements. These treatment principles should all be considered when therapists (as providers of hippotherapy) plan and execute a hippotherapy session. The number of concepts emphasise the complexity of hippotherapy as an intervention and the need for post-graduate training of hippotherapy providers to the benefit of the hippotherapy client.

The next chapter focuses on the conclusion of the study. Limitations of the study are also be discussed along with recommendations for future research.

CHAPTER 8

CONCLUSION AND RECOMENDATIONS

8.1 INTRODUCTION

This chapter concludes the study by summarising the key findings in relation to, as well as the value and contribution of the research aims and question. It also reviews the limitations of the study and proposes recommendations for future research.

As described in Chapters 1 and 2, hippotherapy is a treatment strategy that is used by OTs, PTs and SLPs to treat clients with spastic CP – the largest childhood disability group. However, before this study was conducted, there were no guidelines for OTs, PTs and SLPs on how to treat clients with spastic CP using hippotherapy. Therefore, this study aimed to develop transdisciplinary hippotherapy practice guidelines for clients with spastic CP to broaden each profession's knowledge base. From the outset of this study, it was planned that the guidelines to be developed in this study, will be transdisciplinary in nature, where all three professions use similar concepts when implementing hippotherapy with clients with spastic CP.

The motivation behind this guideline development process was that hippotherapy practice guidelines will lead to more efficient delivery of hippotherapy and a higher likelihood of reaching functional goals that will also be more cost effective for clients. Furthermore, the process followed in this study contributed to the scientific development of hippotherapy as a complex intervention.

8.2 FINDINGS

Firstly, this study identified hippotherapy as a complex intervention and contributed to the scientific development thereof. A total of 166 final transdisciplinary hippotherapy practice guidelines were developed through a phased guideline development process.

This study was done in three phases that each build onto the previous phase to develop the guidelines. The development of the guidelines was in line with the five steps advised by Rosenfeld et al.¹³ and recommendations from WHO¹¹ and SIGN.¹² Each phase was described in a separate chapter of this thesis and the contribution of the results from phase

to phase was summarised and integrated into the newly-developed transdisciplinary hippotherapy practice guidelines. The guidelines were presented in Chapter 7.

The three phases of the study contributed to the *scientific development* of hippotherapy as a construct, and inherent complexities were highlighted.

The outcome of the scoping review in Phase 1 was to identify and describe hippotherapy concepts. This phase was the first step in guideline development¹¹⁻¹³ and the creation of a treatment theory.^{38,50} The identified transdisciplinary hippotherapy concepts that contribute to the understanding of hippotherapy were used in the formulation of treatment theory, and provided a list of 19 concepts that must be taken into consideration when planning and executing hippotherapy.

Phase 2 used the concepts from Phase 1 to explore how these concepts were used by OTs, PTs and SLPs when treating clients with spastic CP. Guideline statements were developed by integrating information retrieved from participants from six different countries. The significance of this phase is that it documented the collective knowledge of therapists and provided an understanding of how hippotherapy is done, which is also required before treatment theory can be developed.

Phase 3 used the guideline statements from Phase 2 in a consensus building process. An expert panel commented and decided on the statements to be included in the final transdisciplinary hippotherapy practice guidelines for clients with spastic CP. This phase continued to identify the intervention mechanisms during the modified Delphi rounds. The final guidelines describe intervention mechanisms related to each one of the 19 hippotherapy practice guidelines for clients with spastic CP. The significance is that these guidelines not only inform hippotherapy providers on how to use hippotherapy concepts in therapy, but also open the door for further research for each guideline to be tested.

This study already contributed to the EATASA course notes that were updated in 2021, according to the structuring used in the scoping review. Dissemination of these findings occurred when the researcher presented the findings of the scoping review at the European Conference on Equine Facilitated Therapy in 2021. An article on the scoping review was submitted to the Scandinavian Journal of Occupational Therapy. Phase 2 was presented to

the Association of Chartered Physiotherapists in Equine Activities in the United Kingdom and also led to a lightning talk and poster presentation at the World Federation of Occupational Therapy congress in 2022 in Paris.

As a member of the Equine Facilitated Occupational Therapists in the United Kingdom, the researcher will also present the transdisciplinary hippotherapy practice guidelines to members of this organisation and other organisations that are represented by the expert panel members that took part in the study.

To make these results further known and to enable therapists to use the findings in practice and in future research, the researcher plans to publish the findings of every phase of this study in the nearby future.

8.3 LIMITATIONS

In this chapter, the limitations of the study are discussed.

The limitations in Phase 1 of the study link to the delineations as described in Chapter 1. As Phase 1 concentrated on the identification and description of hippotherapy concepts, it is possible that other perspectives on the nature of hippotherapy could have been overlooked.

The scoping documents only involved hippotherapy studies with spastic CP clients. Therefore, the hippotherapy concepts identified and described cannot be generalised to all hippotherapy clients.

Despite careful planning of Phase 2, no SLPs returned the questionnaires. Even after personal correspondence with the two SLP participants, their responses were not received. The SLP-voice and perspective were thus lacking in Phase 2. However, in Phase 3, three SLPs served on the expert panel.

Despite attempts to include OTs, PTs and SLPs from as many countries as possible, therapists participating in the second phase of the study came from only six countries (South Africa, United Kingdom, United States of America, Canada, Belgium and Peru). In Phase 3, the expert panel also came from six countries (South Africa, United Kingdom, United States of America, Canada, Czech Republic and Denmark). There were thus eight different countries represented in this study. No countries in Asia and the Middle East responded to

the information request during the initial snowball sampling method of the study, limiting the perspective to that of Western countries.

As no collective international list of hippotherapy practitioners exists, the participants in this study might also not be representative of all the Western countries in the world where hippotherapy is used by OTs, PTs and SLPs as treatment tool as the snowball sampling method might not have reached them all.

Although the expert panel consisted of OTs, PTs and SLPs from six different countries, they were only selected from the demographic information forms received at the beginning of the study and more experienced therapists could have been overlooked in the process.

Only therapists that were English proficient were included in the study, and possible valuable expertise from non-English speaking therapists is thus absent.

Hippotherapy can be defined as a complex intervention due to the number of interacting concepts and the number of diagnostic groups that are treated.⁵⁰ The final transdisciplinary hippotherapy practice guidelines focused on individual concepts and not on the interaction among these concepts. Therefore, the influence of these concepts on one another was acknowledged, but not addressed, as it was outside the scope of this study. This concept of interaction is something that should not be ignored by therapists using hippotherapy and could be further studied in future.

The study specifically focused on the spastic CP group across the topographical distribution of CP as a point of departure for guideline development. Therefore, it is not to be generalised to other diagnostic groups.

8.4 RECOMMENDATIONS

By identifying and describing hippotherapy concepts, the theory development of hippotherapy as complex intervention was advanced. To advance the theory further, specific movement components should also be identified, described, and researched, as such research will directly contribute to a formal theoretical framework for hippotherapy. It is further recommended that each hippotherapy concept should be researched in more detail to determine the effect thereof on the client and, where applicable, the effect thereof on the

hippotherapy horse. The next step will then be to research how these hippotherapy concepts interact and are influenced by one another.

Following a phased approach in this study to develop the hippotherapy practice guidelines, trustworthy transdisciplinary hippotherapy practice guidelines were developed that should be used when treating clients with spastic CP. It is recommended that these guidelines should be implemented by hippotherapy providers (OTs, PTs and SLPs) and that discipline-specific variations should be identified and described in future. The phased approach of this guideline development can also be followed to develop hippotherapy practice guidelines for other diagnostic groups.

Across all professions, hippotherapy still needs theoretical explanations and feasibility studies. Lastly, there is a need for a more systematic approach to the scientific development of hippotherapy in the profession-specific scopes of practice. Mobility-related proof of concept is established in PT-related scopes and can now move to effectiveness and efficacy studies, where OT- and SLP-related studies still need more proof-of-concept studies.

8.5 SUMMARY

This chapter concluded that this study produced 166 transdisciplinary hippotherapy practice guidelines for clients with spastic CP as the study set out to do.

The study contributed to the scientific development of hippotherapy by identifying and describing hippotherapy concepts and thus contributed to the theoretical understanding of hippotherapy as a complex intervention. The study also identified transdisciplinary intervention mechanisms for hippotherapy for clients with spastic cerebral palsy through a process of enquiry. Furthermore, the study emphasises the need for suitably-trained hippotherapy providers and the need to define what this training should encompass.

The final transdisciplinary hippotherapy practice guidelines identified several areas that need to be researched and investigated to further develop this complex intervention. The phased approach followed in this study provided a foundation to launch replication studies in future.

REFERENCES

1. Cook R. Brown pony series: Book one: Introduction to hippotherapy. Scotts Valley (CA): CreateSpace independent publishing platform; 2013.
2. Equine Assisted Therapy Association of South Africa. Fundamental hippotherapy course [Unpublished]. South Africa: Equine Assisted Therapy Association of South Africa; 2019.
3. Wood WH, Fields BE. Hippotherapy: a systematic mapping review of peer-reviewed research, 1980 to 2018. *Disabil Rehabil.* 2019; 43(10):1463-87. doi:10.1080/09638288.2019.1653997
4. Van Beyer V. Transdisciplinarity in health care: A concept analysis. *Nurs Forum* 2017; 52(4):339-47. doi:10.1111/nuf.12200
5. Choi BC, Pak AW. Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clin Invest Med.* 2006; 29(6):351-64.
6. Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M. A report: The definition and classification of cerebral palsy. *Dev Med Child Neurol.* 2007; 49(6):8-14. doi:10.1111/j.1469-8749.2007.tb12610.x
7. Schiariti V, Mahdi S, Bölte S. International Classification of Functioning, Disability and Health core sets for cerebral palsy, autism spectrum disorder, and attention-deficit-hyperactivity disorder. *Dev Med Child Neurol.* 2018; 60(9):933-41. doi:10.1111/dmcn.13922
8. Vitrikas K, Dalton H, Breish D. Cerebral palsy: An overview. *Am Fam Physician.* 2020; 101(4):213-20.
9. Novak I. Evidence-based diagnosis, health care, and rehabilitation for children with cerebral palsy. *J Child Neurol.* 2014; 29(8):1141-56. doi:10.1177/0883073814535503
10. Centers of Disease Control and Prevention. Data and statistics for cerebral palsy. Atlanta (GA): Centers of Disease Control and Prevention; 2018.

11. World Health Organization. WHO handbook for guideline development. 2nd ed; Geneva (CH): World Health Organization; 2014.
12. Scottish Intercollegiate Guidelines Network (SIGN). SIGN 50: A guideline developer's handbook. Edinburgh (GB): Scottish Intercollegiate Guidelines Network; 2015.
13. Rosenfeld RM, Shiffman RN, Robertson P. Clinical practice guideline development manual, 3rd ed: A quality-driven approach for translating evidence into action. Am J Otolaryngol Head Neck Surg. 2013; 148(SUPP/1):S1-S55.
doi:10.1177/0194599812467004
14. American Hippotherapy Association. American Hippotherapy Association, Inc. Statements of best practice for the use of hippotherapy by occupational therapy, physical therapy and speech-language pathology professionals. February 2021 ed. Fort Collins (CO): American Hippotherapy Association, Inc; 2021.
15. Lantelme-Faisan V, Honcu T, Dobisova A, Dvorakova T, Caskova V. Hippotherapy: A methodology of hippotherapy for cerebral palsy and central coordination disorder. Brno (CZ): The Czech Therapeutic Riding Association; 2018.
16. Engel BT, MacKinnon JR. Enhancing human occupation through hippotherapy: A guide for occupational therapists. 1st ed. Bethesda (MD): The American Occupational Therapy Association, Inc; 2007.
17. American Hippotherapy Association. Hippotherapy. Fort Collins (CO): American Hippotherapy Association; 2012.
18. Tseng S-H, Chen H-C, Tam K-W. Systematic review and meta-analysis of the effect of equine assisted activities and therapies on gross motor outcome in children with cerebral palsy. Disabil Rehabil. 2013; 35(2):89-99. doi:10.3109/09638288.2012.687033
19. Whalen CN, Case-Smith J. Therapeutic effects of horseback riding therapy on gross motor function in children with cerebral palsy: A systematic review. Phys Occup Ther Pediatr. 2012; 32(3):229-42. doi:10.3109/01942638.2011.619251

20. Zadnikar M, Kastrin A. Effects of hippotherapy and therapeutic horseback riding on postural control or balance in children with cerebral palsy: A meta-analysis. *Dev Med Child Neurol.* 2011; 53(8):684-91. doi:10.1111/j.1469-8749.2011.03951.x
21. Angoules A, Koukoulas D, Balakatounis K, Kapari I, Matsouki E. A review of efficacy of hippotherapy for the treatment of musculoskeletal disorders. *Br J Med Med Res.* 2015; 8(4):289-97. doi:10.9734/BJMMR/2015/17023
22. Marquez J, Weerasekara I, Chambers L. Hippotherapy in adults with acquired brain injury: A systematic review. *Physiother Theory and Practice.* 2020; 36(7):779-90. doi:10.1080/09593985.2018.1494233
23. Valle LMO, Nishimori AY, Nemr Kt. Speech therapy in hippotherapy. *Revista CEFAC.* 2014; 16(2):511-523. doi:10.1590/1982-0216201420712
24. Dismuke R. Rehabilitative horseback riding for children with language disorders. In: Anderson RK, Hart BL, Hart, LA, editors. *The pet connection: its influence on our health and quality of life.* Minneapolis (MN): Censhare, University of Minnesota; 1984. p. 131-140.
25. Cook R. Brown pony series: Book two: Risk management & safety in hippotherapy. Scotts Valley (CA): CreateSpace independent publishing platform; 2014.
26. Cook R. Brown Pony Series: Book four: The business of hippotherapy. Scotts Valley (CA): CreateSpace independent publishing platform; 2014.
27. Cook R. Brown pony series: Book three: Considering hippotherapy in your career plans. Scotts Valley (CA): CreateSpace independent publishing platform; 2015.
28. Cook R, Molton T. Barn rules: Companion to the brown pony series. Scotts Valley (CA): CreateSpace Independent Publishing Platform; 2014.
29. Du Plessis N, Buys TL, De Bruyn JT. The effect of hippotherapy on physiological cost index and walking speed of adolescents with diplegia. *Br J Occup Thers.* 2019; 82(10):639-45. doi:10.1177/0308022619841318
30. Jakubowska L, Kazimierska-ZajĄC M, Nowak K. The interdisciplinarity and innovativeness of methods in rehabilitation of children with cerebral palsy. *Journal of Education Culture and Society.* 2019; 10(1):125-35. doi:10.15503/jecs20191.125.135

31. Mutoh T, Mutoh T, Tsubone H, Takada M, Doumura M, Ihara M, et al. Impact of long-term hippotherapy on the walking ability of children with cerebral palsy and quality of life of their caregivers. *Front Neurol.* 2019; 10 doi:10.3389/fneur.2019.00834
32. Rosenbaum P, Eliasson AC, Hidecker MJ, Palisano RJ. Classification in childhood disability: focusing on function in the 21st century. *J Child Neurol.* 2014; 29(8):1036-45. doi:10.1177/0883073814533008
33. Wolff WL. The effect of hippotherapy on seated trunk stability [master's thesis]. Bowling Green (OH): Bowling Green State University; 2018.
34. Sunwoo H, Chang WH, Kwon JY, Kim TW, Lee JY, Kim YH. Hippotherapy in adult patients with chronic brain disorders: a pilot study. *Ann Rehabil Med.* 2012; 36(6):756-61. doi:10.5535/arm.2012.36.6.756
35. Oskoui M, Coutinho F, Dykeman J, Jette N, Pringsheim T. An update on the prevalence of cerebral palsy: A systematic review and meta-analysis. 2013; 55 doi:10.1111/dmcn.12080
36. Rosenbaum P. Cerebral palsy: what parents and doctors want to know. *BMJ.* 2003; 326(7396):970-4. doi:10.1136/bmj.326.7396.970
37. Craig P, Petticrew M. Developing and evaluating complex interventions: Reflections on the 2008 MRC guidance. *Int J Nurs Stud.* 2013; 50(5):585-7. doi:10.1016/j.ijnurstu.2012.09.009
38. Skivington K, Matthews L, Simpson SA, Craig P, Baird J, Blazeby JM, et al. Framework for the development and evaluation of complex interventions: gap analysis, workshop and consultation-informed update. *Health Technol Assess.* 2021; 25(57):1-132. doi:10.3310/hta25570
39. World Health Organization. ICF: International Classification of Functioning, Disability and Health. Geneva (CH): World Health Organization; 2001.
40. Bax M, Goldstein M, Rosenbaum P, Leviton A, Paneth N, Dan B, et al. Proposed definition and classification of cerebral palsy, April 2005. *Dev Med Child Neurol.* 2005; 47(8):571-6. doi:10.1017/S001216220500112X

41. MacLennan AHMD, Lewis SP, Moreno-De-Luca AMD, Fahey MMD, Leventer RJP, McIntyre SP, et al. Genetic or other causation should not change the clinical diagnosis of cerebral palsy. *J Child Neurol*. 2019; 34(8):472-6. doi:10.1177/0883073819840449
42. Wolting R. Classification of cerebral palsy. *Physiopedia*2019.
43. Palisano R, Rosenbaum P, Sd W, Russell D, Ep W, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol*. 1997; 39(4):214-23. doi:10.1111/dmnc.1997.39.issue-4
44. Rosenbaum P, Stewart D. The world health organization international classification of functioning, disability, and health: A model to guide clinical thinking, practice and research in the field of cerebral palsy. *Semin Pediatr Neurol*. 2004; 11(1):5-10. doi:10.1016/j.spen.2004.01.002
45. Paulson A, Vargus-Adams J. Overview of four functional classification systems commonly used in cerebral palsy. *Children*. 2017; (4):30. doi:10.3390/children4040030
46. Nandiwada DR, Dang-Vu C. Transdisciplinary health care education: Training team players. *J Health Care Poor Underserved*. 2010; 21(1):26-34. doi:10.1353/hpu.0.0233
47. Vyt A. Interprofessional and transdisciplinary teamwork in health care. *Diabetes Metab Res Rev*. 2008; 24(S1):S106-S9. doi:10.1002/dmrr.835
48. Kessel F, Rosenfield PL. Toward transdisciplinary research: Historical and contemporary perspectives. *Am J Prev Med*. 2008; 35(2, Supplement):S225-S34. doi:10.1016/j.amepre.2008.05.005
49. Rosenfield P. The potential of transdisciplinary research for sustaining and extending linkages between the health and social sciences. *Soc Sci Med* 1992; 35(11):1343-57. doi:10.1016/0277-9536(92)90038-R
50. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: The new Medical Research Council guidance. *BMJ*. 2008; 337:a1655. doi:10.1136/bmj.a1655

51. Whyte JMD, Barrett AM. Advancing the evidence base of rehabilitation treatments: A developmental approach. *Arch Phys Med Rehabil.* 2012; 93(8 Supplement):S101-S10. doi:10.1016/j.apmr.2011.11.040
52. Anderson R. New MRC guidance on evaluating complex interventions. *BMJ.* 2008; 337:a1937. doi:10.1136/bmj.a1937
53. Champagne D, Corriveau H, Dugas C. Effect of hippotherapy on motor proficiency and function in children with cerebral palsy who walk. *Phys Occup Ther Pediatr.* 2017; 37(1):51-63. doi:10.3109/01942638.2015.1129386
54. Hsieh Y-L, Yang C-C, Sun S-H, Chan S-Y, Wang T-H, Luo H-J. Effects of hippotherapy on body functions, activities and participation in children with cerebral palsy based on ICF-CY assessments. *Disabil Rehabil.* 2017; 39(17):1703-13. doi:10.1080/09638288.2016.1207108
55. Lucena-Antón D, Rosety-Rodríguez I, Moral-Munoz JA. Effects of a hippotherapy intervention on muscle spasticity in children with cerebral palsy: A randomized controlled trial. *Complement Ther Clin Pract.* 2018; 31:188-92. doi:10.1016/j.ctcp.2018.02.013
56. Yokoyama M, Kaname T, Tabata M. Hippotherapy to improve hypertonia caused by an autonomic imbalance in children with spastic cerebral palsy. *Kitasato Med Js.* 2013; 43(1):67-73.
57. McGibbon NH, Benda W, Duncan BR, Silkwood-Sherer D. Immediate and long-term effects of hippotherapy on symmetry of adductor muscle activity and functional ability in children with spastic cerebral palsy. *Arch Phys Med Rehabil.* 2009; 90(6):966-74. doi:10.1016/j.apmr.2009.01.011
58. Doherty M, Beller S, Bigart A, Evolo A, Irving E, Lamper T, et al. The effectiveness of a six week hippotherapy intervention for children with varied developmental disabilities. *Ann Arbor (MI): : ProQuest;* 2017.
59. Ribeiro MF, Espindula AP, Lage JB, Bevilacqua Júnior DE, Diniz LH, Mello EC, et al. Analysis of the electromiographic activity of lower limb and motor function in hippotherapy

practitioners with cerebral palsy. *J Bodyw Mov Ther.* 2019; 23(1):39-47.

doi:10.1016/j.jbmt.2017.12.007

60. Dziuba A, Dudek K, Kobel-Buys K, Zurek G, Smajda E. Thermovision techniques for evaluation of the effect of hippotherapy on changes in lower limb temperature in children with cerebral palsy (CP) – a pilot study. *Physiother.* 2013; 21(1):21-5. doi:10.2478/physio-2013-0019

61. El-Meniawy GH, Thabet NS. Modulation of back geometry in children with spastic diplegic cerebral palsy via hippotherapy training. *EJMHG.* 2012; 13(1):63-71.

doi:10.1016/j.ejmhg.2011.10.004

62. Lipińska-Stańczak M, Wilczyński J. Hippotherapy as a form of physiotherapy support in children with cerebral palsy in the opinion of parents. *Arch Physiother Glob Res.* 2014; 18(1):25-30. doi:10.15442/apgr.18.1.4

63. Flores FM, Dagnese F, Copetti F. Do the type of walking surface and the horse speed during hippotherapy modify the dynamics of sitting postural control in children with cerebral palsy? *Clin Biomech.* 2019; 70:46-51. doi:10.1016/j.clinbiomech.2019.07.030

64. Kwon JY, Chang HJ, Yi SH, Lee JY, Shin HY, Kim YH. Effect of hippotherapy on gross motor function in children with cerebral palsy: a randomized controlled trial. *J Altern Complement Med.* 2015; 21(1):15-21. doi:10.1089/acm.2014.0021

65. Stevens M. The effect of intensive physical therapy with hippotherapy in pediatric cerebral palsy. Ann Arbor (MI): ProQuest; 2018.

66. Shurtleff TL, Engsberg JR. Changes in trunk and head stability in children with cerebral palsy after hippotherapy: A pilot study. *Phys Occup Ther Pediatr.* 2010; 30(2):150-63.

doi:10.3109/01942630903517223

67. Shurtleff TL, Standeven J, Engsberg JR. Changes in dynamic trunk/head stability and functional reach after hippotherapy. *Arch Phys Med Rehabil.* 2009; 90(7):1185-95.

doi:10.1016/j.apmr.2009.01.026

68. Mutoh T, Mutoh T, Takada M, Doumura M, Ihara M, Taki Y, et al. Application of a tri-axial accelerometry-based portable motion recorder for the quantitative assessment of

hippotherapy in children and adolescents with cerebral palsy. *J Phys Ther Sci.* 2016; 28(10):2970-4. doi:10.1589/jpts.28.2970

69. Shurtleff TL, Engsborg JR. Long-term effects of hippotherapy on one child with cerebral palsy: A research case study. *Br J Occup Ther.* 2012; 75(8):359–66. doi:10.3349/ymj. 2014.55.6.1736

70. Moraes AG, Copetti FP, Ângelo VB, Chiavoloni LB, de David ACP. Hippotherapy on postural balance in the sitting position of children with cerebral palsy - Longitudinal study. *Physiother Theory Pract.* 2018; 36(2):259-66. doi:10.1080/09593985.2018.1484534

71. Rigby BR. Changes in cardiorespiratory responses and pelvic kinematics with hippotherapy in youth with and without cerebral palsy [dissertation]: Waco (TX): Baylor University; 2014.

72. Reubens R, Silkwood-Sherer DJ. Intervention for an adolescent with cerebral palsy during period of accelerated growth. *Pediatric Phys Ther.* 2016; 28(1):117-25. doi:10.1097/pep.0000000000000223

73. Del Rosario-Montejo O, Molina-Rueda F, Muñoz-Lasa S, Alguacil-Diego IM. Effectiveness of equine therapy in children with psychomotor impairment. *Neurología (English Edition).* 2015; 30(7):425-32. doi:10.1016/j.ridd.2016.07.015

74. Antunes FN, Pinho ASd, Kleiner AFR, Salazar AP, Eltz GD, de Oliveira Junior AA, et al. Different horse's paces during hippotherapy on spatio-temporal parameters of gait in children with bilateral spastic cerebral palsy: A feasibility study. *Res Dev Disabil.* 2016; 59:65-72. doi:10.1016/j.ridd.2016.07.015

75. Oh Y, Joung Y-S, Jang B, Yoo JH, Song J, Kim J, et al. Efficacy of hippotherapy versus pharmacotherapy in attention-deficit/hyperactivity disorder: A randomized clinical trial. *J Altern Complement Med.* 2018; 24(5):463-71. doi:10.1089/acm.2017.0358

76. Lee N, Park S, Kim J. Hippotherapy and neurofeedback training effect on the brain function and serum brain-derived neurotrophic factor level changes in children with attention-deficit or/and hyperactivity disorder. *J Exerc Nutrition Biochem.* 2017; 21(3):35-42. doi:10.20463/jenb.2017.0018

77. Lee N, Park S, Kim J. Effects of hippotherapy on brain function, BDNF level, and physical fitness in children with ADHD. *J Exerc Nutrition Biochem.* 2015; 19(2):115-21. doi:10.5717/jenb.2015.15061209
78. Marchis Z, Raducu C, Ladosi D, Jurco E, Coroian A, Coroian CO, et al. Research on hippotherapy effects in children with disabilities. *Bul Univ Agric Sci Vet Mmed Cluj-Napoca, Anim Sci Biotechnol.* 2017; 74(1):59-63. doi:10.15835/buasvmcn-asb:12213
79. Ajzenman HF, Standeven JW, Shurtleff TL. Effect of hippotherapy on motor control, adaptive behaviors, and participation in children with autism spectrum disorder: A pilot study. *Am J Occup Ther.* 2013; 67(6):653-63. doi:10.5014/ajot.2013.008383
80. Tabares C, Vicente F, Sánchez S, Aparicio A, Alejo S, Cubero J. Quantification of hormonal changes by effects of hippotherapy in the autistic population. *Neurochem J.* 2012; 6(4):311-6. doi:10.1134/S1819712412040125
81. Mutoh T, Mutoh T, Tsubone H, Takada M, Doumura M, Ihara M, et al. Impact of serial gait analyses on long-term outcome of hippotherapy in children and adolescents with cerebral palsy. *Complement Ther Clin Prac.* 2018; 30:19-23. doi:10.1016/j.ctcp.2017.11.003
82. Deutz U, Heussen N, Weigt-Usinger K, Leiz S, Raabe C, Polster T, et al. Impact of hippotherapy on gross motor function and quality of life in children with bilateral cerebral palsy: A randomized open-label crossover study. *Neuropediatrics.* 2018; 49(3):185-92. doi:10.1055/s-0038-1635121
83. Lee CW, Kim SG, Na SS. The effects of hippotherapy and a horse riding simulator on the balance of children with cerebral palsy. *J Phys Ther Sci.* 2014; 26(3):423-5. doi:10.1589/jpts.26.423
84. Lee C-W, Kim SG, Yong MS. Effects of hippotherapy on recovery of gait and balance ability in patients with stroke. *J Phys Ther Sci.* 2014; 26(2):309-11. doi:10.1589/jpts.26.309
85. Costa VrSdF, Silva HMd, Azevêdo Md, Silva ARd, Cabral LLP, Barros JdFa. Effect of hippotherapy in the global motor coordination in individuals with Down Syndrome. *Fisioter Mov.* 2017; 30(suppl 1):229-40. doi:10.1590/1980-5918.030.s01.ao22



86. Valéria Sovat de Freitas C, Hudday Mendes da S, Elioenai Dornelles A, Patrick Ramon Stafin C, André Ribeiro da S, Jônatas de França B. Hippotherapy and respiratory muscle strength in children and adolescents with Down syndrome. *Fisioterapia em Movimento* [Internet]. 2015; 28(2):373-81. [cited Access Year Access Date]]. Available from: URL
87. Lee J, Yun C-K. Effects of hippotherapy on the thickness of deep abdominal muscles and activity of daily living in children with intellectual disabilities. *J Phys Ther Sci*. 2017; 29(4):779-82. doi:10.1589/jpts.29.779
88. Ambroży T, Mazur-Rylska A, Chwała W, Ambroży D, Mucha T, Omorczyk J, et al. The role of hippotherapeutic exercises with larger support surface in development of balance in boys aged 15 to 17 years with mild intellectual disability. *Acta Bioeng Biomech*. 2017; 19(4):143-51. doi:10.5277/ABB-00776-2016-04
89. Giagazoglou P, Arabatzi F, Kellis E, Liga M, Karra C, Amiridis I. Muscle reaction function of individuals with intellectual disabilities may be improved through therapeutic use of a horse. *Res Dev Disabil*. 2013; 34(9):2442-8. doi:10.1016/j.ridd.2013.04.015
90. Macauley BL, Gutierrez KM. The effectiveness of hippotherapy for children with language-learning disabilities. *Commun Disord Q*. 2004; 25(4):205-17. doi:10.1177/15257401040250040501
91. Vermöhlen V, Schiller P, Schickendantz S, Drache M, Hussack S, Gerber-Grote A, et al. Hippotherapy for patients with multiple sclerosis: A multicenter randomized controlled trial (MS-HIPPO). *Mult Scler J*. 2018; 24(10):1375-82. doi:10.1177/1352458517721354
92. Muñoz-Lasa S, López de Silanes C, Atín-Arratibel MÁ, Bravo-Llatas C, Pastor-Jimeno S, Máximo-Bocanegra N. Effects of hippotherapy in multiple sclerosis: Pilot study on quality of life, spasticity, gait, pelvic floor, depression and fatigue. *Medicina Clínica (English Edition)*. 2019; 152(2):55-8. doi:10.1016/j.medcle.2018.11.012
93. Lindroth JL, Sullivan JL, Silkwood-Sherer D. Does hippotherapy effect use of sensory information for balance in people with multiple sclerosis? *Physiother Theory Pract*. 2015; 31(8):575-81. doi:10.3109/09593985.2015.1067266

94. Erdman EA, Pierce SR. Use of hippotherapy with a boy after traumatic brain injury: A case study. *Pediatr Phys Ther.* 2016; 28(1):109-16. doi:10.1097/PEP.0000000000000204
95. Silkwood-Sherer DJ, Killian CB, Long TM, Martin KS. Hippotherapy--an intervention to habilitate balance deficits in children with movement disorders: a clinical trial. *Phys Ther.* 2012; 92(5):707-17. doi:10.2522/ptj.20110081
96. Medical Research Council. A framework for the development and evaluation of RTCs for complex interventions to improve health. London (GB): Medical Research Council; 2000.
97. De Pauw KP. Horseback riding for individuals with disabilities: Programs, philosophy, and research. *Adapt Phys Activ Q.* 1986; 3(3):217-26.
98. Stern C, Chur-Hansen A. An umbrella review of the evidence for equine-assisted interventions. *Aust J Psychol.* 2019; 71(4):361-74. doi:10.1111/ajpy.12246
99. Stergiou A, Tzoufi M, Ntzani E, Varvarousis D, Beris A, Ploumis A. Therapeutic effects of horseback riding interventions: A systematic review and meta-analysis. *Am J Phys Med Rehabil.* 2017; 96(10):717-25. doi:10.1097/PHM.0000000000000726
100. Heipertz W. *Therapeutisches Reiten: Medizin, Pädagogik, Sport.* 1 Aufl ed. Stuttgart (DE): Franckh; 1977.
101. Heipertz W. *Therapeutic riding: Medicine, education, sports.* 2nd ed. Ottawa (ON): Greenbelt Riding Association for the Disabled; 1984.
102. Sterba JA. Does horseback riding therapy or therapist-directed hippotherapy rehabilitate children with cerebral palsy? *Dev Med Child Neurol.* 2007; 49(1):68-73. doi:10.1111/j.1469-8749.2007.0175a.x
103. Pantera E, Vernay D, Gautheron V, Laffont I, Gaviria M. Does hippotherapy improve motor function in children with cerebral palsy? Systematic review. *Ann Phys Rehabil Med.* 2015; 58(Supplement 1):e131. doi:10.1016/j.rehab.2015.07.311
104. Grockienė A, Dovidaitienė G, Kerzienė S, Stankevičius R. Influence on functional mobility and motivation of hippotherapy for people with special needs. *Veterinarija ir Zootechnika.* 2018; 076(98):29-32.

105. Léveillé A, Rochette A, Mainville C. Perceived risks and benefits of hippotherapy among parents of children currently engaged in or waiting for hippotherapy: A pilot study. *Physiother Theory Pract.* 2017; 33(4):269-77. doi:10.1080/09593985.2017.1302029
106. Peters BC, Fields BE, Erdman EA. Hippotherapy practice and safety patterns in the United States: A descriptive survey study. *J Altern Complement Med.* 2020; 26(8):743-9. doi:10.1089/acm.2020.0039
107. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. Developing and evaluating complex interventions: The new Medical Research Council guidance. *Int J Nurs Stud.* 2013; 50(5):587-92. doi:10.1016/j.ijnurstu.2012.09.010
108. American Occupational Therapy Association. Occupational therapy practice framework: Domain and process. *Am J Occup Ther.* 2014; 68(Supplement_1):S1-S48. doi:10.5014/ajot.2014.682006
109. Bertoti DB. Effect of therapeutic horseback riding on posture in children with cerebral palsy. *Phys Ther.* 1988; 68(10):1505-12.
110. Jang CH, Joo MC, Noh SE, Lee SY, Lee DB, Lee SH, et al. Effects of hippotherapy on psychosocial aspects in children with cerebral palsy and their caregivers: A pilot study. *Ann of Rehabil Med.* 2016; 40(2):230-6. doi:10.5535/arm.2016.40.2.230
111. Martín-Valero R, Vega-Ballón J, Perez-Cabezas V. Benefits of hippotherapy in children with cerebral palsy: A narrative review. *Eur J Paediatr Neurol.* 2018; 22(6):1150-60. doi:10.1016/j.ejpn.2018.07.002
112. Sterba JA, Rogers BT, France AP, Vokes DA. Horseback riding in children with cerebral palsy: Effect on gross motor function. *Dev Med Child Neurol.* 2002; 44(5):301-8. doi:10.1017/s0012162201002122
113. Casady RL, Nichols-Larsen DS. The effect of hippotherapy on ten children with cerebral palsy. *Pediatr Phys Ther.* 2004; 16(3):165-72. doi:10.1097/01.PEP.0000136003.15233.0C

114. Fizkova V, Krejci E, Svoboda Z, Elfmark M, Janura M. The effect of hippotherapy on gait in patients with spastic cerebral palsy. *Acta Univ. Palacki. Olomuc., Gymn.* 2013; 43(4):17-23. doi:10.5507/ag.2013.020
115. Peters BC, Wood W, Hepburn S, Merritt T. The feasibility and acceptability of occupational therapy in an equine environment for youth with autism spectrum disorder. *Res Autism Spectr Disord.* 2021; 80 doi:10.1016/j.rasd.2020.101695
116. Angsupaisal M, Visser B, Alkema A, Meinsma-van der Tuin M, Maathuis CGB, Reinders-Messelink H, et al. Therapist-designed adaptive riding in children with cerebral palsy: Results of a feasibility study. *Phys Ther.* 2015; 95(8):1151-62. doi:10.2522/ptj.20140146
117. Lechner HE, Kakebeeke TH, Hegemann D, Baumberger M. The effect of hippotherapy on spasticity and on mental well-being of persons with spinal cord injury. *Arch Phys Med Rehabil.* 2007; 88(10):1241-8. doi:10.1016/j.apmr.2007.07.015
118. Kang H, Jung J, Yu J. Effects of hippotherapy on the sitting balance of children with cerebral palsy: A randomized control trial. *J Phys Ther Sci.* 2012; 24(9):833-6. doi:10.1016/j.amepre.2008.05.005
119. Frevel D, Mäurer M. Internet-based home training is capable to improve balance in multiple sclerosis: A randomized controlled trial. *Eur J Phys Rehabil Med.* 2015; 51(1):23-30.
120. Kim SG, Lee C-W. The effects of hippotherapy on elderly persons' static balance and gait. *J Phys Ther Sci.* 2014; 26(1):25-7. doi:10.1589/jpts.26.25
121. Kredo T, Bernhardsson S, Machingaidze S, Young T, Louw Q, Ochodo E, et al. Guide to clinical practice guidelines: The current state of play. *Int J Qual Health Care.* 2016; 28(1):122-8. doi:10.1093/intqhc/mzv115
122. Shekelle PG, Woolf SH, Eccles M, Grimshaw J. Clinical guidelines: developing guidelines. *BMJ.* 1999; 18:593-6.

123. Secules S, McCall C, Mejia JA, Beebe C, Masters AS, L. Sánchez-Peña M, et al. Positionality practices and dimensions of impact on equity research: A collaborative inquiry and call to the community. *J Eng Educ.* 2021; 110(1):19-43. doi:10.1002/jee.20377
124. Johnson RB, Onwuegbuzie AJ. Mixed methods research: a research paradigm whose time has come. *Educ Res.* 2004; 33(7):14-26. doi:10.3102/0013189X033007014
125. Creswell JW, Creswell JD. *Research design: Qualitative, quantitative, and mixed methods approaches.* 5th ed. Thousand Oaks (CA): SAGE Publications; 2018.
126. Creswell JW. *Qualitative inquiry and research design: Choosing among five approaches.* 2nd ed. Thousand Oaks (CA): SAGE Publications; 2007.
127. Morgan DL. Pragmatism as a paradigm for social research. *Qualitative Inquiry.* 2014; 20(8):1045-53. doi:10.1177/1077800413513733
128. Amankwaa L. Creating protocols for trustworthiness in qualitative research. *J Cult Divers.* 2016; 23(3):121-7.
129. Pansiri J. Pragmatism: A methodological approach to researching strategic alliances in tourism. *Tourism and Hospitality Planning & Development.* 2005; 2(3):191-206. doi:10.1080/14790530500399333
130. Debuse D, Gibb C, Chandler C. Effects of hippotherapy on people with cerebral palsy from the users' perspective: a qualitative study. *Physiother Theory Pract.* 2009; 25(3):174-92. doi:10.1080/09593980902776662
131. Holmes AGD. Researcher positionality - a consideration of its influence and place in qualitative research - a new researcher guide. *Shanlax Int J Educ.* 2020; 8(4):1-10. doi:10.34293/education.v8i4.3232
132. Braun V, Clarke V. *Successful qualitative research: A practical guide for beginners.* Thousand Oaks (CA): SAGE Publications; 2013.
133. Burns N, Grove SK. *The Practice of Nursing Research: Conduct, Critique & Utilization.* Saunders; 2001.
134. Streubert HS, Carpenter DR. *Qualitative research in nursing: Advancing the humanistic imperative.* 2nd ed. Philadelphia (PA): Lippincott Williams & Wilkins; 1999.

135. Swedberg R. Exploratory research. In: Elman C, Gerring J, Mahoney J, editors. *The production of knowledge: Enhancing progress in social science*. Cambridge (GB): Cambridge University Press; 2020. p. 17-41.
136. Creswell JW. *Research design: Qualitative, quantitative, and mixed methods approaches*. 2nd ed. Thousand Oaks (CA): SAGE Publications; 2003.
137. De Vos AS, Strydom H, Fouché CB, Delport CSL. *Research at grass roots: For the social sciences and human services*. 4th ed. Pretoria (ZA): Van Schaik Publishers; 2011.
138. Hornby AS, Turnbull J, Lea D, Parkinson D, Phillips P, Ashby M. *Oxford advanced learner's dictionary of current English*. 8th ed. Oxford [GB]: Oxford University Press; 2010.
139. Cypress BS. Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimens Crit Care Nurs*. 2017; 36(4):253-63. doi:10.1097/DCC.0000000000000253
140. Guba EG, Lincoln YS. *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco (CA): Jossey-Bass; 1981.
141. Lincoln YS, Guba EG. *Naturalistic inquiry*. Thousand Oaks (CA): SAGE Publications; 1985.
142. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *Int J Soc Res Methodol*. 2005; 8(1):19-32. doi:10.1080/1364557032000119616
143. Levac D, Colquhoun H, O'Brien KK. Scoping studies: Advancing the methodology. *Implement Sci*. 2010; 5:69-. doi:10.1186/1748-5908-5-69
144. Peters MD, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. *Int J of Evid-Based Healthc*. 2015; 13(3):141-6. doi:10.1097/XEB.0000000000000050
145. Pope C, Mays N, Popay J *Synthesizing qualitative and quantitative health evidence: A guide to methods*. Maidenhead (GB): McGraw Hill Education; 2007

146. Oxford Learner's Dictionaries [Internet]. Oxford learner's dictionaries. Oxford (GB): Oxford University Press; 2022. Available from: <https://www.oxfordlearnersdictionaries.com/>.
147. Griffin A [Internet]. What is a horse breed. National Institute of Food and Agriculture; 2020 [cited 2022 4 July 2022].
148. Van der Reyden D, Casteleijn D, Sherwood W, De Witt P, editors. The Vona du Toit model of creative ability: Origins, constructs, principles and application in occupational therapy. Pretoria (ZA): The Vona and Marie du Toit Foundation; 2019.
149. Park ES, Rha D-W, Shin JS, Kim S, Jung S. Effects of hippotherapy on gross motor function and functional performance of children with cerebral palsy. *Yonsei Med J.* 2014; 55(6):1736-42. doi:10.3349/ymj.2014.55.6.1736
150. Oxford Dictionaries. Oxford dictionaries. Oxford (GB): Oxford University Press; 2015.
151. Honkavaara M, Rintala P. The influence of short term, intensive hippotherapy on gait in children with cerebral palsy. *EUJAPA.* 2010; 3(2):29-36. doi:10.5507/euj.2010.007
152. Kelly R. How hippotherapy benefits individuals with cerebral palsy: Ann Arbor (MI): ProQuest; 2015.
153. Koca TT, Ataseven H. What is hippotherapy? The indications and effectiveness of hippotherapy. *North Clin Istanb.* 2016; 2(3):247-52. doi:10.14744/nci.2016.71601
154. Krejci E, Janura M, Svoboda Z. The benefit of hippotherapy for improvement of attention and memory in children with cerebral palsy: A pilot study. *Acta Gymnica.* 2015; 45(1):27-32. doi:10.5507/ag.2015.004
155. Kwon J-Y, Chang HJ, Lee JY, Ha Y, Lee PK, Kim Y-H. Effects of hippotherapy on gait parameters in children with bilateral spastic cerebral palsy. *Phys Med Rehabil.* 2011; 92(5):774-9. doi:10.1016/j.apmr.2010.11.031
156. Manikowska F, Józwiak M, Idzior M, Chen PJ, Tarnowski D. The effect of a hippotherapy session on spatiotemporal parameters of gait in children with cerebral palsy - pilot study. *Ortop Traumatol Rehabil.* 2013; 15(3):253-7. doi:10.5604/15093492.1058420

157. O'Mahony R, Connolly E, Hynes P. A qualitative study of Irish parents' views on hippotherapy, including its influence on their children's home-based occupations. *IJOT*. 2019; 47(1):42-57. doi:10.1108/IJOT-11-2018-0018
158. Rigby BR, Gloeckner AR, Sessums S, Lanning BA, Grandjean PW. Changes in cardiorespiratory responses and kinematics with hippotherapy in youth with and without cerebral palsy. *Res Q Exerc Sport*. 2017; 88(1):26-35. doi:10.1080/02701367.2016.1266458
159. Romsha RP, Neeta JV, Megha SS. Effect of hippo therapy on balance and function in children with spastic diplegia. *IAIM*. 2015; 2(3):1-7.
160. Seung Mi Y, Ji Young L, Hye Yeon S, Yun Sik S, Jeong Yi K. Factors influencing motor outcome of hippotherapy in children with cerebral palsy. *Neuropediatrics*. 2019; 50(3):170-7. doi:10.1055/s-0039-1685526
161. Lacey TR, Tutunick R. The effects of hippotherapy on the gross motor functional abilities of children with cerebral palsy using clinical outcome measures and parent/guardian reported outcomes [dissertation]. Fort Myers (FL): Florida Gulf Coast University; 2018.
162. Mutoh T, Mutoh T, Tsubone H, Takada M, Doumura M, Ihara M, et al. Effect of hippotherapy on gait symmetry in children with cerebral palsy: A pilot study. *Clin Exp Pharmacol Physiol Suppl*. 2019; 46(5):506-9. doi:10.1111/1440-1681.13076
163. McGee MC, Reese NB. Immediate effects of a hippotherapy session on gait parameters in children with spastic cerebral palsy. *Pediatr Phys Ther*. 2009; 21(2):212-8. doi:10.1097/PEP.0b013e3181a39532
164. Maćków A, Małachowska-Sobieska M, Demczuk-Włodarczyk E, Sidorowska M, Szklarska A, Lipowicz A. Influence of neurophysiological hippotherapy on the transference of the centre of gravity among children with cerebral palsy. *Ortop Traumatol Rehabil*. 2014; 16(6):581-93. doi:10.5604/15093492.1135048

165. Matusiak-Wieczorek E, Małachowska-Sobieska M, Synder M. Influence of hippotherapy on body balance in the sitting position among children with cerebral palsy. *Ortop Traumatol Rehabil.* 2016; 18(2):165-75. doi:10.5604/15093492.1205024
166. Lakomy-Gawryszewska AA, Józefowicz K, Raniszewska A, Langer D, Hansdorfer-Korzon R, Bieszczad D, et al. The impact of hippotherapy on the quality of trunk stabilisation, evaluated by EMG biofeedback, in children with infantile cerebral palsy. *Polish Ann Med.* 2017; 24(1):9-12. doi:10.1016/j.poamed.2016.06.001
167. Moraes AG, Copetti F, Angelo VR, Chiavoloni LL, David AC. The effects of hippotherapy on postural balance and functional ability in children with cerebral palsy. *J Phys Ther Sci.* 2016; 28(8):2220-6. doi:10.1589/jpts.28.2220
168. Debusse D. An exploration of the effects of hippotherapy on people with cerebral palsy [doctoral thesis]. Newcastle upon Tyne (GB): University of Northumbria; 2006.
169. Park JH, Shurtleff T, Engsberg J, Rafferty S, You JY, You IY, et al. Comparison between the robo-horse and real horse movements for hippotherapy. *Biomed Mater Eng.* 2014; 24(6):2603-10. doi:10.3233/BME-141076
170. Valencia-Flores M, Cardiel MH, Santiago V, Resendiz M, Castano VA, Negrete O, et al. Prevalence and factors associated with fibromyalgia in Mexican patients with systemic lupus erythematosus. *Lupus.* 2004; 13(1):4-10.
171. Uchiyama H, Ohtani N, Ohta M. Three-dimensional analysis of horse and human gaits in therapeutic riding. *Appl Anim Behav Sci.* 2011; 135(4):271-6. doi:10.1016/j.applanim.2011.10.024
172. Garner BA, Rigby BR. Human pelvis motions when walking and when riding a therapeutic horse. *Hum Mov Sci.* 2015; 39:121-37. doi:10.1016/j.humov.2014.06.011
173. Rigby BR. Comparing the pelvis kinematics of able-bodied children during normal ambulation and when riding a therapeutic horse [doctoral thesis]. Waco (TX): Baylor University; 2009.
174. Rattray J, Jones MC. Essential elements of questionnaire design and development. *J Clin Nurs.* 2007; 16(2):234-43. doi:10.1111/j.1365-2702.2006.01573.x

175. Bhandari P [Internet]. Operationalisation /A guide with examples, pros & cons.: Scribbr; 2022 [cited 2022 2022.10.20]. Available from: <https://www.scribbr.co.uk/thesis-dissertation/operationalisation/>.
176. Crawford IM. Marketing research and information systems. Rome (IT): Food and Agriculture Organization of the United Nations; 1997.
177. Frary RB. A brief guide to questionnaire development. Blacksburg (VA): Virginia Polytechnic Institute & State University; 2003.
178. Farmer R, Oakman P, Rice P. A review of free online survey tools for undergraduate students. *MSOR Connections* 2016; 15(1):71-8. doi:doi:10.21100/msor.v15i1.311
179. Yin RK. Case study research: Design and methods. Thousand Oaks (CA): SAGE Publications; 2003.
180. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006; 3(2):77-101. doi:10.1191/1478088706qp063oa
181. Tenenbaum G, Gershgoren L, Schinke RJ. Non-numerical data as data: A positivistic perspective. *Qualitative Research in Sport, Exercise and Health.* 2011; 3(3):349-61. doi:10.1080/2159676X.2011.607182
182. Lehman DW, O'Connor K, Kovacs B, Newman GE. Authenticity. *Academy of Management Annals.* 2019; 13(1):1-42. doi:10.5465/annals.2017.0047
183. Dammann O, Friederichs KM, Lebedinski S, Liesenfeld KM. The Essence of Authenticity. *Front Psychol.* 2020; 11:629654. doi:10.3389/fpsyg.2020.629654
184. Keeney S, Hasson F, McKenna H. The Delphi technique in nursing and health research. Chichester (GB): Wiley Blackwell; 2011.
185. Akins RB, Tolson H, Cole BR. Stability of response characteristics of a Delphi panel: Application of bootstrap data expansion. *BMC Med Res Methodol.* 2005; 5(1):1-12. doi:10.1186/1471-2288-5-37
186. Olsen AA, Wolcott MD, Haines ST, Janke KK, McLaughlin JE. How to use the Delphi method to aid in decision making and build consensus in pharmacy education. *Currents in pharmacy teaching & learning.* 2021; 13(10):1376-85. doi:10.1016/j.cptl.2021.07.018



187. Rosenfeld RM, Shiffman RN. Clinical Practice Guideline Development Manual: A Quality-Driven Approach for Translating Evidence into Action. *Otolaryngol Head Neck Surg.* 2009; 140(6_suppl):S1-S43. doi:10.1016/j.otohns.2009.04.015
188. Thangaratinam S, Redman CW. The Delphi Technique. *Obstet Gynaecol.* 2005; 7(2):120-5. doi:10.1576/toag.7.2.120.27071
189. Jordan A, Kunkel D, Manganello J, Fishbein M. *Media messages and public health : A decisions approach to content analysis.* [Internet] Hoboken: Taylor & Francis; 2008.
190. Glazer HR, Clark MD, Stein DS. The impact of hippotherapy on grieving children. *J Hosp Palliat Nurs.* 2004; 6(3):171-5. doi:10.1097/00129191-200407000-00013

ANNEXURE

10.1 INTRODUCTION

The annexures that the thesis document refer to are given in this section of the document. Whenever an explanation is needed, it is given in **green**. This is done to differentiate the explanation from the text in the annexure.

The following Annexures will be given in this section:



10.2	Annexure A: Ethics approval.....	211
10.3	Annexure B: Information and informed consent – Phase 2.....	215
10.4	Annexure C: Invitation letter to the expert panel	219
10.5	Annexure D: Information interview structure – Phase 3.....	221
10.6	Annexure E: Informed consent – Phase 3	222
10.7	Annexure F: Certificates of participation in Phase 2	223
10.8	Annexure G: Certificates of participation – Phase 3.....	225
10.9	Annexure H: Consent to be mentioned by name	228
10.10	Annexure I: Hippotherapy concepts in scoping documents	230
10.11	Annexure J: First Delphi round.....	236
10.12	Annexure K: Email to hippotherapy associations and therapists.....	262
10.13	Annexure L: Demographic information form.....	266
10.14	Annexure M: Information and informed consent for demographic information	270
10.15	Annexure N: Pilot study	274
10.16	Annexure O: Qualitative Questionnaire One and Two	310
10.17	Annexure P: Consensus on exclusion	346
10.18	Annexure Q: Second Delphi round	349
10.19	Annexure R: Third Delphi round.....	428

10.20 Annexure S: Non-consensus statements.....452



10.2 ANNEXURE A: ETHICS APPROVAL

2019

 UNIVERSITEIT VAN PRETORIA UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	Faculty of Health Sciences	<p>The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.</p> <ul style="list-style-type: none"> • FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022. • IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 03/14/2020.
Approval Certificate New Application		21 November 2019
<p>Ethics Reference No.: 774/2019 Title: DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY</p>		
<p>Dear Mrs N du Plessis</p>		
<p>The New Application as supported by documents received between 2019-10-21 and 2019-11-20 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 2019-11-20.</p>		
<p>Please note the following about your ethics approval:</p>		
<ul style="list-style-type: none"> • Ethics Approval is valid for 1 year and needs to be renewed annually by 2020-11-21. • Please remember to use your protocol number (774/2019) on any documents or correspondence with the Research Ethics Committee regarding your research. • Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval. 		
<p>Ethics approval is subject to the following:</p>		
<ul style="list-style-type: none"> • The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee. 		
<p>We wish you the best with your research.</p>		
<p>Yours sincerely</p>		
		
<p>Dr R Sommers MBChB MMed (Int) MPharmMed PhD Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria</p>		
<p><i>The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)</i></p>		
<p>Research Ethics Committee Room 4-80, Level 4, Tswelopele Building University of Pretoria, Private Bag x323 Gezina 0031, South Africa Tel +27 (0)12 356 3084 Email: deepika.behani@up.ac.za www.up.ac.za</p>	<p>Fakulteit Gesondheidswetenskappe Lefapha la Disaense tsa Maphelo</p>	



Ethics approval

2020



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IORG #: IORG0001762 OMB No. 0990-0279 Approved for use through February 28, 2022 and Expires: 03/04/2023.

6 November 2020

Approval Certificate Annual Renewal

Ethics Reference No.: 774/2019

Title: DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY

Dear Mrs N du Plessis

The **Annual Renewal** as supported by documents received between 2020-10-15 and 2020-11-04 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2020-11-04 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2021-11-06.
- Please remember to use your protocol number (774/2019) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers

MBChB MMed (Int) MPharmMed PhD

Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

* The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
Room 4-80, Level 4, Tswelopele Building
University of Pretoria, Private Bag x323
Gezina 0031, South Africa
Tel +27 (0)12 356 3084
Email: deepika.behari@up.ac.za
www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tsa Maphelo



Ethics approval

2021



Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IORG #: IORG0001762 OMB No. 0990-0279 Approved for use through February 28, 2022 and Expires: 03/04/2023.

Faculty of Health Sciences Research Ethics Committee

15 October 2021

Approval Certificate Annual Renewal

Dear Mrs N du Plessis

Ethics Reference No.: 774/2019

Title: DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY

The **Annual Renewal** as supported by documents received between 2021-09-15 and 2021-10-13 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2021-10-13 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2022-10-15.
- Please remember to use your protocol number (774/2019) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Professor Werdie (CW) Van Staden
MBCbB, MMed(Psych), MD, FCPsych(SA), FTCL, UPLM
Chairperson: Faculty of Health Sciences Research Ethics Committee

* The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
Room 4-80, Level 4, Tshepo Building
University of Pretoria, Private Bag x323
Gezina 0031, South Africa
Tel +27 (0)12 358 3084
Email: deepika.behari@up.ac.za
www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tsa Maphelo





Ethics approval 2022



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Faculty of Health Sciences **Research Ethics Committee**

Approval Certificate
Annual Renewal

15 September 2022

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 18 March 2022 and Expires 18 March 2027.
- IORG #: IORG0001762 OMB No. 0990-0278 Approved for use through August 31, 2023.

Dear Mrs N du Plessis,

Ethics Reference No.: 774/2019 – Line 5

Title: DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY

The **Annual Renewal** as supported by documents received between 2022-08-22 and 2022-09-14 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2022-09-14 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2023-09-15.
- Please remember to use your protocol number (774/2019) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Dr R Sommers

MBChB, MMed (Int), MPharmMed, PhD

Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
Room 4-00, Level 4, Tswelopele Building
University of Pretoria, Private Bag x323
Gezina 0031, South Africa
Tel +27 (0)12 355 3084
Email: deop@ehc.behari@up.ac.za
www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tsa Maphelo



10.3 ANNEXURE B: INFORMATION AND INFORMED CONSENT – PHASE 2

ICD 2A

**INFORMATION & INFORMED CONSENT DOCUMENT FOR PARTICIPANT
ADMINISTERED QULITATIVE QUESTIONNAIRES**

STUDY TITLE:

Development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy

Principal Investigator: Ninette du Plessis

Supervisor: Professor Kitty Uys

Co-supervisor: Tania Buys

Institution: University of Pretoria Faculty of Health Sciences, School of Health Care Sciences, Department of Occupational Therapy.

e-mail address: ninette@lightprojects.co.za

Dear.....

DATE AND TIME OF INFORMED CONSENT DISCUSSION:

You will be contacted via e-mail to give you the opportunity to set up a virtual meeting for discussion of the questionnaires at a time that is convenient to you. Please also read the following information with regards the study and your possible participation.

Dear Mr / Ms / Mrs

1) INTRODUCTION

In the demographic information letter that you filled out, you indicated that you might be willing to take part in the next phase of my research study. You are therefore invited (should you still be willing) to fill out two qualitative questionnaires. Your participation is voluntary. I am doing this research for the purposes of a Doctor of Philosophy degree at the University of Pretoria (South Africa). The information in this document is provided to help you to decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher via e-mail or to set up a Skype meeting with the researcher. You should not agree to take part unless you are completely happy with the kind of questions that will be asked.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy (CP).

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

The two online qualitative questionnaire involves answering questions regarding your experience as a therapist in using hippotherapy as treatment strategy for clients with spastic CP. You will receive the two questionnaires one week apart.

Each questionnaire will take approximately 60 minutes. You will submit the questionnaires online once finished. We will be available to help you with the qualitative questionnaire. The researcher will keep the completed questionnaires in a safe place to make sure that only people working on the study will have access to it. Please do not write your name on the questionnaire. This will ensure that your answers are kept confidential (so nobody will know what you have answered).

The qualitative questionnaires consist of questions with regard to: The hippotherapy treatment of clients with spastic quadriplegia, diplegia and hemiplegia on the Gross Motor Functional Classification System (GMFCS) levels I to III and GMFCS levels IV to V.

4) RISK AND DISCOMFORT INVOLVED

There is no foreseeable physical discomfort or risk involved other than the time spend to complete the questionnaire. If there are questions that are too sensitive for you to answer, you do not need to answer them.

5) POSSIBLE BENEFITS OF THIS STUDY

This part of the study will help to the development of transdisciplinary hippotherapy practice guidelines for clients with spastic CP. The guidelines will benefit clients with spastic CP, therapists providing hippotherapy and researchers, and will promote future hippotherapy guideline development for other diagnostic groups.

6) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59, Telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee - certificate number 774/2019. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving humans. A copy of the Declaration may be obtained from the investigator should you wish to review it.

7) INFORMATION

If you have any questions concerning this study, you may contact: Ninette du Plessis at ninette@lightprojects.co.za or Prof Kitty Uys at kitty.uys@up.ac.za or Tania Buys at tania.buys@up.ac.za.

8) CONFIDENTIALITY

All records from this study will be regarded as confidential. All results will be published or presented in such a way that it is not possible to identify the participants.

9) COMPENSATION

You will not be paid to take part in the study. It will also not cost you anything to be part of the study. You will be provided with a certificate to state that you took part in the study and that the information in the questionnaires were derived from a scoping review done in the first phase of the study. Although, the health care professions council of some countries might allocate continuing professional development points for such participation, the researcher will only certify your participation.

Informed consent for Phase 2 in Qualtrics

The participant received the following on the first page of the online questionnaires and was only be able to continue filling out the questionnaires if they chose the block saying that they consent to take part in the study.

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.
- I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.
- I am participating willingly.

Yes I consent

No, I do not consent

Should the participant decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

10.4 ANNEXURE C: INVITATION LETTER TO THE EXPERT PANEL

Dear.....

As a result of an extensive process, you have been identified as an expert in the field with unique experience. I would therefore like to invite you to serve on a panel of experts for my PhD study.

My name is Ninette du Plessis and I am a PhD student at the University of Pretoria in South African and am busy conducting research into the development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy.

With your input, I believe that this study will contribute significantly to the worldwide scientific development of hippotherapy as an intervention therapy.

Participation in this study is voluntary. Due to the strict inclusion criteria that aimed to select the most knowledgeable and experienced therapists from different countries to form this expert panel, the number of experts for this study is restricted and your participation will be greatly appreciated.

The aim of this email is to establish whether you are willing to participate in this study, and if so, inform you of what will be required of you.

The title of the study is: DEVELOPMENT OF TRANSDISCIPLINARY HIPPO THERAPY PRACTICE GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY

The study will be conducted in three phases, as shown in the figure below. Your participation would be welcomed in the third phase of the study, commencing early in 2021.

This study aims to utilise the Delphi technique. This will require you to complete three rounds of questionnaires to establish your opinion regarding the guidelines that were developed in phase two of the study. The first step during the third phase of the study involves a Skype or Zoom meeting which will be scheduled at a time that is convenient for you. The intention of this meeting is to answer any questions, and clarify the study process. Each round of the Delphi technique will also be accompanied by a cover letter and instruction sheet. Each

round must be completed within two weeks and you will receive the questionnaires one month apart.

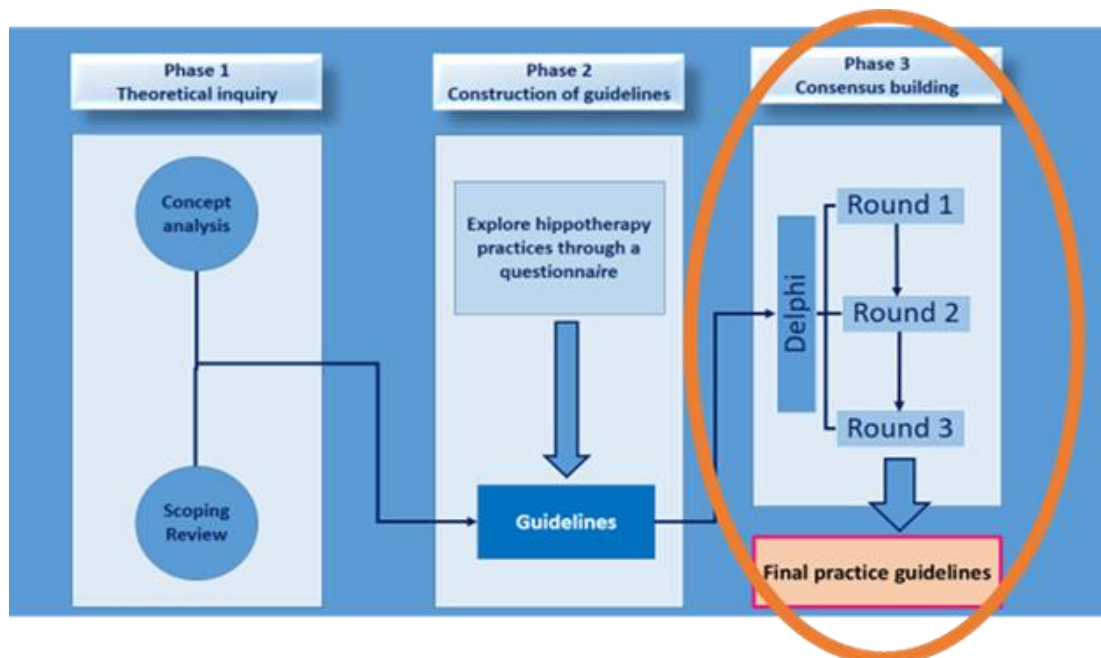
I am fully aware that taking part in my study will involve commitment and dedication of valuable time. Please know that I shall greatly appreciate your input in my study and will (with your written permission) include your name in my thesis and possible publications as part of the expert panel. Your specific opinions in the questionnaires will however stay confidential. Please consider your participation in the scientific development of hippotherapy carefully before you reply.

If you have any questions, you are most welcome to contact me before making a decision. Please could I ask you to inform me of your decision before the end of July 2020. Should you decide to not take part as a member of the expert panel in the third phase of the study, would you be willing to take part in the second phase of the study, by completing two questionnaires, that will take more or less one hour each.

Thank you for considering my request.

Warm regards

Ninette du Plessis



10.5 ANNEXURE D: INFORMATION INTERVIEW STRUCTURE – PHASE 3

An expert panel member is called an expert in this document. Allow for questions at any time. All the following are to be discussed with each expert panel member, but not necessarily in the order below.

1. Exchange greetings and pleasantries.
2. Thank the expert for agreeing to this meeting and for agreeing to take part in the study.
3. Explain the aim of the study.
4. Explain the terms used in the title of the study.
5. Explain the topographic classification combined with the Gross Motor Functional Classification System that is used in the study.
6. Explain the three phases of the study and what has been done in Phase 1 and Phase 2.
7. Explain Phase 3 (Delphi technique) and what is expected from the expert.
8. Tell the expert that there will be three rounds.
9. Tell the expert that there will be feedback emails in between rounds.
10. Tell the expert that they can withdraw from the study at any time.
11. Ask the expert if they have any questions?
12. Give the expert their unique expert number to be used during the study.
13. An email containing the hyperlink to the first Delphi round will be sent after the interview.
14. Thank the expert for their time.

10.6 ANNEXURE E: INFORMED CONSENT – PHASE 3

This informed consent message was given before each Delphi round in the Qualtrics programme.

INFORMED CONSENT DOCUMENT TO SERVE ON THE EXPERT PANEL


I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study. I have also received, read and understood the above written information about the study. I have had adequate time to ask questions and I have no objections to participate in this study. I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results. I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status. I am participating willingly.

- Yes I consent
- No, I do not consent

Should the participant decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

10.7 ANNEXURE F: CERTIFICATES OF PARTICIPATION IN PHASE 2

Participants that completed both parts of the questionnaire received this certificate



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SCHOOL OF HEALTH CARE SCIENCES
DEPARTMENT OF OCCUPATIONAL THERAPY

Hereby certifies that

Took part in a PhD study
From
University of Pretoria
By completing and commenting on two questionnaires
September 2020 to November 2020

CPE description : The therapist completed two questionnaires on different hippotherapy concepts with regard to the spastic cerebral palsy population that were identified through a scoping review. The participants had to familiarise themselves with the hippotherapy components mentioned (a learning opportunity) before completing the lengthy questionnaires. Completion took on average four hours. Taking part in this study adds to the knowledge of the participants and gather their opinions electronically (in the same manner as a discussion group would have done) and can thus be seen as continued professional development.

Ethical clearance number: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.


Prof Kitty/Uys
Head of Department



Participants that completed only one part of the questionnaire received this certificate.



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SCHOOL OF HEALTH CARE SCIENCES
DEPARTMENT OF OCCUPATIONAL THERAPY

Hereby certifies that

Took part in a PhD study
From
University of Pretoria

By completing and commenting on one questionnaire

September 2020 to November 2020

CPE description : The therapist completed one questionnaire on different hippotherapy concepts with regard to the spastic cerebral palsy population that were identified through a scoping review. The participants had to familiarise themselves with the hippotherapy components mentioned (a learning opportunity) before completing the lengthy questionnaires. Completion took on average two hours. Taking part in this study adds to the knowledge of the participants and gather their opinions electronically (in the same manner as a discussion group would have done) and can thus be seen as continued professional development.

Ethical clearance number: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.


Prof Kitty Nys
Head of Department



10.8 ANNEXURE G: CERTIFICATES OF PARTICIPATION – PHASE 3

Round one



SCHOOL OF HEALTH CARE SCIENCES
DEPARTMENT OF OCCUPATIONAL THERAPY

Hereby certifies that

Took part as an hippotherapy expert in a PhD study
From

University of Pretoria

**By completing and commenting in the first Delphi round
as an hippotherapy expert panel member**

August 2021 to September 2021

CPE description: The therapist completed a questionnaires on the exclusion or inclusion of possible hippotherapy practice guidelines for clients with spastic cerebral palsy. The participants had to familiarise themselves with the previous phases of the study through an interview with the researcher (a learning opportunity) before completing and commenting on the lengthy questionnaire. Completion took on average four hours.

Taking part in this study gather panel member's opinions electronically (in the same manner as a discussion group would have done) and can thus be seen as continued professional development.

Ethical clearance number for the study: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.


Prof Kitty Uys
Head of Department



Round two



SCHOOL OF HEALTH CARE SCIENCES
DEPARTMENT OF OCCUPATIONAL THERAPY

Hereby certifies that

Took part as an hippotherapy expert in a PhD study
From the
University of Pretoria

**By completing and commenting in the second Delphi round
as an hippotherapy expert panel member**

November 2021 to December 2021

CPD description: The therapist completed a questionnaire on the exclusion or inclusion of possible hippotherapy practice guidelines for clients with spastic cerebral palsy. Completion took on average one hour.

Taking part in this study gather panel member's opinions electronically (in the same manner as a discussion group would have done) and can thus be seen as continued professional development.

Ethical clearance number for the study: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.

Prof Kitty Uys
Head of Department



Round three



SCHOOL OF HEALTH CARE SCIENCES
DEPARTMENT OF OCCUPATIONAL THERAPY

Hereby certifies that

Took part as an hippotherapy expert in a PhD study
From the

University of Pretoria

**By completing the third Delphi round as an hippotherapy
expert panel member**

February 2022 to March 2022

CPD description: The therapist completed a questionnaire on the exclusion or inclusion of possible hippotherapy practice guidelines for clients with spastic cerebral palsy. Completion took on average one hour.

This study gathered panel member's opinions electronically (in the same manner as a discussion group would have done) and can thus be seen as continued professional development.

Ethical clearance number for the study: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.


Prof Kitty Uys
Head of Department



10.9 ANNEXURE H: CONSENT TO BE MENTIONED BY NAME



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

School of Health Care Sciences

Department of Occupational Therapy

**Permission to be mentioned as an expert panel member in acknowledgements
and publications**

Title of the study:

**DEVELOPMENT OF TRANSDISCIPLINARY HIPPOThERAPY PRACTICE
GUIDELINES FOR CLIENTS WITH SPASTIC CEREBRAL PALSY**

Dear expert panel member

I am writing a PhD thesis to be handed in at the University of Pretoria by the end of 2022 and would like your permission to acknowledge your contribution as an expert panel member by printing your name in the acknowledgement section and in the guideline Annexure. The requested permission extends to any future revisions and editions of my thesis and articles stemming from this work.

Thank you very much

Ninette du Plessis

Occupational therapist and PhD candidate



PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

Written permission

I

Hereby give permission that my name, surname and country may be mentioned in acknowledgement sections of any documents and publications linked to this PhD study.

Any opinion I expressed in the comment section, email or verbally in and during this study from 2019 to 2022 will forever be anonymous.

Please type your name and surname as you would like it to be used.

.....

Please type the name of your profession in the format that you would like it to be used.

.....

Please provide the name of your country.

.....

Ethical clearance number for the study: 774/2019.

Granted by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus. They can be contacted at: + 27 (0)12 356 3084 / +27 (0)12 356 3085.

.....
Signature

.....
Date

10.10 ANNEXURE I: HIPPO THERAPY CONCEPTS IN SCOPING DOCUMENTS

1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
1. Antunes (2016) (Article)	Different horse's paces during hippotherapy on spatio-temporal parameters of gait in children with bilateral spastic cerebral palsy: A feasibility study	X	X				X			X			X	X	X				X	X
2. Champagne (2017) (Article)	Effect of hippotherapy on motor proficiency and function in children with cerebral palsy who walk	X	X						X	X	X		X	X	X	X	X		X	X
3. Debuse (2009) (Article)	Effects of hippotherapy on people with cerebral palsy from the users' perspective: a qualitative study	X	X				X			X				X						
4. Del Rosario-Montejo (2015) (Article)	Effectiveness of equine therapy in children with psychomotor impairment	X							X	X			X	X						X
5. Deutz (2018) (Article)	Impact of hippotherapy on Gross Motor Function and Quality of Life in children with bilateral cerebral palsy: A randomized open-label crossover study	X	X							X				X			X			
6. Doherty (2017) (Dissertation)	The effectiveness of a six week hippotherapy intervention for children with varied developmental disabilities	X	X	X		X	X		X	X	X		X	X	X				X	X
7. Du Plessis (2019) (Article)	The effect of hippotherapy on physiological cost index and walking speed of adolescents with diplegia	X	X			X	X			X		X	X	X						
8. Dziuba (2013) (Article)	Thermovision techniques for evaluation of the effect of hippotherapy on changes in lower limb temperature in children with cerebral palsy (CP) – a pilot study					X				X		X		X			X	X		
9. EATASA (2019)	Course notes	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X



1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
(Course notes)																				
10. El-Meniawy (2012) (Article)	Modulation of back geometry in children with spastic diplegic cerebral palsy via hippotherapy training	X					X	X		X	X		X	X		X			X	X
11. Fizkova (2013) (Article)	The effect of hippotherapy on gait in patients with spastic cerebral palsy	X	X		X		X	X	X	X			X	X	X		X			
12. Flores (2019) (Article)	Do the type of walking surface and the horse speed during hippotherapy modify the dynamics of sitting postural control in children with cerebral palsy?		X			X	X		X	X			X	X	X		X			X
13. Grockienė (2018) (Article)	Influence on functional mobility and motivation of hippotherapy for people with special needs	X	X	X			X			X	X	X		X				X	X	
14. Honkavaara (2010) (Article)	The influence of short term, intensive hippotherapy on gait in children with cerebral palsy	X	X							X	X	X	X	X		X			X	X
15. Hsieh (2017) (Article)	Effects of hippotherapy on body functions, activities and participation in children with cerebral palsy based on ICF-CY assessments	X	X	X		X	X	X	X	X		X	X	X	X					X
16. Jakubowska (2019) (Thesis)	The interdisciplinary and innovativeness of methods in rehabilitation of children with cerebral palsy	X		X			X			X			X					X		
17. Kelly (2015) (Thesis)	How hippotherapy benefits individuals with cerebral palsy	X	X						X	X	X		X		X			X		
18. Koca (2016) (Article)	What is hippotherapy? The indications and effectiveness of hippotherapy.	X	X				X			X	X		X							
19. Krejčí (2015) (Article)	The benefit of hippotherapy for improvement of attention and memory in	X								X				X						



1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
	children with cerebral palsy: A pilot study																			
20. Kwon (2015) (Article)	Effect of hippotherapy on gross motor function in children with cerebral palsy: a randomized controlled trial	X	X			X	X			X		X	X	X			X		X	X
21. Kwon (2011) (Article)	Effects of hippotherapy on gait parameters in children with bilateral spastic cerebral palsy	X	X			X				X		X	X	X			X		X	X
22. Lacey (2018) (Thesis)	The effects of hippotherapy on the gross motor functional abilities of children with cerebral palsy using clinical outcome measures and parent/guardian reported outcomes	X	X				X			X	X	X		X				X		
23. Lakomy-Gawryszewsk (2017) (Article)	The impact of hippotherapy on the quality of trunk stabilisation, evaluated by EMG biofeedback, in children with infantile cerebral palsy	X								X	X			X						
24. Lipińska-Stańczak (2014) (Article)	Hippotherapy as a form of physiotherapy support in children with cerebral palsy in the opinion of parents.	X					X		X	X	X		X							
25. Lucena-Anton (2018) (Article)	Effects of a hippotherapy intervention on muscle spasticity in children with cerebral palsy: a randomized controlled trial.	X	X				X		X			X	X	X	X	X	X			X
26. Maćków (2014) (Article)	Influence of neurophysiological hippotherapy on the transference of the centre of gravity among children with cerebral palsy	X	X			X	X	X	X	X	X		X	X	X					
27. Manikowska (2013) (Article)	The effect of a hippotherapy session on spatiotemporal parameters of gait in children with cerebral palsy - pilot study	X					X		X	X	X			X						



1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
28. Matusiak-Wieczorek (2016) (Article)	Influence of hippotherapy on body balance in the sitting position among children with cerebral palsy	X	X							X			X	X	X	X	X			
29. McGee (2009) (Article)	Immediate effects of a hippotherapy session on gait parameters in children with spastic cerebral palsy	X							X	X		X	X	X				X		
30. McGibbon (2009) (Article)	Immediate and long-term effects of hippotherapy on symmetry of adductor muscle activity and functional ability in children with spastic cerebral palsy	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X
31. Moraes (2018) (Article)	Hippotherapy on postural balance in the sitting position of children with cerebral palsy - Longitudinal study	X	X			X	X	X	X	X		X	X	X	X	X	X			X
32. Mutoh (2019) (Article)	Effect of hippotherapy on gait symmetry in children with cerebral palsy: A pilot study	X			X								X	X			X			
33. Mutoh (2019) (Article)	Impact of long-term hippotherapy on the walking ability of children with cerebral Palsy and quality of life of their caregivers	X				X	X			X			X	X			X			
34. Mutoh (2018) (Article)	Impact of serial gait analyses on long-term outcome of hippotherapy in children and adolescents with cerebral palsy	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	
35. Mutoh (2016) (Article)	Application of a tri-axial accelerometry-based portable motion recorder for the quantitative assessment of hippotherapy in children and adolescents with cerebral palsy	X	X				X	X		X			X	X	X	X	X		X	X
36. O'Mahony (2019) (Article)	A qualitative study of Irish parents' views on hippotherapy, including its influence on their children's home-based occupations	X								X	X			X						



1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
37. Park (2014) (Article)	Effects of hippotherapy on gross motor function and functional performance of children with cerebral palsy	X	X						X	X	X		X	X				X	X	
38. Reubens (2016) (Article)	Intervention for an adolescent with cerebral palsy during period of accelerated	X	X			X	X		X	X	X		X	X	X	X	X		X	X
39. Ribeiro (2019) (Article)	Analysis of the electromyographic activity of lower limb and motor function in hippotherapy practitioners with cerebral palsy			X	X	X	X		X	X		X	X	X			X		X	X
40. Rigby (2017) (Article)	Changes in cardiorespiratory responses and kinematics with hippotherapy in youth with and without cerebral palsy	X	X				X		X	X			X	X						X
41. Rigby (2014) (Dissertation)	Changes in cardiorespiratory responses and pelvic kinematics with hippotherapy in youth with and without cerebral palsy	X	X						X	X	X	X	X	X			X			X
42. Romsha (2015) (Article)	Effect of hippo therapy on balance and function in children with spastic diplegia	X					X			X				X			X			
43. Seung Mi (2019) (Article)	Factors influencing motor outcome of hippotherapy in children with cerebral palsy	X	X			X				X			X	X	X		X	X	X	X
44. Shurtleff (2012) (Article)	Long-term effects of hippotherapy on one child with cerebral palsy: a research case	X	X				X	X	X	X			X	X		X	X			X
45. Shurtleff (2010) (Article)	Changes in trunk and head stability in children with cerebral palsy after hippotherapy: A pilot study	X	X			X	X	X	X	X		X	X	X		X	X			
46. Shurtleff (2009) (Article)	Changes in dynamic trunk/head stability and functional reach after hippotherapy	X	X	X		X	X	X	X	X			X	X						
47. Silkwood-Sherer	Hippotherapy-an intervention to habilitate balance deficits in children with movement disorders: a clinical trial	X	X							X			X	X					X	X



1 st Author (Year)	Title of study	Service provider	Human team members	Horse temperament	Horse breed	Horse size	Horse movement	Ground courses	Positioning of the client	Theoretical explanations	Treatment goals	Precautions	Activity characteristics	Dosage	Physical handling	Manner of leading	Physical environment	Temperature	Therapy equipment	Horse tack
(2012) (Article)																				
48. Stevens (2018) (Dissertation)	The effect of intensive physical therapy with hippotherapy in pediatric cerebral palsy	X	X				X		X	X	X		X	X	X					X
49. Sunwoo (2012) (Article)	Hippotherapy in adult patients with chronic brain disorders: a pilot study	X	X		X		X		X	X	X		X	X	X	X	X		X	
50. Wolff (2018) (Thesis)	The effect of hippotherapy on seated trunk stability	X	X						X	X			X	X						
51. Yokoyama (2013) (Article)	Hippotherapy to improve hypertonia caused by an autonomic imbalance in children with spastic cerebral palsy	X	X		X	X	X	X		X			X	X						X



10.11 ANNEXURE J: FIRST DELPHI ROUND

Explanations of how the guideline statements were presented to the expert panel will be given in green and was not part of the document presented to the expert panel members in the first Delphi round.

Introduction given to the expert panel when opening the survey form.

During the first phase of this study a scoping review identified the hippotherapy concepts listed in the table below.

Therapeutic relationships	Presentation principles	Structuring principles	Activity requirements
Therapists <ul style="list-style-type: none"> • OTs • PTs • SLPs 	Theoretical framework	Treatment goals	Ground courses in which the horse is directed to walk
Therapy team <ul style="list-style-type: none"> • Therapist • Side walker • Horse handler 	Precautions	Activity characteristics	Kind of leading
Horse Temperament		Horse breed	Positioning
Amount of physical support given to the client		Horse size	Horse tack
		Horse movement	Equipment
		Dosage <ul style="list-style-type: none"> • Session length • Frequency • Total number of sessions 	Physical environment
			Temperature

In the second phase of the study, 10 therapists (occupational therapists, physiotherapists and speech and language pathologists) from six countries completed two questionnaires on the application of these concepts in treatment of clients in the spastic (as described by the International Classification of Function, Disability and Health) cerebral palsy (CP) groups.

Where applicable a topographic classification (quadriplegia, hemiplegia and diplegia) was used in combination with a functional classification, namely the Gross Motor Functional Classification System (GMFCS). A summary of both these classifications can be found in the appendices.

Possible hippotherapy practice guidelines were formulated on the basis of the questionnaire answers and the scoping review. The guidelines list every answer – no reply was omitted.

In phase three of the study expert panel members are asked to evaluate each possible guideline. They then indicate whether they agree or disagree, or if a guideline needs re-evaluation.

The guidelines are recommended advice and are not enforceable by law. Each therapist should use their professional reasoning in treatment when considering this advice.

The informed consent

I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study. I have also received, read and understood the above written information about the study. I have had adequate time to ask questions and I have no objections to participate in this study. I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results. I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.

I am participating willingly.

- Yes, I consent
- No, I do not consent

Should the expert panel member have decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

Explanation of how each question were presented

The following question was presented in the Qualtrics programme after each guideline statement, but it is not repeated each time in this Annexure to save space.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- Agree
- Disagree
- Maybe

Should an expert panel choose “agree” or “disagree” the programme took them to the question:

Would you like to comment?.....

Should and expert panel member choose “maybe” the programme took them to the statement:

Please comment.....

Therapeutic relationships

1. Therapists

Guideline statements regarding therapist: providing hippotherapy as treatment strategy.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 1.1 A therapist registered with the professional health and care council of their country executes every hippotherapy session.
- 1.2 Before applying hippotherapy, therapists attend a course recognised by either the professional health and care council or the hippotherapy association of their country.

2. Hippotherapy team

Guideline statements on the size and composition of the hippotherapy team

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 2.1 A team of three people conducts treatment of clients on GMFCS levels IV and V.
- Therapists on one side of the horse
 - One side walker on the other side of the horse
 - Horse handler that handles the horse.
- 2.2 Variation in the composition of the team might be applicable for clients on GMFCS levels I, II or III.
- a) A team of four people:
- The therapist giving guidance (not hands on)
 - Two side walkers walking on each side of the horse
 - A horse handler that handles the horse.
- b) A team of three people:
- The therapist on one side of the horse (performing hands on therapy),
 - A side walker on the other side of the horse.
 - A horse handler that handles the horse.
- c) A team of three people:
- The therapist on one side of the client (performing no hands on therapy),
 - A side walker on the other side of the client
 - A horse handler that handles the horse.
- d) A team of three
- A therapist
 - A parent may perform the role of a side walker.
 - A horse handler should handle the horse.
- e) A team of two people:
- The therapist performs hands on therapy
 - A horse handler that handles the horse.
 - There are no side walkers.
- f) A team of two
- Two therapists walking on either side of the client

- A horse handler handles the horse.

3. Horse Temperament

With the definitions in mind please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines

Temperamental trait	Definition of the trait
Attentive to the hippotherapy client	How observant the horse is to the rider or client.
Attentive to surroundings	How observant the horse is to the environment.
Active involved	Characterized by being involved in the session.
Bombproof	<ul style="list-style-type: none"> • Not overtly tactile, sound or visually sensitive • Not flighty and does not spook easily • Can be described as robust and confident <p>Definitions of words used: Robust: sturdy, tough, steady Confident: how safe and secure the horse seems to be</p>
Unruffled	Responds in a composed, unmoved and controlled manner to external stimuli or demands.
Cooperative	Responds well to handler, attentive, easy to correct.
Even-tempered	Has an even, calm state of mind and is not easily disturbed or annoyed.

With these definitions in mind please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

Guideline statements regarding a hippotherapy horse's temperament:

- 3.1 Use a hippotherapy horse is attentive to clients on all the GMFCS levels.
- 3.2 Use a hippotherapy horse is attentive to the surroundings when treating clients on GMFCS levels I-III.
- 3.3 Use a hippotherapy horse that is bombproof when treating clients on GMFCS levels I-III.
- 3.4 Use a hippotherapy horse is bombproof and unruffled GMFCS levels IV-V, because this group is likely to display unexpected behaviour and might need more physical manipulation from the therapist and side walker.
- 3.5 Use a hippotherapy horse that is cooperative when treating clients with CP on all GMFCS levels.
- 3.6 Use an even-tempered horse when treating clients on all GMFCS levels, this is even more important when treating clients on the GMFCS levels IV-V.

- 3.7 Use a hippotherapy horse that is actively involved, yet unruffled when treating clients with hemiplegia or diplegia.
- 3.8 Use a hippotherapy horse that is actively involved, yet unruffled when treating clients on GMFCS levels I-III.

4. Physical support

Physical handling of clients involves, stabilising the client and facilitation of movement.

Guideline statements regarding physical handling of the client

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 4.1 Hands-on support for clients can be given at their:
 - a) Shoulders
 - b) Pelvis
 - c) Thighs
 - d) Knees
 - e) Calves
 - f) Ankles
 - g) Other? Please specify
- 4.2 Therapists give hands-on support to clients on GMFCS levels I to III only as needed.
- 4.3 Therapists give some form of hands-on support throughout every hippotherapy session to clients on GMFCS levels IV to V for safety purposes.
- 4.4 The positioning of the client will determine where stability and thus physical support is needed i.e. when the client is in prone and bears weight through their upper extremities, elbow support and/or shoulder support might be needed.
- 4.5 Therapists move their hands to a different key point of control or lessen support when the client start leaning into the support.
- 4.6 Hands-on support should stabilise and/ or facilitate but not interfere with posture and movement.



- 4.7 Therapists consider maximum movement of their clients when choosing the key point of control without compromising safety.
- 4.8 When gait belts are used, the therapist keeps contact with the belt even if no hands-on support or facilitation is needed.

Presentation principles

5. Theoretical framework

Guideline statements regarding the frame of reference applicable to hippotherapy

Please select agree, disagree or maybe on the inclusion of this theoretical framework into the final hippotherapy practice guidelines.

- 5.1 The following theoretical frameworks are used within hippotherapy.
- a) Biomechanical Frame of Reference for Positioning Children for Functioning
 - b) Cognitive Disability Frame of Reference (Claudia Allen)
 - c) Dynamic systems theory
 - d) Ecology of Human Performance (EFP) (Winnie Dunn)
 - e) Enhance Childhood Occupations
 - f) Enhance social participation
 - g) Model of Creative Ability (Vona du Toit)
 - h) Model of Human Occupation (Kielhofner)
 - i) Motor Skill Acquisition
 - j) Neurodevelopmental Treatment (Bobath)
 - k) Sensory Integration (Ayres)
 - l) Vojta's rehabilitation (Vojta)
 - m) Other? Please specify

6. Precautions

Guideline statements regarding precautions

The following precautions are taken into consideration when treating clients

- 6.1 Do additional investigation, such as contacting the physician, before treating a client.
- 6.2 Add an extra side walker to the team to support the client.



- 6.3 Give the client extra verbal instructions on positions and functional activities while mounted
- 6.4 Regular practising of emergency dismounts within the team with a specific client in mind
- 6.5 Regular team practice of mounting and dismounting, irrespective of what clients are treated.
- 6.6 Adapt positioning due to adductor tightness
- 6.7 Give hands-on postural support
- 6.8 Use alternative mounting procedures
- 6.9 Seek alternative head protection (not standard riding hats) to accommodate poor head control
- 6.10 Allocated first aider (could be therapist) before use of equine.
- 6.11 Other?

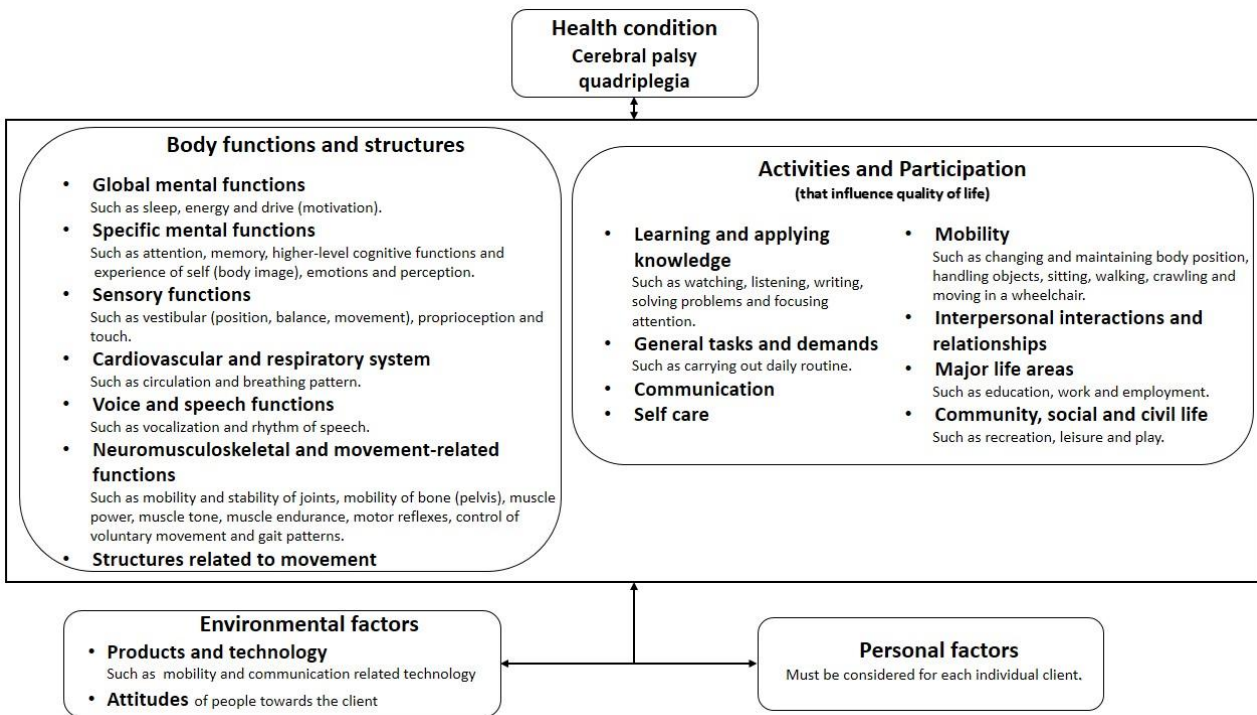
Activity requirements

7. Treatment goals

All mentioned goals were tabulated in a graph for each diagnostic group using ICF terminology.

- 7.1 To formulate treatment goals for clients with quadriplegia the following graph can be used.

*Please select agree, disagree or maybe on the inclusion of this graph into the final hippotherapy practice guidelines.
Please list items in the graph that you want to change and give a reason.*



The following goals are **examples** of how the graph can be used to formulate goals. You will only indicate if you agree or disagree on the graph. Not on the example goals.

Example 1: Improve control of voluntary upper limb movements within 12 sessions of hippotherapy to enable the client to dress upper body with assistance from one person.

Example 2: For GMFCS I or II or III: After 10 sessions of hippotherapy the client must be able to maintain a pencil grasp on a build-up pencil for five minutes at a time while moving the hand to complete a pre-writing pattern. (Improve complex movements to improve participation in school activities).

Example 3: For GMFCS IV or V: The client will be encourage to vocalise a sound to tell the horse to walk on (a voice function) instead of screaming and flapping his arms (regulate emotions) in every session. After 12 sessions of hippotherapy, the client will be able to vocalise appropriately to get the horse to walk on.

Example 4: For GMFCS IV or V: The client will have sufficient control of the external muscles of the eye to use eye gaze technology to choose what they would like to eat for breakfast after 20 hippotherapy sessions.

After the expert panel member indicated “agree, disagree or maybe” on the inclusion of the graph in the final hippotherapy practice guidelines the following question were asked:

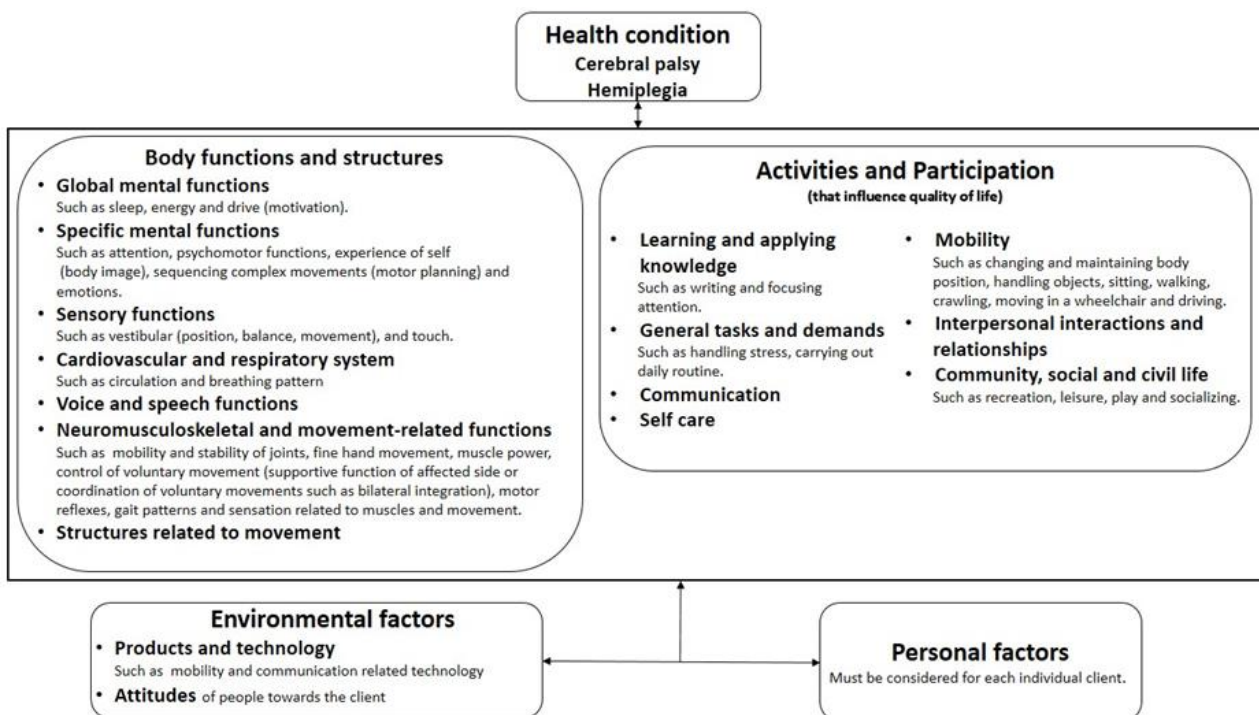
Please indicate any proposed changes to the graph, if applicable.....

This question was added to 7.2 and 7.3 as well.

7.2 To formulate treatment goals for clients with CP-hemiplegia the following graph can be used.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

Please list items in the graph that you want to change and give a reason.



The following goals are **examples** of how the graph can be used to formulate goals. You only indicate if you agree or disagree on the graph. Not on the example goals.

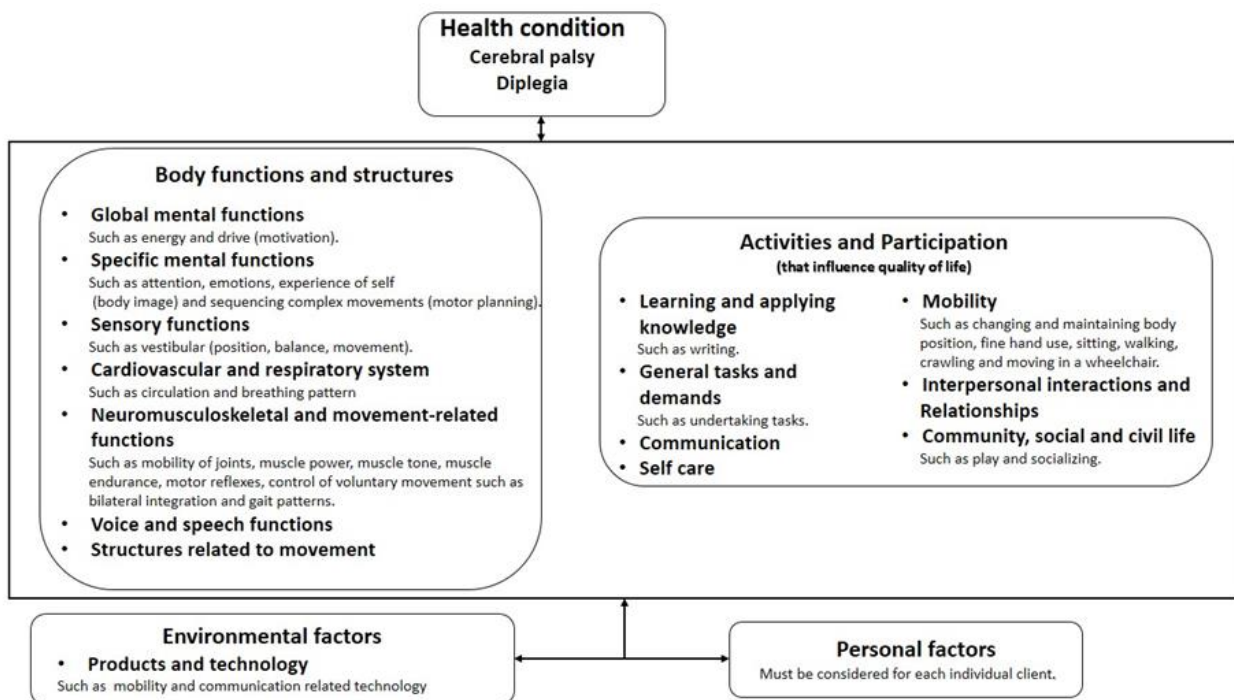
Example 1: Improve upper limb functions of the affected side within 15 hippotherapy sessions to enable the client to stabilise her book for 10 minutes with the affected hand while writing with the unaffected hand.

Example 2: Improve eye-hand coordination (a psychomotor function) within 20 hippotherapy sessions to enable the client to catch and throw a basketball 10 out of 20 times with both upper limbs during the school break when playing with his friends.

Example 3: Improve Pelvic weight shift in sitting within 10 hippotherapy sessions to enable the client to independently dress her lower body without falling over. This should be done by dressing the affected limb first.

7.3 To formulate treatment goals for clients with diplegia the following graph can be used.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines. Please list items in the graph that you shall change and give a reason.



The following goals is **examples** of how the graph can be used to formulate goals. You only indicate if you agree or disagree on the graph. Not on the example goals.

Example 1: Improve sitting endurance over 20 hippotherapy sessions on a walking horse, (10 minutes to 30 minutes) before the client needs repositioning (neuromusculoskeletal and movement related functions) in order for the client to take part in a 30 minute long wheelchair baseball match.

Example 2: Improve reactive balance (sensory function) over 12 sessions of hippotherapy, to reduce the number of times the client falls when walking around in her home for 5 to 1 time a day.

Example 3: Improve the client's confidence to enable her to attend a weekly social event with no assistance from her care giver by the end of 12 weeks of hippotherapy.

8. Activity characteristics

Guideline statements regarding hippotherapy activities.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines

8.1 Activities for clients on GMFCS levels I-III.

- a) Upper limb exercises (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.
- b) Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.
- c) Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.
- d) Eye hand coordination activities such as ball games.
- e) Three dimensional visual perceptual activities within games while on horseback.
- f) Two dimensional visual perceptual activities within games.
- g) Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.
- h) Use the horse as motivation to communicate for example the client must make a sound/sign before the horse walks.

- i) Use alternative and augmentative communication during hippotherapy sessions to allow the client to communicate with the team and the horse.
 - j) Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.
 - k) Sport related activities, such as hitting a target or throwing a ball into a basket.
 - l) Incorporating rhythm into games such as clapping and counting.
 - m) Only use the movement of the horse and no other activities are needed.
 - n) Fine motor activities such as drawing and writing.
 - o) Please indicate any proposed changes or other activities, if applicable.
- 8.2 Activities for clients on GMFCS levels IV-V.
- a) Only use the movement of the horse and no other activities are needed.
 - b) Upper limb exercises (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.
 - c) Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.
 - d) Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.
 - e) Use the horse as motivation to communicate for example the client have to make a sound/sign before the horse walks.
 - f) Use alternative and augmentative communication during hippotherapy sessions to allow the client to communicate with the team and the horse.
 - g) Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.
 - h) Sport related activities, such as hitting a target or throwing a ball into a basket.
 - i) Please indicate any proposed changes or other activities, if applicable.
- 8.3 Activities for clients with hemiplegia and diplegia on GMFCS levels IV-V.
- a) Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.
 - b) Eye hand coordination activities such as ball games.

- c) Three dimensional visual perceptual activities within games while on horseback.
- d) Two dimensional visual perceptual activities within games.
- e) Please indicate any proposed changes or other activities if applicable.

8.4 Activities only for clients with diplegia on GMFCS levels IV-V.

- a) Fine motor activities such as drawing and writing.
- b) Please indicate any proposed changes or other activities if applicable.

9. Horse breed

Guideline statements regarding horse breed

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 9.1 There is no preferred horse breed that is recommended for hippotherapy.
- 9.2 A cob (referring to a body type rather than a specific breed) is preferred for hippotherapy. Such a horse is small, usually of a stout build, with strong bones, large joints, and steady disposition.
- 9.3 Cross bred ponies are preferred for hippotherapy.
- 9.4 Part bred Welsh ponies are preferred for hippotherapy.
- 9.5 Ponies that are native to your country.
- 9.6 Native ponies that varies from around 12 to 14.2 hands (48 to 58 inches that is 122 to 147 cm).

10. Horse size

Guideline statements regarding the height of the horse

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

10.1 For clients on **GMFCS levels I, II or III**

- a) The back of the horse is in line or at the same height as the therapist's waist.
- b) The back of the horse is the same height as the therapist's chest.
- c) The back of the horse is anywhere between the therapist's middle and the therapist's chest.

10.2 For clients on **GMFCS levels IV or V**

- a) The back of the horse is in line or at the same height as the therapist's waist.

- b) The back of the horse is the same height as the therapist's chest.

Guideline statements regarding the horse width

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 10.3 Use a narrower horse for clients with tight adductors and less range of movement.
- 10.4 Use a broader pony that will provide a bigger base of support for clients with less dynamic sitting balance.
- 10.5 Take the client's physical size into consideration when deciding on the width of a horse.
- 10.6 Take the planned positional requirements (for the client), into consideration when deciding on the width of a horse.

11. Horse movement

Guideline statements regarding horse movement

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 11.1 For all clients with spastic CP:
- Use a horse with smooth but collected movement (a balanced horse).
 - A horse with a longer stride and smooth movements is used when the client presents with heightened tone.
 - A horse with choppy movements is used when the client presents with low tone.
- 11.2 For clients with **quadriplegia**:
- Start with a horse that provides little rotational movement to the client and grade upwards to work towards more rotation.
 - Horses are alternated (used different horses in different sessions) to address the client's multifactorial problems.
 - Used ground courses that enhance symmetry.
 - Use ground courses that enhance more asymmetrical movement in clients where one half of the body is more affected than the other.
- 11.3 For clients with hemiplegia:
- Use ground courses that provide symmetrical movements.
 - Use a horse with good pelvic rotation to facilitate normal/even lateral flexion in the client.



- c) Used ground courses that provide asymmetrical movement.
- d) Use a horse with smoother but collected movement.
- e) Use a faster gait.

11.4 For clients with **diplegia**:

- a) Start with a horse with shorter strides to target pelvic mobility, then progress onto a horse with longer stride lengths.
- b) Use a horse with long strides that provide anterior and posterior movement.
- c) Used more forward movement with more abrupt changes.

Guideline statements regarding of the horse's gaits

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

11.5 Introduce the gaits in the following order for clients on all **GMFCS levels**.

- a) Start at a slow walk and then introduce a medium to fast walk when the client is physical able to tolerate the movement.
- b) Start at a slow walk, progress to a medium walk and then to a fast walk.
- c) Start at a medium walk and progress to a fast walk.
- d) Only introduce a slow trot when core control can be maintained in a fast walk (this might happen quicker in clients with hemiplegia).
- e) When trotting is introduced start at a slow trot and progress to a medium trot.
- f) Slow trotting is introduced sooner for clients with diplegia than for clients with quadriplegia

Guideline statements regarding repetitive transitioning between gaits and gait-speed to facilitate responses in the client.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

11.6 For clients on **GMFCS levels I-III**.

- a) Only alter between different walking speeds but do not include halt.
- b) Transition from halt to walking to halt.
- c) Firstly, transition from halt – walk – halt and then grade upwards to altering between walking speeds (slow walking to medium walking to fast walking).

- d) First alter between walking speeds and then grade upwards to transitioning between halt – walk – halt.
 - e) Grade upwards to transition from halt – walk – trot, and backwards again.
- 11.7 **GMFCS levels IV-V in earlier** sessions (session 1-5).
- a) Don't use any transitions repetitively in therapy.
 - b) Use altering the walking speeds and then progress to transition from halt – walk – halt.
 - c) Transitions from halt – walk – halt.
 - d) Only use transitions between walking speeds, do not include halt – walk transitions.
- 11.8 For **GMFCS levels IV-V** add the following in **later** sessions (session 6 onward).
- a) Use altering walking speeds,
then transition from halt – walk – halt,
then halt – walk – trot and back trot – walk – halt.

Movement

Guideline statements regarding step length of the horse

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 11.9 Reduce the step length of the horse when the client's position on the horse is being compromised.
- 11.10 Before considering increased step length, the client should...:
- a) Have good head control.
 - b) Be able to accommodate the postural movements as presented at the current step length.
 - c) Have a good sitting balance.
- 11.11 Increased step length is advised:
- a) When the client's arousal level drop.
 - b) When greater postural challenge is needed.
 - c) From session three or four onwards.
 - d) During later therapy sessions (session six onwards).
 - e) When more pelvic movement is needed.
 - f) When core strength needs further improvement.

- g) When sensory regulation is needed.
- h) During later therapy sessions (session six onwards) in combination with different positions on the horse to challenge postural control, symmetry and balance.
- i) During later therapy sessions in combination with different ground courses to challenge the client's postural control, symmetry and balance i.e. increasing the step length on a figure of eight.
- j) During later therapy sessions in combination with directional changes.
- k) Increased step length in more supportive positions, i.e. forearm weight bearing at first.

Guideline statements regarding the client pelvic movement facilitation

- 11.12 Followed a neurodevelopmental frame of reference with regard to the progression of pelvic movements that is targeted in the client namely posterior-anterior, lateral and then rotation.
- 11.13 Address the limited pelvic movement of a walking client (identified through formal and ongoing assessment) by choosing a horse that provides more of that specific movement.
- 11.14 Provide anterior-posterior pelvic movements when treating a client with poor dissociation between the trunk and lower extremities.
- 11.15 Provide lateral pelvic movement before more pelvic rotation is introduced.
- 11.16 Start with the pelvic movement that the client already presents with (from a neurodevelopmental point of view). Then implement other treatment theories (such as vestibular stimulation and phylogenesis) to help the client reach more movement related function.

12. Dosage (duration of sessions, frequency of sessions, total amount of sessions and discharge criteria)

Guideline statements regarding the duration of hippotherapy sessions

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 12.1 Start by presenting shorter hippotherapy sessions and progress to longer sessions considering the physical endurance of each client.

- 12.2 For clients on GMFCS I-III start with sessions between 15 to 20 minutes
- 12.3 For clients on GMFCS I-III progress to sessions that are between 30-45 min long, later in therapy.
- 12.4 For clients on GMFCS IV-V start with 10-minute sessions during earlier sessions.
- 12.5 For clients on GMFCS IV-V III progress to sessions that are 30 min long during later therapy sessions.

Guideline statements regarding the frequency of hippotherapy sessions

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 12.6 Present sessions at least once a week for clients with CP on all GMFCS levels.
- 12.7 Sessions may be presented twice a week for all clients with spastic CP.
- 12.8 For clients with hemiplegia on GMFCS levels IV-V present sessions three times a week.

Guideline statements regarding intensive hippotherapy block sessions

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines

- 12.9 Provide at least 12 sessions during a block of intensive therapy.
- 12.10 Provide such intensive block therapy sessions at a frequency of least one session per week.
- 12.11 During intensive block sessions the frequency of hippotherapy sessions is at least twice a week.

Guideline statements regarding the amount of hippotherapy sessions before re-evaluation

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

Re-evaluation is done to determine if any discharge criteria apply or if new therapy goals need to be set.

- 12.12 Although re-evaluation is a continuous process, do a formal re-evaluation between session five and session 10.
- 12.13 Although re-evaluation is a continuous process, do a formal re-evaluation between session 10 and session 20.

Guideline statements regarding discharge criteria.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

- 12.14 It is recommended that clients are discharged when...
- a) ...they have reached their therapy goals set at onset of therapy.
 - b) ...the client is plateauing in terms of continued skill attainment.
 - c) ...the client is ready to integrate into riding for the disabled (RDA) sessions or mainstream riding lessons, with some therapy support.
 - d) ...hippotherapy is no longer safely indicated for a client i.e. changes in medical status, has developed contra indications or grown too big to be handled safely.
 - e) ...the client doesn't tolerate the sessions and therefor doesn't show improvement.
 - f) ...continuation of hippotherapy is too traumatic for everyone including the horse.

Structuring principles

13. Ground courses

Guideline statements regarding ground courses in which the horse is directed to walk or trot.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines

You will be asked to comment on all ground courses at the end of this section.

- 13.1 Hippotherapy start off with the horse walking in long straight lines.
- 13.2 Ground courses with a gradual bend, can be introduced when the client can sustain an upright posture on a horse walking in straight lines.
Gradual bends can include 20 m circle, three loop serpentines, large figures of 8 and gradual zigzag patterns.
- 13.3 Ground courses with shaper and smaller bends, can be introduced when the client can sustain an upright posture on the gradual bends.
Shaper and smaller bends can include 10 m circle, five loop serpentines, smaller figure of 8s and sharp zigzags.
- 13.4 Ground courses with a gradual bends can be introduced to clients with hemiplegia on GMFCS levels I-III earlier/sooner (session one to five) than to clients with quadriplegia or diplegia.



13.5 Greater variety in ground courses can be introduced during the later stages (session six and onwards) of hippotherapy.

13.6 Greater variety in ground courses is recommended for clients on GMFCS levels I-III than for clients on GMFCS levels IV-V.

14. Manner of leading

Guideline statements regarding leading of the hippotherapy horse

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

You will be asked to comment on manner of leading at the end of this section.

14.1 Use the following manner of leading

a) Side leading.



b) Long lining.



c) Long lining in combination with side leading.



d) Triangular leading.



14.2 Please comment on leading.

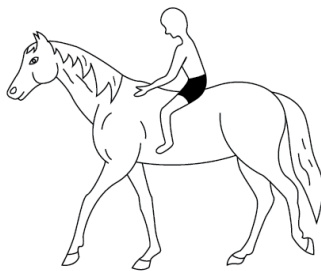
15. Positioning

Guideline statements regarding positioning of the client.

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

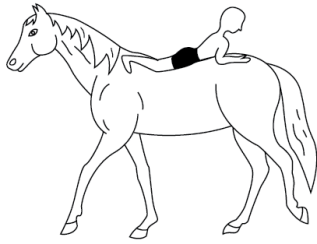
15.1 Use the following positions for all GMFCS levels throughout therapy as needed.

a) Forward sitting

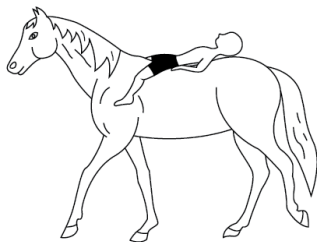




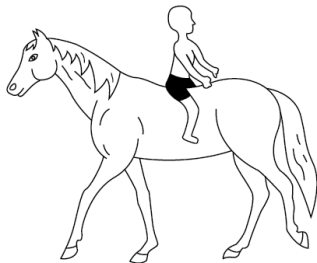
b) Backward prone



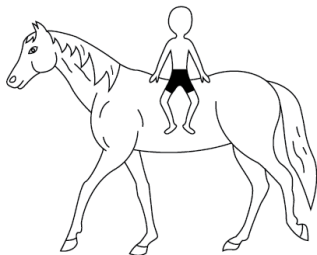
c) Backward supine



d) Backward sitting

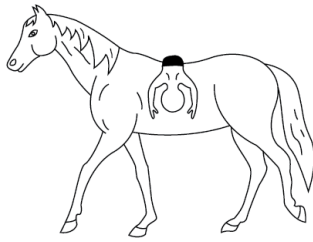


e) Side sitting

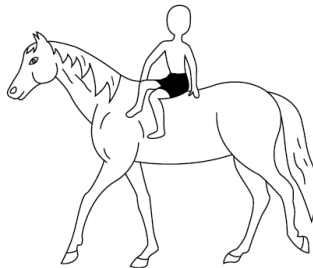




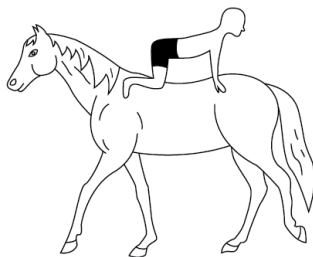
f) Prone lying "over the barrel"



g) Modified side sitting



h) All fours facing backward

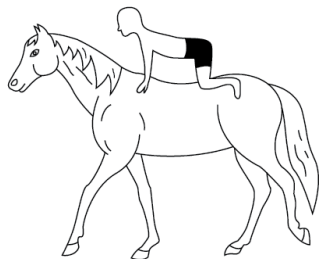


i) Other? Please specify.

15.2 "Modified side sitting" is not recommended for clients with hemiplegia GMFCS IV-V during earlier therapy sessions.

15.3 "All fours facing backwards" is not recommended for clients with diplegia GMFCS levels IV-V.

15.4 Introduce “all fours facing forward” during later sessions (session 6 and onward) for clients with hemiplegia on all levels.



15.5 Introduce “all fours facing forward” during later sessions (session 6 and onward) for clients with quadriplegia and diplegia on GMFCS levels I-III.

16. Horse tack and therapy equipment

Guideline statements regarding tack and equipment

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

16.1 Use a halter to lead the horse during the sessions.

16.2 Use a bridle to lead the horse during the sessions.

16.3 Use both halter and bridle simultaneously to lead the horse during the sessions.

16.4 For all clients with spastic CP

- a) Provide **little to no seating support** by using i.e. bare back pad or numnah.
- b) Provide **moderate seating support** by using i.e. general purpose saddle.
- c) Provide **additional seating support** by using i.e. a western saddle.
- d) Provide a **handle or strap to hold on** such as a vaulting surcingle or granny strap, still with little to no seating support.
- e) Provide stirrups.

16.5 For clients with **quadriplegia**, provide additional support such as rollers or pillows.

16.6 For clients with **hemiplegia**.

- a) Provide **no seating equipment** at all – bare back.
- b) Provide additional support through rollers or pillows for clients on **GMFCS levels IV-V**.

16.7 For clients with **diplegia**.

b) Provide **no equipment** at all – bare back.

c) Provide additional support such as rollers or pillows

16.8 Clients wear light weight safety helmets.

16.9 Clients wear riding boots when stirrups are used.

16.10 Clients wear any comfortable training shoes when stirrups are not used.

16.11 Clients wear normal clothing that are appropriate for the specific weather conditions.

16.12 Clients wear gait belts.

16.13 Clients wear any kind of splints should they need them.

17. Physical environment

Guideline statements regarding the hippotherapy facilities

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

17.1 Hippotherapy is conducted at the available facilities.

17.2 Hippotherapy facilities should include both indoor and outdoor facilities.

17.3 Do you have other suggestions or comments on hippotherapy facilities?

18. Temperature

Guideline statements regarding the temperature

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

18.1 The environmental temperature is taking into consideration when deciding if a hippotherapy session should proceed.

18.2 The therapist's subjective perception of the average temperature that is comfortable is dependent on the geographical area where therapy is conducted.

18.3 Sessions are cancelled when temperatures become uncomfortably hot or cold.



10.12 ANNEXURE K: EMAIL TO HIPPO THERAPY ASSOCIATIONS AND THERAPISTS

STUDY TITLE:

Development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy

Principal Investigator: Ninette du Plessis

Supervisor: Professor Kitty Uys

Co-supervisor: Tania Buys

Institution: University of Pretoria Faculty of Health Sciences, School of Health Care Sciences, Department of Occupational Therapy.

e-mail address: ninette@lightprojects.co.za

To whom it may concern

1) INTRODUCTION

My name is Ninette du Plessis and I am seeking occupational therapists, physiotherapists and speech and language pathologists using hippotherapy as treatment strategy to take part in research. I am doing this research for the purposes of a Doctor of Philosophy degree at the University of Pretoria (South Africa). The information in this document is provided to inform you on the details of the study and to ask you to pass the information on to any therapists affiliated with your association. Before you forward this information or provide us with contact details of therapists, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask me or my supervisors.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy (CP).

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

A demographic information form will firstly be send to all known therapists using hippotherapy as treatment strategy. This online demographic information form involves answering some questions regarding their history and experience as a therapist using hippotherapy as treatment strategy. It will take approximately 30 minutes and can be submitted online once finished. The researcher will keep the completed questionnaires in a safe place to make sure that only people working on the study will have access to it. Answers will be kept confidential (so nobody will know what was answered).

Secondly, should the therapist be willing and meet the inclusion criteria of the study, a second qualitative questionnaire will be send. This questionnaire will ask specific questions with regards to hippotherapy treatment of clients with spastic cerebral palsy (CP) and will take more or less 60 minutes to complete.

Thirdly, should the therapist be willing and meet further inclusion criteria and is selected, he/she will be asked to serve on an expert panel to comment on the guidelines that will be developed earlier in the study. This process will require three rounds of questionnaires at different times. More information on the process within the third phase will be provided to each expert in order for them to decide if they want to serve on the expert panel.

4) RISK AND DISCOMFORT INVOLVED

There is no foreseeable physical discomfort or risk involved. If there are questions that are too sensitive to answer, they need not be answered. Should a therapist serve on the expert panel the process will take up more time from the therapist.

5) POSSIBLE BENEFITS OF THIS STUDY

This study will help identify occupational therapists, physiotherapists and speech and language pathologists across the world that use hippotherapy as treatment strategy. As the study will lead to the development of transdisciplinary hippotherapy practice guidelines for clients with spastic CP, the guidelines will benefit clients with spastic CP, therapists

providing hippotherapy and researchers, and will promote future hippotherapy guideline development for other diagnostic groups.

6) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59. Telephone numbers +27 12 356 3084 / +27 12 356 3085 and written approval has been granted by that committee – ethics reference number: 774/2019. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving humans. A copy of the Declaration may be obtained from the investigator should you wish to review it.

7) INFORMATION

If you have any questions concerning this study, you may contact: Ninette du Plessis at ninette@lightprojects.co.za or Prof Kitty Uys at kitty.uys@up.ac.za or Tania Buys at tania.buys@up.ac.za.

8) CONFIDENTIALITY

All records from this study will be regarded as confidential. All results will be published or presented in such a way that it is not possible to identify the participants.

9) COMPENSATION

No one will be paid to take part in the study. There are no costs involved to be part of the study.

10) CONTACT INFORMATION OF THERAPISTS

Please provide contact details such as e-mail addresses of any therapists that use hippotherapy as treatment strategy known to you. This information will be kept confidential and only be used to send them an information letter and request to fill out the demographic information form. You may e-mail these names and e-mail addresses to me at ninette@lightprojects.co.za.



Therapist's name (Please print)	e-mail address

Thank you

Ninette du Plessis



10.13 ANNEXURE L: DEMOGRAPHIC INFORMATION FORM

This was created in Qualtrics.

1. Questions regarding to your profession and qualifications

Please select the answer that is applicable to you.

1.1. I am a

This was on a drop-down menu

- Occupational therapist
- Physiotherapist/ Physical therapist
- Speech and language pathologist
- Other?

Space was provided to answer the following questions.

1.2. In what country or countries did you study?

1.3. How many years of under-graduate studies are needed to obtain your degree?

1.4. In what year did you graduate?

1.5. Are you registered with the health professional council of your country?

- Yes
- No

This was a drop-down menu

1.6. Do you have post-graduate qualifications?

- Yes
- No

This was a drop-down menu

If yes

Please specify:.....

Did your post-graduate studies involve hippotherapy?

Please specify:.....



2. Questions regarding the country that you work and live in.

Space was provided to answer the following questions.

- 2.1. Please write the name of your home country?
- 2.2. Please tell us in what countries did you used hippotherapy as treatment strategy?

3. Questions regarding hippotherapy

- 3.1. Did you do a course in hippotherapy?

- Yes
- No

This was a drop-down menu

If yes,

Where did you do your course?

How long ago did you do your course?

What organisation presented the course?

- 3.2. Have you use hippotherapy as treatment strategy?

- Yes
- No

This was a drop-down menu

If yes

For how many years did you use hippotherapy as treatment strategy?

On average how many hours per year do you spend on treating clients through hippotherapy as treatment strategy?

Do you currently use hippotherapy as treatment strategy?

- Yes
- No

This was a drop-down menu

If no,

When last did you use hippotherapy as treatment strategy?

4. Questions regarding clients with cerebral palsy (CP)

- 4.1. Have you treated clients with CP?



- Yes
- No

This was a drop-down menu

If yes,

Please indicate for how many years have you treated clients with CP outside a hippotherapy setting?

Please indicate (on average) how many of your treatment hours (not in hippotherapy) was or is used in the treatment of clients with CP?

- less than one hour per week
- one to two hours per week
- three to four hours per week
- five to six hours per week
- seven to nine hours per week
- 10 to 20 hours per week
- More than 20 hours per week

This was a drop-down menu

4.2. Are you currently treating clients with CP through any treatment strategy?

- Yes
- No

This was a drop-down menu

If no,

When did you last treat a client with CP?

4.3. Do you use hippotherapy as treatment strategy for clients with CP?

- Yes
- No

This was a drop-down menu

If yes,

Space was provided to answer the following questions.

Please indicate for how many years have you treated clients with CP with hippotherapy as treatment strategy?

Please indicate (on average) how many of your treatment hours (in hippotherapy) was or is used in the treatment of clients with CP?

- less than one hour per week
- one to two hours per week
- three to four hours per week
- five to six hours per week
- seven to nine hours per week
- 10 to 20 hours per week
- more than 20 hours per week

This was a drop-down menu

5. Questions with regard further participation in this study

- 5.1. If you meet the inclusion criteria for the research, will you be willing to fill out a questionnaire on hippotherapy practice for clients with spastic-CP?
- Yes
 - No

This was a drop-down menu

- 5.2. Would you be willing to serve on a hippotherapy expert panel at a later stage of the study, should you be selected? If you are willing and meet the inclusion criteria, more information will be sent to you to help you make an informed decision on taking part or not.
- Yes
 - No

This was a drop-down menu

- 5.3. Please provide the contact information of any therapists known to you who use hippotherapy as treatment strategy, in order for us to also send this demographic information form to them.

10.14 ANNEXURE M: INFORMATION AND INFORMED CONSENT FOR DEMOGRAPHIC INFORMATION

**PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT
FOR A PARTICIPANT ADMINISTERED DEMOGRAFIC INFORMATION FORM**

STUDY TITLE:

Development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy

Principal Investigator: Ninette du Plessis

Supervisor: Professor Kitty Uys

Co-supervisor: Tania Buys

Institution: University of Pretoria Faculty of Health Sciences, School of Health Care Sciences, Department of Occupational Therapy.

e-mail address: ninette@lightprojects.co.za

Dear.....

In this document you will be given written information on my study. I shall also be available for discussions via Skype should you wish to speak to me or have any questions with regards to the research. Please request such a meeting via e-mail and tell me in what country you are living. This information will help me to take the different time zones into consideration when making your appointment.

Dear hippotherapy practitioner

1) INTRODUCTION

You are invited to volunteer for a research study. I am doing this research for the purposes of a Doctor of Philosophy degree at the University of Pretoria (South Africa). The information in this document is provided to help you to decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask me. You should not agree to take part unless you are completely happy with the kind of questions that will be asked.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy (CP).

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

This online demographic information form involves answering some questions regarding your history and experience as a therapist using hippotherapy as treatment strategy.

We would like you to complete an information form. It will take approximately 30 minutes. You can then submit the information form online once finished. We will not be available to help you with the questionnaire due to the different time zones and the amount of therapists taking part in the study. I shall keep the completed information forms in a safe place to make sure that only people working on the study will have access to it. Please do not write your name on the information form. This will ensure that your answers are kept confidential (so nobody will know what you have answered).

The information form consists of five main questions:

Questions 1: Questions regarding to your profession and qualifications.

Questions 2: Questions regarding to the country that you work and live in.

Questions 3: Questions regarding to hippotherapy

Questions 4: Questions regarding to clients with cerebral palsy

Questions 5: Questions regarding further participation in this study

4) RISK AND DISCOMFORT INVOLVED

There is no foreseeable physical discomfort or risk involved. If there are questions that are too sensitive for you to answer, you do not need to answer them.

5) POSSIBLE BENEFITS OF THIS STUDY

This part of the study will help to identify more occupational therapists, physiotherapists and speech and language pathologists across the world that use hippotherapy as treatment strategy. The other phases of the study will lead to the development of transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral. The guidelines will benefit clients with spastic CP, therapists providing hippotherapy and researchers, and will promote future hippotherapy guideline development for other diagnostic groups.

6) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59, Telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee (certificate number 774/2019). The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving humans. A copy of the Declaration may be obtained from the investigator should you wish to review it.

7) INFORMATION

If you have any questions concerning this study, you may contact: Ninette du Plessis at ninette@lightprojects.co.za or Prof Kitty Uys at kitty.uys@up.ac.za or Tania Buys at tania.buys@up.ac.za.



8) CONFIDENTIALITY

All records from this study will be regarded as confidential. All results will be published or presented in such a way that it is not possible to identify the participants.

9) COMPENSATION

You will not be paid to take part in the study. There are no costs involved for you to be part of the study.

INFORMED CONSENT DOCUMENT

This informed consent message was given in the Qualtrics survey.

I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study. I have also received, read and understood the above written information about the study. I have had adequate time to ask questions and I have no objections to participate in this study. I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results. I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status. I am participating willingly.

Yes I consent

No, I do not consent

Should the participant decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

10.15 ANNEXURE N: PILOT STUDY

Explanation of the pilot study document

The reader should take note of the following aspects regarding Annexure N:

- Any explanations given to the reader are typed in green.
- Hippotherapy questionnaire 1 and Hippotherapy questionnaire 2 will both be explained in Annexure N.
- The pilot participants completed all the questions in the questionnaires as well as an additional question intended only for the pilot study.
- To save space, the additional question for pilot participants can be seen below and will not be repeated after each question in this document.

Evaluation form

This evaluation form was given after every question within the qualitative questionnaire.

Questions	Did you understand the question?	Could the question be differently interpreted?	Suggestions for improvement
Question			

Information letter

The information letter was attached to the email with the link to the Qualtrics survey.

Dear Prospective Research Participant

Dear Mr / Ms / Mrs

1) INTRODUCTION

You are invited to volunteer for a research study by evaluating the qualitative questionnaire during the pilot phase of the study. I am doing this research for the purposes of a Doctor of Philosophy degree at the University of Pretoria (South Africa). The information in this

document is provided to help you to decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy with the kind of questions that will be asked.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop transdisciplinary hippotherapy practice guidelines for clients with spastic cerebral palsy (CP).

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

The online qualitative questionnaire involves answering questions regarding your experience as a therapist in using hippotherapy as treatment strategy for clients with spastic CP.

Thereafter you will be requested to evaluate the questions asked. This will also be done online.

It will take approximately 60 to 90 minutes. You will submit the questionnaire and evaluation online once finished. We will be available to help you with the qualitative questionnaire. The researcher will keep the completed questionnaires in a safe place to make sure that only people working on the study will have access to it. Please do not write your name on the questionnaire. This will ensure that your answers are kept confidential (so nobody will know what you have answered).

The qualitative questionnaire consists of questions regarding the hippotherapy treatment of clients with spastic quadriplegia, diplegia and hemiplegia on the Gross Motor Functional Classification System (GMFCS) levels I to III and GMFCS levels IV to V.

4) RISK AND DISCOMFORT INVOLVED

There is no foreseeable physical discomfort or risk involved other than the time spend to complete the questionnaire. If there are questions that are too sensitive for you to answer, you do not need to answer them.

5) POSSIBLE BENEFITS OF THIS STUDY

This part of the study will help to evaluate and improve the qualitative questionnaire. The other phases of the study will lead to the development of transdisciplinary hippotherapy practice guidelines for clients with spastic CP. The guidelines will benefit clients with spastic CP, therapists providing hippotherapy and researchers, and will promote future hippotherapy guideline development for other diagnostic groups.

6) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59, Telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee - certificate number (number to be inserted later). The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving humans. A copy of the Declaration may be obtained from the investigator should you wish to review it.

7) INFORMATION

If you have any questions concerning this study, you may contact: Ninette du Plessis at ninette@lightprojects.co.za or Prof Kitty Uys at kitty.uys@up.ac.za or Tania Buys at tania.buys@up.ac.za.

8) CONFIDENTIALITY

All records from this study will be regarded as confidential. All results will be published or presented in such a way that it is not possible to identify the participants.

9) COMPENSATION

You will not be paid to take part in the study. There are no costs involved for you to be part of the study.

Hippotherapy questionnaire 1

Dear hippotherapy practitioner

Please read the Participant Information letter that is attached to your e-mail.

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59. Telephone numbers +27 12 356 3084 / +27 12 356 3085 and written approval has been granted by that committee – ethics reference number: 774/2019

Informed consent

I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.

I have also received, read and understood the above written information about the study.

I have had adequate time to ask questions and I have no objections to participate in this study.

I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.

I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.

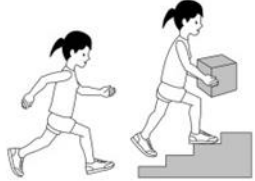

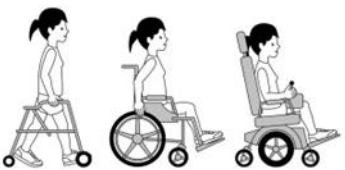

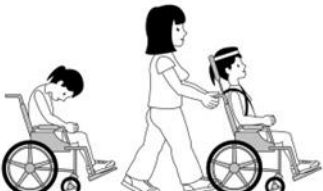
I am participating willingly.

- Yes I consent
- No, I do not consent

Should the participant decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

Throughout the questionnaire we shall group GMFCS levels I, II and III together in one group and levels IV and V together in another group.



	<p>GMFCS Level I</p> <p>Youth walk at home, school, outdoors and in the community. Youth are able to climb curbs and stairs without physical assistance or a railing. They perform gross motor skills such as running and jumping but speed, balance and coordination are limited.</p>
	<p>GMFCS Level II</p> <p>Youth walk in most settings but environmental factors and personal choice influence mobility choices. At school or work they may require a hand held mobility device for safety and climb stairs holding onto a railing. Outdoors and in the community youth may use wheeled mobility when traveling long distances.</p>
	<p>GMFCS Level III</p> <p>Youth are capable of walking using a hand-held mobility device. Youth may climb stairs holding onto a railing with supervision or assistance. At school they may self-propel a manual wheelchair or use powered mobility. Outdoors and in the community youth are transported in a wheelchair or use powered mobility.</p>
	<p>GMFCS Level IV</p> <p>Youth use wheeled mobility in most settings. Physical assistance of 1-2 people is required for transfers. Indoors, youth may walk short distances with physical assistance, use wheeled mobility or a body support walker when positioned. They may operate a powered chair, otherwise are transported in a manual wheelchair.</p>
	<p>GMFCS Level V</p> <p>Youth are transported in a manual wheelchair in all settings. Youth are limited in their ability to maintain antigravity head and trunk postures and control leg and arm movements. Self-mobility is severely limited, even with the use of assistive technology.</p>

GMFCS descriptors: Palisano et al. (1997) Dev Med Child Neurol 39:214-23
CanChild: www.canchild.ca

Illustrations copyright © Kerr Graham, Bill Reid and Adrienne Harvey,
The Royal Children's Hospital, Melbourne



Spastic Cerebral Palsy

Questions in section 1 are applicable to all spastic cerebral palsy diagnostic groups (quadriplegia, diplegia and hemiplegia).

A. THERAPEUTIC RELATIONSHIP Team

Question 1: Are you a

The possible answers were given in a drop-down menu

- Occupational therapist
- Physiotherapist
- Speech and Language Pathologist

Team

Question 2: What does your therapy team look like?

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1
Team of four:		
*Therapist (no hands on the client) only guiding the side walkers.	<input type="radio"/>	<input type="radio"/>
*Two side walkers	<input type="radio"/>	<input type="radio"/>
*Horse handler		
Team of three:		
*Therapist performing hands on therapy		
*One side walker	<input type="radio"/>	<input type="radio"/>
*Horse handler		
Team of three:		
*Therapist only guiding (no hands on)	<input type="radio"/>	<input type="radio"/>
*One side walker		



*Horse handler.

Team of two:

*Therapist besides client (hand on)

*Horse handler

Other? Please specify.

Pairing of a client with a horse

Question 3: Describe your professional reasoning (how do you decide) when pairing a therapy horse with a client on GMFCS levels I, II or III, with regards to temperament of the horse. _____

Pairing of a client with a horse

Question 4: Describe your professional reasoning (how do you decide) when pairing a therapy horse with a client on GMFCS levels IV and V with regards to temperament of the horse. _____

Pairing of a client with a horse

Question 5: With regards to the temperament of the horse, do your reasoning with regards to pairing the horse with a client differ between the spastic cerebral palsy groups (quadriplegia, hemiplegia, diplegia).

If yes please explain.

Yes _____

No



B. ACTIVITY REQUIREMENTS

Horses

Question 6: Is there a horse breed that you prefer for hippotherapy?

- Yes
- No
- If yes, please specify and indicate why

Horses

Question 7: What height do you prefer your therapy horse to be?

	GMFCS I, II, III	GMFCS IV, V
Back of the horse in line or at the same height as your hips.	<input type="radio"/>	<input type="radio"/>
Back of the horse in line or at the same height as your middle.	<input type="radio"/>	<input type="radio"/>
Back of the horse at the same height as your chest.	<input type="radio"/>	<input type="radio"/>
Other? Please specify		
<hr/>		

Horses

Question 8: What criteria do you use to decide on the desired width of the horse?



Horse

Question 9: Which of the following gaits and transitions will you use during early therapy sessions (sessions 1-5)?

Rank them in order of use, starting from number 1 (first used) and 2 (used second) and so on.

You do not have to use all of the options. Please give a 0 to the gaits that you never use in therapy.

	GMFCS I, II, III	GMFCS IV, V
Slow walk		
Medium walk		
Fast walk		
Alter between different walking speeds		
Slow trot		
Medium trot		
Alter the step length of the horse		
Transition from stand to walk to stand		
Transition from stand to walk to trot, to walk to stand		

Other? Please specify

The horse

Question 10: Which gaits and transitions will you use during later therapy sessions (from session 6 onward)?



Rank them in order of use, starting from number 1 (first used) and 2 (used second) and so on. *You do not have to use all of the options, please use a 0 for the gaits that you never use at this stage in therapy*

	GMFCS I, II, III	GMFCS IV, V
Slow walk		
Medium walk		
Fast walk		
Slow trot		
Medium trot		
Alter the step length of the horse		
Transition from stand to walk to stand		
Transition from stand to walk to trot, to walk to stand		
Other? Please specify		

Horse

Question 11: How will the horse's gaits that you use differ between clients with paraplegia, hemiplegia and quadriplegia?





Horse

Question 12: What type of leading do you prefer when treating these clients?

Rank in order of preference.



Number 1 (most preferable) and 4 (least preferable). Use number 0 for types of leading that you never use.

	GMFCS I, II, III					GMFCS IV, V				
	0	1	2	3	4	0	1	2	3	4
<p>Side leading</p> 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Long lining</p> 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Long lining combined with side leading for safety</p> 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Triangular leading</p> 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please specify

Does it differ between clients with quadriplegia, hemiplegia and diplegia? In what way?

C. PRESENTATION OF A SESSION

Question 13: What **frames of reference** or approaches do you use?

- Biomechanical Frame of Reference for Positioning Children for Functioning
- Dynamic systems theory
- Enhance Childhood occupations
- Enhance teaching-learning
- Enhance social participation
- Model of Human Occupation (Kielhofner)
- Motor skill acquisition
- Neuro Developmental Treatment (Bobath)
- Sensory integration (Ayres)
- Theory of neuronal group selection
- Vojta's rehabilitation (Vojta)
- Other (please specify) _____

The following elements within the question were presented in a random order



Precautions

Question 14: What precautions will you take into consideration?

You may choose as many as applicable to you

	GMFCS I, II, III	GMFCS IV, V
Do additional investigation, such as contacting the physician, before treating a client.	<input type="checkbox"/>	<input type="checkbox"/>
Add an extra side walker to the team to support the client.	<input type="checkbox"/>	<input type="checkbox"/>
Give the client extra verbal instructions on positions and functional activities while mounted.	<input type="checkbox"/>	<input type="checkbox"/>
Regular practicing of emergency dismounts within the team with a specific client in mind.	<input type="checkbox"/>	<input type="checkbox"/>
Regular team practice of mounting and dismounting, irrespective of the clients treated.	<input type="checkbox"/>	<input type="checkbox"/>
Only work indoors.	<input type="checkbox"/>	<input type="checkbox"/>
Use alternative mounting procedures.	<input type="checkbox"/>	<input type="checkbox"/>
Give hands-on postural support.	<input type="checkbox"/>	<input type="checkbox"/>
Seek alternative head protection (not standard riding hats) to accommodate poor head control.	<input type="checkbox"/>	<input type="checkbox"/>
Use of extra thick numnah.	<input type="checkbox"/>	<input type="checkbox"/>



Monitor heart rate throughout session.

Adapt positioning due to adductor tightness.

Other? Please specify



D. STRUCTURING REQUIREMENTS

Tack

Question 15: What kind of tack do you use for leading your horses?

You may tick as many options as applicable to your situation

Halter

Bridle

Both halter and bridle

Other (Please specify) _____

Physical environment

Question 16: Where do you mostly work?

You may tick as many options as applicable to your situation

	GMFCS I, II, III	GMFCS IV, V
Indoors	<input type="checkbox"/>	<input type="checkbox"/>
Outdoors	<input type="checkbox"/>	<input type="checkbox"/>
Both indoors and outdoors depending on the weather	<input type="checkbox"/>	<input type="checkbox"/>
Sand arena	<input type="checkbox"/>	<input type="checkbox"/>
Grass arena	<input type="checkbox"/>	<input type="checkbox"/>





Any arena with other flooring (please specify) (6)

Outside track

Other? Please specify _____

Dosage

Question 17 and 18

	GMFCS I, II, III	GMFCS IV, V
How many hippotherapy sessions do you include within your treatment plan before you re-evaluate?		
How many hippotherapy sessions do you on average have for each client before discharge?		



Clothing

Question 19: Select the kind of clothing your clients wear?

You may use only one or all of them

	GMFCS I,II, III	GMFCS IV, V
	Answer 1 (1)	Answer 1 (1)
Their normal clothes	<input type="checkbox"/>	<input type="checkbox"/>
Safety helmets	<input type="checkbox"/>	<input type="checkbox"/>
Gait belts	<input type="checkbox"/>	<input type="checkbox"/>
Riding boots	<input type="checkbox"/>	<input type="checkbox"/>
Other? (specify)	<input type="checkbox"/>	<input type="checkbox"/>

Discharge

Question 20: Name at least three discharge criteria that you use.



Quadriplegia

Please answer each of the following questions with clients with CP quadriplegia in mind.



Spastic quadriplegic cerebral palsy is characterised by at least two of the following symptoms affecting all four limbs (mostly the whole body).

- *Abnormal movement pattern of posture and/or movement*
- *Increased tone (not necessarily constant)*
- *Pathological reflexes*

A. ACTIVITY REQUIREMENTS

Horse

Question 1: What kind of movement of the horse do you prefer?

Rank them in order of use (grading), starting from number 1 (first used) and 2 (used second) and so on.

You do not have to use all of the options. Mark the options that you never use in therapy with a 0.



	GMFCS I, II, III						GMFCS IV, V					
	0	1	2	3	4	5	0	1	2	3	4	5
Anterior/ posterior movement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lateral movement (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rotational movement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertical movement (bounce)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other? Please specify

The client

Question 2: Give three long-term goals that you consider most important.

	GMFCS I, II, III	GMFCS IV, V

Goal 1		
Goal 2		
Goal 3		

The following elements within the question were presented in a random order.

Activities

Question 3: Rate the kind of activities that you use while the client on **GMFCS levels I, II or III** is on horseback?

How often do you use these activities?

	Always	Often	Sometimes	Rarely	Never
I only use the movement of the horse and no other activities are needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upper limb (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



rings or containers on poles or hooks or reaching to grasp objects.

Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.

Eye hand coordination activities such as ball games.

Three dimensional visual perceptual activities within games while on horseback.

Two dimensional visual perceptual activities within games.

Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.

Fine motor activities such as drawing and writing.

Use the horse as motivation to communicate for example the client has to make a sound/sign before the horse walks.

Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.

Sport related activities, such as hitting a target or throwing a ball into a basket.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other? Please specify

The following elements within the question were presented in a random order.

Activities

Question 4: Rate the kind of activities that you use while the client on **GMFCS levels IV or V** is on horseback?

How often do you use these activities?

	Always	Often	Sometimes	Rarely	Never
I only use the movement of the horse and no other activities are needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upper limb (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eye hand coordination activities such as ball games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Three dimensional visual perceptual activities within games while on horseback.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Two dimensional visual perceptual activities within games.

Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.

Fine motor activities such as drawing and writing.

Use the horse as motivation to communicate for example the client has to make a sound/sign before the horse walks.

Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.

Sport related activities, such as hitting a target or throwing a ball into a basket.

Other? Please specify

B. PRESENTATION OF A SESSION

Client support

Question 5: Where do you most often place your hands to support a client? Rank in order of frequency.

Number 1 (most) to 7 (least). If you never use that placement, tick number 0.

	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Some- times	Often	Always	Never	Rarely	Some- times	Often	Always
On shoulders										
On pelvis										
On thigh										
On knee										
On calve										
On ankle										
No hand on client										

Other? Please specify

C. STRUCTURING REQUIREMENTS

Dosage

Question 6: What is the average duration of each session (minutes on the horse) early on in therapy (sessions 1-5)?

Give consideration to the typical endurance at different GMFCS levels.



	GMFCS I, II, III	GMFCS IV, V
Time in minutes (1)	▼ 5 min (1 ... 60 min (12)	▼ 5 min (1 ... 60 min (12)

Dosage

Question 7: What is the average duration of each session (minutes on the horse) during later therapy sessions (session 6 and onward)?

Give consideration to the typical endurance at different GMFCS levels.

	GMFCS I, II, III	GMFCS IV, V
Time in minutes (1)	▼ 5 min (1 ... 60 min (12)	▼ 5 min (1 ... 60 min (12)

Dosage

Question 8: How frequently do you treat your clients?

	GMFCS I, II, III	GMFCS IV, V
Once a week	<input type="radio"/>	<input type="radio"/>
Twice a week	<input type="radio"/>	<input type="radio"/>
Other? (specify)	<input type="radio"/>	<input type="radio"/>



Ground courses

Question 9: Indicate the ground courses that the horse is directed to walk in the earlier therapy sessions (sessions 1-5). Rank them in order of use (grading), then number 2 (used second) and so on.

You do not have to use all of the options. If you never use a course, mark it with number 0

	GMFCS I, II, III	GMFCS IV, V
Long straight lines		
20 m circle		
10 m circle		
Large figure of 8, approximately 20 m diameter through each loop of the figure of 8		
Smaller figure of 8, approximately 10 m diameter through each loop of the figure of 8		
Three loop serpentine in a large dressage arena of 20X60 m		
Five loop serpentine in a large dressage arena of 20X60 m		
Sharp zig zag through bending poles		
Gradual zig zag through bending poles		

Other? Please specify



Ground courses

Question 10: Indicate the ground courses that the horse is directed to walk in during the later therapy sessions (session 6 onward). Rank them in order of use (grading), then number 2 (used second) and so on.

You do not have to use all of the options. If you never use a course, mark it with number 0.

	GMFCS I, II, III	GMFCS IV, V
Long straight lines.		
20 m circle.		
10 m circle.		
Large figure of 8, approximately 20 m diameter through each loop of the figure of 8.		
Smaller figure of 8, approximately 10 m diameter through each loop of the figure of 8.		
Three loop serpentine in a large dressage arena of 20X60 m.		
Five loop serpentine in a large dressage arena of 20X60 m (7)		
Sharp zig zag through bending poles.		
Gradual zig zag through bending poles.		

Other? Please specify.

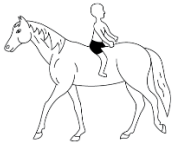


The following elements within the question were presented in a random order

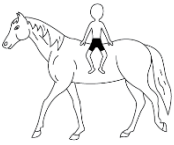
Positioning

Question 11: How often do you use the following positions during the earlier therapy sessions (sessions 1-5).

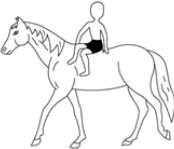
	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Sometimes	Often	Always	Never	Rarely	Sometimes	Often	Always
<p>Forwards sitting astride</p> 										
<p>Backward prone</p> 										
<p>Backwards supine</p> 										
<p>Backwards sitting</p>										



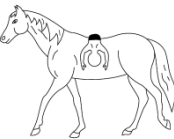
Side sitting



Modified side sitting

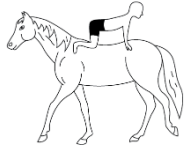


Prone lying "over the barrel"

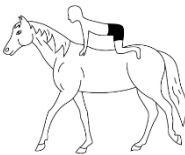




On all fours
backwards



On all fours forwards

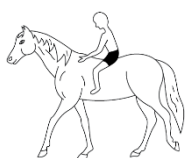


Other? Please specify

The following elements within the question were presented in a random order.

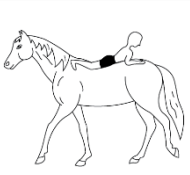
Positioning

Question 12: How often do you use the following positions during the later stages of therapy (from session 6 onward).

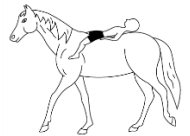
	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Sometimes	Often	Always	Never	Rarely	Sometimes	Often	Always
Forwards sitting astride 										



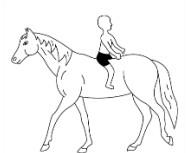
Backward prone



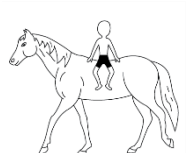
Backwards supine



Backwards sitting

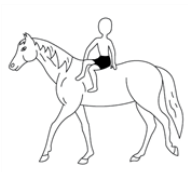


Side sitting

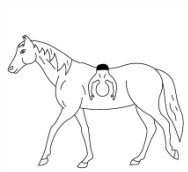




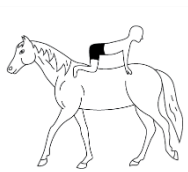
Modified side sitting



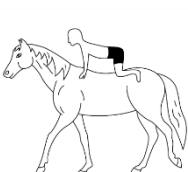
Prone lying "over the barrel"



On all fours backwards



On all fours forwards



Other? Please specify

Equipment



Question 13: Select the type equipment you use during the earlier stages of therapy (sessions 1 -5)?

You may use one or all of them

	GMFCS I, II, III	GMFCS IV, V
No equipment at all - bare back.	<input type="checkbox"/>	<input type="checkbox"/>
Little to no seating support such as a bare back pad or numnah.	<input type="checkbox"/>	<input type="checkbox"/>
A handle or strap to hold on such as a vaulting surcingle or granny strap. Still with little to no seating support.	<input type="checkbox"/>	<input type="checkbox"/>
More seating support such as general purpose saddle.	<input type="checkbox"/>	<input type="checkbox"/>
A lot of seating support such as a western saddle.	<input type="checkbox"/>	<input type="checkbox"/>
Additional support such as rollers or pillows.	<input type="checkbox"/>	<input type="checkbox"/>
Any kind of stirrups.	<input type="checkbox"/>	<input type="checkbox"/>

Other? Please specify



Equipment

Question 14: Select the type equipment you use during the later stages of therapy (session 6 onward)?

You may use one or all of them

	GMFCS I, II, III	GMFCS IV, V
No equipment at all - bare back	<input type="checkbox"/>	<input type="checkbox"/>
Little to no seating support such as a bare back pad or numnah	<input type="checkbox"/>	<input type="checkbox"/>
A handle or strap to hold on such as a vaulting surcingle or granny strap. Still with little to no seating support.	<input type="checkbox"/>	<input type="checkbox"/>
More seating support such as general purpose saddle.	<input type="checkbox"/>	<input type="checkbox"/>
A lot of seating support such as a western saddle.	<input type="checkbox"/>	<input type="checkbox"/>
Additional support such as rollers or pillows.	<input type="checkbox"/>	<input type="checkbox"/>
Any kind of stirrups.	<input type="checkbox"/>	<input type="checkbox"/>

Other? Please specify



Hippotherapy questionnaire 2

The same information and informed consent form than for “Hippotherapy questionnaire 1” was presented in “Hippotherapy questionnaire 2” for clients with hemiplegia and diplegia.

The following explanation was given before the questions on hemiplegia.

Hemiplegia

Please answer each of the following questions with clients with cerebral palsy hemiplegia in mind.



Spastic hemiplegic cerebral palsy is characterised by at least two of the following symptoms: Affecting the arm and leg on the same side (unilateral).

- *Abnormal movement pattern of posture and/or movement*
- *Increased tone (not necessarily constant).*
- *Pathological reflexes*

The same questions that were asked regarding CP clients with quadriplegia were repeated.

The following explanation was given before the questions on diplegia.

Diplegia



Please answer each of the following questions with clients with cerebral palsy diplegia in mind.

Spastic diplegic cerebral palsy is characterised by at least two of the following symptoms primarily affecting the legs (usually with some relatively limited involvement of arms)

- *Abnormal movement pattern of posture and/or movement.*
- *Increased tone (not necessarily constant).*
- *Pathological reflexes.*

The same questions that were asked regarding CP clients with quadriplegia were repeated.

10.16 ANNEXURE O: QUALITATIVE QUESTIONNAIRE ONE AND TWO

Hippotherapy questionnaire

Dear hippotherapy practitioner

Please read the Participant Information letter that is attached to your e-mail.

This protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Medical Campus, Tswelopele Building, Level 4-59. Telephone numbers +27 12 356 3084 / +27 12 356 3085 and written approval has been granted by that committee – ethics reference number: 774/2019

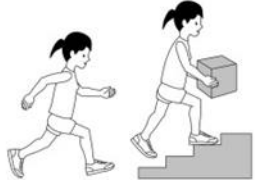

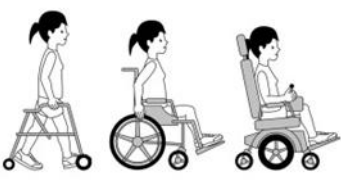


I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study. I have also received, read and understood the above written information about the study. I have had adequate time to ask questions and I have no objections to participate in this study. I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.

I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.

I am participating willingly.

- Yes, I consent
- No, I do not consent

Throughout the questionnaire we shall group GMFCS levels I, II and III together in one group and levels IV and V together in another group.

	<p>GMFCS Level I</p> <p>Youth walk at home, school, outdoors and in the community. Youth are able to climb curbs and stairs without physical assistance or a railing. They perform gross motor skills such as running and jumping but speed, balance and coordination are limited.</p>
	<p>GMFCS Level II</p> <p>Youth walk in most settings but environmental factors and personal choice influence mobility choices. At school or work they may require a hand held mobility device for safety and climb stairs holding onto a railing. Outdoors and in the community youth may use wheeled mobility when traveling long distances.</p>
	<p>GMFCS Level III</p> <p>Youth are capable of walking using a hand-held mobility device. Youth may climb stairs holding onto a railing with supervision or assistance. At school they may self-propel a manual wheelchair or use powered mobility. Outdoors and in the community youth are transported in a wheelchair or use powered mobility.</p>
	<p>GMFCS Level IV</p> <p>Youth use wheeled mobility in most settings. Physical assistance of 1-2 people is required for transfers. Indoors, youth may walk short distances with physical assistance, use wheeled mobility or a body support walker when positioned. They may operate a powered chair, otherwise are transported in a manual wheelchair.</p>
	<p>GMFCS Level V</p> <p>Youth are transported in a manual wheelchair in all settings. Youth are limited in their ability to maintain antigravity head and trunk postures and control leg and arm movements. Self-mobility is severely limited, even with the use of assistive technology.</p>
<p>GMFCS descriptors: Palisano et al. (1997) Dev Med Child Neurol 39:214-23 CanChild: www.canchild.ca</p>	<p>Illustrations copyright © Kerr Graham, Bill Reid and Adrienne Harvey, The Royal Children's Hospital, Melbourne</p>

Spastic Cerebral Palsy

Questions in section 1 are applicable to all spastic cerebral palsy diagnostic groups (quadriplegia, diplegia and hemiplegia).

B. THERAPEUTIC RELATIONSHIP

Team

Question 1: Are you a

The three options were given in a drop-down menu

- Occupational Therapist
- Physiotherapist
- Speech and Language Pathologist

Team

Question 2: What does your therapy team look like?

	GMFCS I, II, III	GMFCS IV, V
	Answer 1 (1)	Answer 1 (1)
Team of four:		
Therapist (no hands on the client) only guiding the side walkers	<input type="radio"/>	<input type="radio"/>
Two side walkers	<input type="radio"/>	<input type="radio"/>
Horse handler		
Team of three:		
Therapist performing hands on therapy		
One side walker	<input type="radio"/>	<input type="radio"/>
Horse handler		



Team of three:

Therapist only guiding (no hands on)

One side walker

Horse handler

Team of two:

Therapist besides client (hand on)

Horse handler

<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>

Other? Please specify.

Pairing of a client with a horse

Question 3: Describe your professional reasoning (how do you decide) when pairing a therapy horse with a client on GMFCS level I, II or III, regarding the temperament of the horse. _____

Pairing of a client with a horse

Question 4: Describe your professional reasoning (how do you decide) when pairing a therapy horse with a client on GMFCS level IV and V regarding the temperament of the horse. _____



Pairing of a client with a horse

Question 5: Regarding the temperament of the horse, do your reasoning with regard to pairing the horse with a client differ between the spastic cerebral palsy groups (quadriplegia, hemiplegia, diplegia)?

- Yes
- No

If yes, please explain.

B. ACTIVITY REQUIREMENTS

Horses

Question 6: Is there a horse breed that you prefer for hippotherapy?

- Yes
- No
- If yes, please specify and indicate why

Horses

Question 7: What height do you prefer your therapy horse to be?

	GMFCS I, II, III	GMFCS IV, V
<hr/>		



Back of the horse in line or at the same height as your hips.

Back of the horse in line or at the same height as your middle.

Back of the horse at the same height as your chest.

Other? Please specify

Horses

Question 8: What criteria do you use to decide on the desired width of the horse?

Horse

Question 9: Which of the following gaits and transitions will you use during early therapy sessions (sessions 1-5)?

Rank them in order of use, within each session by typing 1 (used first) and 2 (used second) and so on.

You do not have to use all the options. Please give a 0 to the gaits that you never use at this stage of therapy.

	GMFCS I, II, III	GMFCS IV, V
Slow walk	<input type="text"/>	<input type="text"/>
Medium walk	<input type="text"/>	<input type="text"/>



Fast walk	<input type="text"/>	<input type="text"/>
Alter between different walking speed without stopping	<input type="text"/>	<input type="text"/>
Slow trot	<input type="text"/>	<input type="text"/>
Medium trot	<input type="text"/>	<input type="text"/>
Transition from stand to walk to stand	<input type="text"/>	<input type="text"/>
Transition from stand to walk to trot, to walk to stand	<input type="text"/>	<input type="text"/>
Other? Please specify	<hr/>	

Horse

Question 10: Which of the following gaits and transitions will you use during later therapy sessions (sessions 6 onward)?

Rank them in order of use, within each session by typing 1 (used first) and 2 (used second) and so on.

You do not have to use all the options. Please give a 0 to the gaits that you never use at this stage of therapy.

	GMFCS I, II, III	GMFCS IV, V
Slow walk	<input type="text"/>	<input type="text"/>



Medium walk	<input type="text"/>	<input type="text"/>
Fast walk	<input type="text"/>	<input type="text"/>
Alter between different walking speeds without stopping	<input type="text"/>	<input type="text"/>
Slow trot	<input type="text"/>	<input type="text"/>
Medium trot	<input type="text"/>	<input type="text"/>
Transition from stand to walk to stand	<input type="text"/>	<input type="text"/>
Transition from stand to walk to trot, to walk to stand	<input type="text"/>	<input type="text"/>

Other? Please specify

Horse

Question 11a: When will you alter the step length of the horse during early therapy sessions (session 1-5)?

Question 11b: When will you alter the step length of the horse during later therapy sessions (session 6 onward)?

Horse

Questions 12: How will the horse's gaits that you use differ between clients with diplegia, hemiplegia and quadriplegia?



Horse




Question 13: What type of leading do you prefer when treating clients?

Rank in order of preference.

Number 1 (most preferable) and 4 (least preferable). Use number 0 for types of leading that you never use.

	GMFCS I, II, III					GMFCS IV, V				
	0	1	2	3	4	0	1	2	3	4
Side leading 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Long lining (2) 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Long lining combined with side leading for safety (3) 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Triangular leading (4) 		
---	---	---

Other? Please specify _____

Does it differ between clients with quadriplegia, hemiplegia and diplegia? In what way?

E. PRESENTATION OF A SESSION Frames of reference

Question 14: What **frames of reference** or approaches do you use?

- Cognitive Disability Frame of Reference (Claudia Allen)
- Biomechanical Frame of Reference for Positioning Children for Functioning
- Dynamic systems theory
- Ecology of Human Performance (EFP) (Winnie Dunn)
- Enhance Childhood occupations
- Enhance teaching-learning
- Enhance social participation



- Model of Human Occupation (Kielhofner)
- Motor skill acquisition
- Neuro Developmental Treatment (Bobath)
- Psycho-dynamic theory (Kielhofner)
- Sensory integration (Ayres)
- Theory of neuronal group selection
- Vojta's rehabilitation (Vojta)
- Other (please specify) _____

Precautions

Question 15: What precautions will you take into consideration?

You may choose as many as applicable to you

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1
Do additional investigation, such as contacting the physician, before treating a client.	<input type="checkbox"/>	<input type="checkbox"/>
Add an extra side walker to the team to support the client.	<input type="checkbox"/>	<input type="checkbox"/>



Give the client extra verbal instructions on positions and functional activities while mounted.	<input type="checkbox"/>	<input type="checkbox"/>
Regular practicing of emergency dismounts within the team with a specific client in mind.	<input type="checkbox"/>	<input type="checkbox"/>
Regular team practice of mounting and dismounting, irrespective of the clients treated.	<input type="checkbox"/>	<input type="checkbox"/>
Only work indoors.	<input type="checkbox"/>	<input type="checkbox"/>
Use alternative mounting procedures.	<input type="checkbox"/>	<input type="checkbox"/>
Give hands-on postural support.	<input type="checkbox"/>	<input type="checkbox"/>
Seek alternative head protection (not standard riding hats) to accommodate poor head control.	<input type="checkbox"/>	<input type="checkbox"/>
Use of extra thick numnah.	<input type="checkbox"/>	<input type="checkbox"/>
Monitor heart rate throughout session.	<input type="checkbox"/>	<input type="checkbox"/>
Adapt positioning due to adductor tightness.	<input type="checkbox"/>	<input type="checkbox"/>
Other? Please specify		

F. STRUCTURING REQUIREMENTS
Tack

Question 16. What kind of tack do you use for leading your horses?

You may tick as many options as applicable to your situation



- Halter
 - Bridle
 - Both halter and bridle simultaneously
 - Other (Please specify)
-

Physical environment

Question 17. Please select all the features that apply to the hippotherapy facilities you have access to.

You may tick as many options as applicable to your situation

- Indoors
 - Outdoors
 - Sand arena
 - Grass arena
 - Outside track
 - Any arena with other flooring (please specify)
-



Physical environment

Question 18: Where do you mostly work?

You may tick as many options as applicable to your situation

	GMFCS I, II, III	GMFCS IV, V
Indoors	<input type="checkbox"/>	<input type="checkbox"/>
Outdoors	<input type="checkbox"/>	<input type="checkbox"/>
Both indoors and outdoors depending on the weather	<input type="checkbox"/>	<input type="checkbox"/>
Sand arena	<input type="checkbox"/>	<input type="checkbox"/>
Grass arena	<input type="checkbox"/>	<input type="checkbox"/>
Outside track	<input type="checkbox"/>	<input type="checkbox"/>
Any arena with other flooring (please specify)	<input type="checkbox"/>	<input type="checkbox"/>

Other? Please specify



Physical environment

Question 19: Do you measure the temperature in the arena?

Yes

No

Please comment on temperature

Dosage

Question 20:

Questions regarding duration and frequency will be asked in a separate section.

	GMFCS I, II, III	GMFCS IV, V
How many hippotherapy sessions do you conduct before you re-evaluate?		
How many hippotherapy sessions do you on average have for each client before discharge?		
Do you ever use block sessions?		



If yes, how many hippotherapy sessions do you include in such a block?		
Please provide any other therapy practices regarding the number of sessions that you use.		

Clothing

Question 21: Select the kind of clothing your clients wear.

You may use only one or all of them

	GMFCS I, II, III	GMFCS IV, V
Their normal clothes	<input type="checkbox"/>	<input type="checkbox"/>
Safety helmets	<input type="checkbox"/>	<input type="checkbox"/>
Gait belts	<input type="checkbox"/>	<input type="checkbox"/>
Riding boots	<input type="checkbox"/>	<input type="checkbox"/>
Other? (specify)		



Discharge

Question 22: Name at least three discharge criteria that you use.

Quadriplegia

Please answer each of the following questions with clients with CP quadriplegia in mind.



Spastic quadriplegic cerebral palsy is characterised by at least two of the following symptoms affecting all four limbs (mostly the whole body).

- *Abnormal movement pattern of posture and/or movement*
- *Increased tone (not necessarily constant)*
- *Pathological reflexes*

D. ACTIVITY REQUIREMENTS

Horse

Question 1: What kind of movement of the horse do you prefer?

Rank them in order of use (grading), starting from number 1 (first used) and 2 (used second) and so on.

You do not have to use all the options. Mark the options that you never use in therapy with a 0.

In Qualtrics these two tables are clearly separated and participants can only click in the circle below the appropriate number.



	GMFCS I, II, III						GMFCS IV, V					
	0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)
Anterior/ posterior movement))))))))))))
Lateral movement))))))))))))
Rotational movement))))))))))))
Vertical movement (bounce)))))))))))))
Other? (specify)												

The client

Question 2: Give three long-term goals that you consider most important for clients with quadriplegia

	GMFCS I, II, III	GMFCS IV, V
Goal 1		
Goal 2		
Goal 3		

Activities



Question 3: Rate the kind of activities that you use while the client on **GMFCS level I, II or III** is on horseback?

How often do you use these activities?

	Always	Often	Sometimes	Rarely	Never
I only use the movement of the horse and no other activities are needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upper limb (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eye hand coordination activities such as ball games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Three dimensional visual perceptual activities within games while on horseback (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Two dimensional visual perceptual activities within games.

Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.

Fine motor activities such as drawing and writing.

Use the horse as motivation to communicate for example the client has to make a sound/sign before the horse walks.

Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.

Sport related activities, such as hitting a target or throwing a ball into a basket.

Other? Please specify

Activities

Question 4: Rate the kind of activities that you use while the client on **GMFCS levels IV or V** is on horseback?

How often do you use these activities?



	Always	Often	Sometimes	Rarely	Never
I only use the movement of the horse and no other activities are needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upper limb (only performing the movements) in the form of stretching, elevation, extension, diagonally and horizontal abduction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eye hand coordination activities such as ball games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Three dimensional visual perceptual activities within games while on horseback.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Two dimensional visual perceptual activities within games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fine motor activities such as putting/taking out pegs/clips in the	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



mane or putting stickers on the horse.

Fine motor activities such as drawing and writing.

Use the horse as motivation to communicate for example the client have to make a sound/sign before the horse walks.

Cognitive games such as memory or recognition games in which the child would identify; search for and find objects.

Sport related activities, such as hitting a target or throwing a ball into a basket.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other? Please specify

E. PRESENTATION OF A SESSION Client support

Question 5: Where do you most often place your hands to support a client?

	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Sometimes	Often	Always	Never	Rarely	Sometimes	Often	Always
On shoulders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



On pelvis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On thigh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On knee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On calve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On ankle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No hand on client	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other? Please specify



F. STRUCTURING REQUIREMENTS

Dosage

Question 6: What is the average duration of each session (minutes on the horse) early on in therapy (sessions 1-5)?

Give consideration to the typical endurance at different GMFCS levels.

The following elements were presented in a drop down menu.

	GMFCS I, II, III	GMFCS IV, V
	Answer 1 (1)	Answer 1 (1)
5 min (1)	<input type="radio"/>	<input type="radio"/>
10 min (2)	<input type="radio"/>	<input type="radio"/>
15 min (3)	<input type="radio"/>	<input type="radio"/>
20 min (4)	<input type="radio"/>	<input type="radio"/>
25 min (5)	<input type="radio"/>	<input type="radio"/>
30 min (6)	<input type="radio"/>	<input type="radio"/>
35 min (7)	<input type="radio"/>	<input type="radio"/>
40 min (8)	<input type="radio"/>	<input type="radio"/>
45 min (9)	<input type="radio"/>	<input type="radio"/>
50 min (10)	<input type="radio"/>	<input type="radio"/>



55 min (11)	<input type="radio"/>	<input type="radio"/>
60 min (12)	<input type="radio"/>	<input type="radio"/>
Other? (specify) (13)	<input type="radio"/>	<input type="radio"/>

Dosage

Question 7: What is the average duration of each session (minutes on the horse) during later therapy sessions (session 6 and onward)?

Give consideration to the typical endurance at different GMFCS levels.

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1
5 min (1)	<input type="radio"/>	<input type="radio"/>
10 min (2)	<input type="radio"/>	<input type="radio"/>
15 min (3)	<input type="radio"/>	<input type="radio"/>
20 min (4)	<input type="radio"/>	<input type="radio"/>
25 min (5)	<input type="radio"/>	<input type="radio"/>
30 min (6)	<input type="radio"/>	<input type="radio"/>
35 min (7)	<input type="radio"/>	<input type="radio"/>



40 min (8)	<input type="radio"/>	<input type="radio"/>
45 min (9)	<input type="radio"/>	<input type="radio"/>
50 min (10)	<input type="radio"/>	<input type="radio"/>
55 min (11)	<input type="radio"/>	<input type="radio"/>
60 min (12)	<input type="radio"/>	<input type="radio"/>
Other? (specify) (13)	<input type="radio"/>	<input type="radio"/>

Dosage

Question 8a: How frequently do you treat your clients through hippotherapy?

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1
Once a week	<input type="radio"/>	<input type="radio"/>
Twice a week	<input type="radio"/>	<input type="radio"/>
Other? (specify)	<input type="radio"/>	<input type="radio"/>

Question 8b: If you use block therapy, how frequently do you treat your clients during such a block? _____

Ground courses



Question 9: Indicate the ground courses that the horse is directed to walk in the earlier therapy sessions (sessions 1-5). Rank them in order of use (grading), starting from number 1 (used first) to number 9 (used last).

You do not have to use all the options. If you never use a course, mark it with number 0

	GMFCS I, II, III	GMFCS IV, V
Long straight lines	<input type="text"/>	<input type="text"/>
20 m circle	<input type="text"/>	<input type="text"/>
10 m circle	<input type="text"/>	<input type="text"/>
Large figure of 8, approximately 20 m diameter through each loop of the figure of 8	<input type="text"/>	<input type="text"/>
Smaller figure of 8, approximately 10 m diameter through each loop of the figure of 8	<input type="text"/>	<input type="text"/>
Three loop serpentine in a large dressage arena of 20X60 m	<input type="text"/>	<input type="text"/>
Five loop serpentine in a large dressage arena of 20 X 60 m	<input type="text"/>	<input type="text"/>
Sharp zig zag through bending poles	<input type="text"/>	<input type="text"/>
Gradual zig zag through bending poles	<input type="text"/>	<input type="text"/>

Other? Please specify



Ground courses

Question 10: Indicate the ground courses that the horse is directed to walk in during the later therapy sessions (session 6 onward). Rank them in order of use (grading), starting from number 1 (used first) to number 9 (used last).

You do not have to use all of the options. If you never use a course, mark it with number 0.

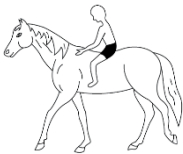
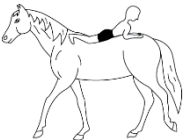
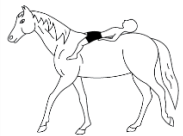
	GMFCS I, II, III	GMFCS IV, V
Long straight lines	<input type="text"/>	<input type="text"/>
20 m circle	<input type="text"/>	<input type="text"/>
10 m circle	<input type="text"/>	<input type="text"/>
Large figure of 8, approximately 20 m diameter through each loop of the figure of 8	<input type="text"/>	<input type="text"/>
Smaller figure of 8, approximately 10 m diameter through each loop of the figure of 8	<input type="text"/>	<input type="text"/>
Three loop serpentine in a large dressage arena of 20 X 60 m	<input type="text"/>	<input type="text"/>
Five loop serpentine in a large dressage arena of 20 X 60 m	<input type="text"/>	<input type="text"/>
Sharp zig zag through bending poles	<input type="text"/>	<input type="text"/>
Gradual zig zag through bending poles	<input type="text"/>	<input type="text"/>



Other? Please specify.

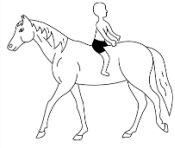
Positioning

Question 11: How often do you use the following positions during the earlier therapy sessions (sessions 1-5).

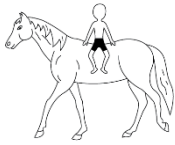
	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Some- times	Often	Always	Never	Rarely	Some- times	Often	Always
Forwards sitting astride 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backward prone 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backwards supine 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



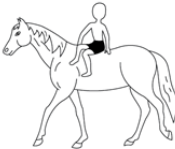
Backwards sitting



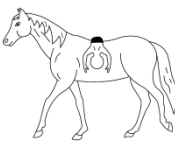
Side sitting



Modified side sitting

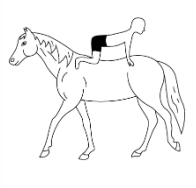


Prone lying "over the barrel"

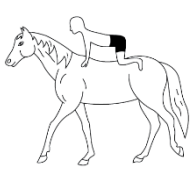




On all fours backwards



On all fours forwards

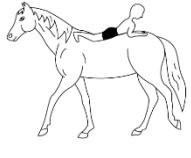


Other? Please specify



Positioning

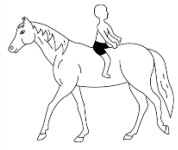
Question 12: What position or positions will you use during the later stages of therapy (from session 6 onward).

	GMFCS I, II, III					GMFCS IV, V				
	Never	Rarely	Some- times	Often	Alway s	Never	Rarely	Some- times	Often	Always
Forwards sitting astride										
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backward prone										
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backwards supine										
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

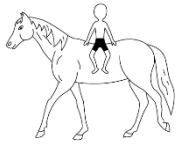




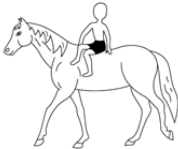
Backwards sitting



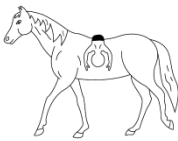
Side sitting



Modified side sitting

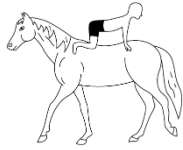


Prone lying "over the barrel"



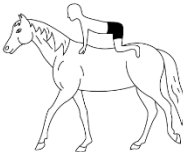


On all fours backwards



○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

On all fours forwards



○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Other? Please specify

Equipment

Question 13: Select the type equipment you use during the earlier stages of therapy (sessions 1 -5)?

You may use one or all of them

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1



No equipment at all	<input type="checkbox"/>	<input type="checkbox"/>
Little to no seating support on the horse's back such as numnah or bare back pad	<input type="checkbox"/>	<input type="checkbox"/>
A handle or strap to hold on such as a vaulting surcingle or granny strap. Still with little to no seating support.	<input type="checkbox"/>	<input type="checkbox"/>
More seating support such as general purpose saddle	<input type="checkbox"/>	<input type="checkbox"/>
A lot of seating support such as a western saddle	<input type="checkbox"/>	<input type="checkbox"/>
Additional support such as rollers or pillows	<input type="checkbox"/>	<input type="checkbox"/>
Any kind of stirrups	<input type="checkbox"/>	<input type="checkbox"/>
Other? Please specify		

Equipment

Question 14: Select the type equipment you use during the later stages of therapy (session 6 onward)?

You may use one or all of them

	GMFCS I, II, III	GMFCS IV, V
	Answer 1	Answer 1



No equipment at all - bare back

Little to no seating support such as numnah or bare back pad

A handle or strap to hold on such as a vaulting surcingle or granny strap. Still with little to no seating support.

More seating support such as general purpose saddle

A lot of seating support such as a western saddle

Additional support such as rollers or pillows

Any kind of stirrups

Other? Please specify

End of Block: Quadriplegia

Start of Block: Hemi

Hippotherapy questionnaire two

The questions given to the participants regarding quadriplegia were repeated in the second questionnaire regarding hemiplegia and diplegia. To save space the questions will not be repeated in the annexure.

10.17 ANNEXURE P: CONSENSUS ON EXCLUSION

First round

During the **first round** of the consensus process, consensus was reached by the expert panel on the **exclusion** of the following statements from the final guidelines. They are listed below.

Statements regarding repetitive transitioning between gaits and gait-speed

1. For clients on GMFCS level I-III, only alter between different walking speeds but do not include halt.

Statements regarding tack and equipment

For clients with **diplegia**.

2. Provide no equipment at all - bare back.

Statements regarding kind of leading

3. Use triangular leading



Second round

During the **second round** of the consensus process, consensus was reached on the exclusion of the following 12 statements from the final guidelines. They are listed below for your information.

Statements on physical handling

1. When gait belts are used, the therapist keeps contact with the belt even if no hands-on support or facilitation is needed.

Statements on activity characteristics

2. Only use the movement of the horse and no other activities for clients on GMFCS level I-III.
3. Only use the movement of the horse and no other activities for clients GMFCS level IV-V.
4. Use fine motor activities such as drawing and writing for clients with diplegia on GMFCS level IV-V.

Statements on horse movement

Horse's gaits

5. Introduce the gaits in the following order for clients on all GMFCS levels. Start at a medium walk and progress to a fast walk.

Repetitive transitioning between gaits

6. Don't use any transitions repetitively in therapy for clients on GMFCS level IV-V.
7. Other than the beginning and end of each session, only use transitions between walking speeds, for clients on GMFCS level IV-V in earlier sessions (session 1-5). Do not include halt to walk transitions.

Increased step length

8. Increased step length is advised from session three or four onwards.

Statements on dosage

Duration of sessions

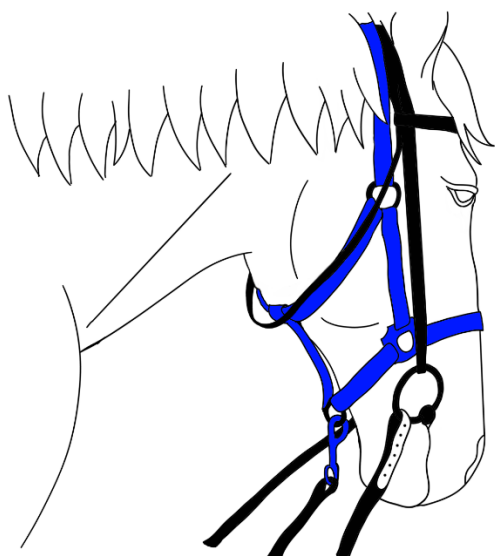
9. For clients on GMFCS IV-V progress to sessions that are 30 min long.

Frequency of hippotherapy sessions

10. For clients with hemiplegia on GMFCS level IV-V present sessions three times a week.

Tack and equipment

11. Use both a halter and a bridle simultaneously (halter underneath the bridle) to lead the horse from either one.



12. Provide no seating equipment at all - bare back for clients with hemiplegia.

10.18 ANNEXURE Q: SECOND DELPHI ROUND

Please bear in mind that the questions were presented in Qualtrics in a survey format.

Dear hippotherapy expert panel member

Thank you so much for your dedication and contribution to this study thus far. In the previous round you were presented with statements (possible guidelines) and had to decide if they should become part of the final hippotherapy practice guidelines.

During this round (second Delphi round) you will be presented with a few new statements that emerged from expert comments, and with the statements that we do not yet have consensus on.

Please note that **back riding** (where the therapist is riding with the client) and **ground work** (where the client is not mounted) are outside the scope of these guidelines.

The guidelines are only intended for clients with spastic cerebral palsy (CP) while **mounted** on a therapy horse.

Also note that guidelines on each hippotherapy concept are formulated separately, but should be considered and used simultaneously within therapy bearing the individual needs and goals of each client in mind as they progressed.

The same consensus statement that was given in Delphi round one was again presented to the expert panel members. Should the expert panel member have decided not to consent, the programme automatically took them to the last page where they were thanked and the session terminated.

New statements

The following question was presented in the Qualtrics programme after each new statement, but it is not repeated each time in this Annexure to save space.

- Agree
- Disagree
- Maybe

Should an expert panel choose “agree” or “disagree” the programme took them to the question:

Would you like to comment?.....

Should and expert panel member choose “maybe” the programme took them to the statement:

Please comment.....

New statements

These six new statements emerged from expert panel’s comments in the first Delphi round.

Please select agree, disagree or maybe on the inclusion of these statements into the final hippotherapy practice guidelines.

1. General

- 1.1. Hippotherapy is used by occupational therapists (OTs), physiotherapists (PTs) or speech and language pathologists (SLPs) in intervention.
- 1.2. OTs, PTs or SLPs should apply professional reasoning with the **individual** client in mind when considering any of these guidelines.
- 1.3. The movement of a horse is the tool used in hippotherapy.
- 1.4. Before any physical handling of a client, the therapist will explain the need for such physical handling to the client, parents and care givers and obtain their permission.

2. Horse

- 2.1. Ideally a variety of horses, regarding temperament, conformation, movement and weight bearing ability, which were trained for hippotherapy, are needed.

3. Physical environment

- 3.1. A mounting ramp is used to mount clients.

Statements that do not yet have consensus on

This part of the second round of this Delphi includes the statements that the expert panel did not yet reached agreement on. You will see two columns beside each statement.

Column one shows the group response, column two shows your own individual response.

You now have the opportunity to reconsider your response from round 1 in the context of the group response. Please note that you do not have to change your original response if you do not wish to.

Where applicable the statement will be adapted to incorporate the comments of the expert panel members, where after you must chose “agree or disagree” on the inclusion of this statement into the final hippotherapy practice guidelines.

The following question was presented in the Qualtrics programme after each guideline statement that did not reach consensus in the first Delphi round, but it is not repeated each time in this Annexure to save space.

Pease select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
 Disagree

4. Hippotherapy team

Bear in mind that we want to give advice on the **most appropriate** of composition of the therapy team for a client with spastic CP on a specific GMFCS level. This does **not** mean that this is the **only possible composition** of the therapy team.

Select “disagree” if a statement does not represent your expert opinion or should not be a guideline.

Select “agree if a statement represent one possible team composition that you think should be used.

4.1. Size and composition of the hippotherapy team

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
a. A team of three people conducts treatment of clients on GMFCS level IV and V . <ul style="list-style-type: none"> • Therapists on one side of the horse • One side walker on the other side of the horse • Horse handler that handles the horse. 	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: A Ex6: M Ex7: A Ex8: M Ex9: D Ex10: A Ex11: A

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

4.2. More variation in the composition of the team might be applicable for clients on GMFCS level I, II or III.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment



Statement from round one	Group response	Your response
a) A team of four people: <ul style="list-style-type: none">• The therapist giving guidance (not hands on)• Two side walkers walking on each side of the horse• A horse handler that handles the horse.	3 experts agreed 3 experts disagreed 4 experts said maybe	Ex1: D Ex2: A Ex3: M Ex4: D Ex5: A Ex6: M Ex7: M Ex8: A Ex9: D Ex10: A Ex11: M

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
b) A team of three people: <ul style="list-style-type: none">• The therapist on one side of the horse (performing hands on therapy),• A side walker on the other side of the horse.• A horse handler that handles the horse.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: A Ex3: M Ex4: M Ex5: A Ex6: M Ex7: M Ex8: A Ex9: D Ex10: A



		Ex11: A
--	--	---------

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
c) A team of three people: <ul style="list-style-type: none"> The therapist on one side of the client (performing no hands on therapy), A side walker on the other side of the client A horse handler that handles the horse. 	5 experts agreed 2 experts disagreed 4 experts said maybe	Ex1: D Ex2: A Ex3: M Ex4: M Ex5: A Ex6: M Ex7: A Ex8: A Ex9: D Ex10: A Ex11: M

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
d) A team of three <ul style="list-style-type: none"> A therapist A parent may perform the role of a side walker. A horse handler should handle the horse. 	4 experts agreed 2 experts disagreed 4 experts said maybe 1 expert only commented	Ex1: A Ex2: A Ex3: M Ex4: M Ex5: A Ex6: M Ex7: D Ex8: A

		Ex9: D Ex10: C Ex11: M
--	--	------------------------------

After taking the comments for the expert panel into consideration the statement will now read:

A team of three:

- A therapist
- A horse handler handles the horse.
- A parent may perform the role of a side walker. Provided that a parent is allowed to take part in a therapy session in that particular country, received adequate training, are physically able and that the client responds well to the parent being present.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
e) A team of two people: <ul style="list-style-type: none"> • The therapist performs hands on therapy • A horse handler that handles the horse. • There are no side walkers. 	3 experts agreed 2 experts disagreed 4 experts said maybe	Ex1: A Ex2: A Ex3: M Ex4: D Ex5: A Ex6: M Ex7: D Ex8: A Ex9: M Ex10: A

		Ex11: M
--	--	---------

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Please note that the following guideline wrongly read “a team of two” it is now corrected.

Statement from round one	Group response	Your response
f) A team of three <ul style="list-style-type: none"> two therapists walking on either side of the client A horse handler handles the horse. 	4 experts agreed 3 experts disagreed 3 experts said maybe 1 expert only commented	Ex1: A Ex2: A Ex3: M Ex4: C Ex5: A Ex6: D Ex7: D Ex8: M Ex9: D Ex10: A Ex11: M

After taking the comments for the expert panel into consideration the statement will now read:

Multidisciplinary therapy sessions (any combination of OT, PT and SLP) might be beneficial to a client, should it be possible.

This will then be a team of three:

- Two therapists walking on either side of the client
- A horse handler handles the horse.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

New statement on the therapy team

4.3. A therapy team may consists of three people

- One trained therapist (in hippotherapy)
- One therapist busy with hippotherapy training on the other side of the client as side walker
- A horse handler handles the horse.

Statements we do not yet have consensus on

5. Horse Temperament

Please bear in mind that agreeing with one temperamental trait does not exclude the other important traits.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
5.1. Use a hippotherapy horse that is attentive to clients on all the GMFCS levels.	5 experts agreed 3 experts disagreed 3 experts said maybe	Ex1: A Ex2: A Ex3: M Ex4: D Ex5: A Ex6: M Ex7: M Ex8: D Ex9: D Ex10: A Ex11: A

After taking the comments for the expert panel into consideration the statement will now read:

Use a hippotherapy horse that is aware of all clients, regardless their GMFCS levels, but only responds to the horse handler.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
<p>5.2. Use a hippotherapy horse that is attentive to the surroundings when treating clients on GMFCS levels I-III.</p>	<p>6 experts agreed</p> <p>4 experts disagreed</p> <p>1 expert said maybe</p>	<p>Ex1: A</p> <p>Ex2: A</p> <p>Ex3: A</p> <p>Ex4: D</p> <p>Ex5: A</p> <p>Ex6: D</p> <p>Ex7: D</p> <p>Ex8: D</p> <p>Ex9: A</p> <p>Ex10: A</p> <p>Ex11: M</p>

After taking the comments for the expert panel into consideration this possible guideline will now be:

Use a hippotherapy horse that is aware, but not distracted, by the surroundings when treating clients on all GMFCS levels.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

6. Physical handling

Physical handling of clients involves, **stabilising** the client and **facilitation** of movement.

Please bear in mind that this statement focus on the **hand placement and constant contact** should a gait belt (handling belt) be used. A separate statement on the use of **gait belts** will be presented to you under **tack and equipment**.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
<p>6.1. When gait belts are used, the therapist keeps contact with the belt even if no hands-on support or facilitation is needed.</p>	<p>3 experts agreed 5 experts disagreed 3 experts said maybe</p>	<p>Ex1: M Ex2: A Ex3: M Ex4: D Ex5: A Ex6: D Ex7: M Ex8: D Ex9: A Ex10: D Ex11: D</p>

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

7. Activity characteristics

Please bear in mind that activities should always have a specific **aim and purpose** to reach functional therapy goals.

These statements focus on possible activities while the client is **mounted**. Please keep the nature of hippotherapy in mind when considering these activities to be included or excluded from the practice guidelines.

New statement on activity characteristics

Please select agree, disagree or maybe on the inclusion of these guidelines into the final hippotherapy practice guidelines.

7.1. Although the movement of the horse (as an activity) as a starting point in hippotherapy, other activities can be considered for CP clients on all GMFCS levels.

Statements that did not yet reach consensus

7.2. Possible activities for clients on GMFCS level I-III.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
a) Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: M Ex2: M Ex3: A Ex4: M Ex5: D Ex6: M Ex7: A Ex8: A Ex9: A Ex10: A Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

GMFCS level I-III.

Statement from round one	Group response	Your response
b) Only use the movement of the horse and no other activities are needed.	3 experts agreed 4 experts disagreed	Ex1: M Ex2: A



	3 experts said maybe 1 expert only comment	Ex3: D Ex4: M Ex5: A Ex6: D Ex7: D Ex8: A Ex9: M Ex10: C Ex11: D
--	---	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

GMFCS level I-III.

Statement from round one	Group response	Your response
c) Fine motor activities such as drawing and writing.	5 experts agreed 3 experts disagreed 3 experts said maybe	Ex1: A Ex2: M Ex3: A Ex4: D Ex5: D Ex6: M Ex7: M Ex8: A Ex9: D Ex10: A Ex11: A

Keep the GMFCS level in mind when answering this question.

7.3. Possible activities for clients on GMFCS level IV-V.



Statement from round one	Group response	Your response
a) Only use the movement of the horse and no other activities are needed.	3 experts agreed 4 experts disagreed 3 experts said maybe 1 expert only commented	Ex1: A Ex2: M Ex3: D Ex4: D Ex5: A Ex6: D Ex7: M Ex8: M Ex9: A Ex10: C Ex11: D

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

GMFCS level IV-V.

Statement from round one	Group response	Your response
b) Games involving upper limb stretching, elevation extension, diagonally and horizontal abduction such as placing rings or containers on poles or hooks or reaching to grasp objects.	5 experts agreed 1 expert disagreed 4 experts said maybe 1 expert only commented	Ex1: M Ex2: M Ex3: A Ex4: A Ex5: D Ex6: A Ex7: M Ex8: A



		Ex9: A Ex10: C Ex11: M
--	--	------------------------------

Keep the GMFCS level in mind when answering this question

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

GMFCS level IV-V.

Statement from round one	Group response	Your response
c) Fine motor activities such as putting/taking out pegs/clips in the mane or putting stickers on the horse.	5 experts agreed 2 experts disagreed 3 experts said maybe 1 expert only commented	Ex1: D Ex2: M Ex3: A Ex4: M Ex5: D Ex6: A Ex7: A Ex8: A Ex9: A Ex10: C Ex11: M

Keep the GMFCS level in mind when answering this question

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

GMFCS level IV-V.

Statement from round one	Group response	Your response
d) Sport related activities, such as hitting a target or throwing a ball into a basket.	4 experts agreed 3 experts disagreed	Ex1: D Ex2: M



	3 experts said maybe 1 expert only commented	Ex3: A Ex4: D Ex5: D Ex6: M Ex7: A Ex8: A Ex9: A Ex10: C Ex11: M
--	---	--

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

7.4. Possible activities for clients with hemiplegia and diplegia on GMFCS level IV-V.

Statement from round one	Group response	Your response
a) Active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.	4 experts agreed 5 experts disagreed 1 expert said maybe 1 expert only commented	Ex1: A Ex2: M Ex3: A Ex4: D Ex5: D Ex6: A Ex7: D Ex8: A Ex9: D Ex10: C Ex11: D

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Hemiplegia and diplegia on GMFCS level IV-V.

Statement from round one	Group response	Your response
b) Three dimensional visual perceptual activities within games while on horseback.	4 experts agreed 3 experts disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: A Ex4: D Ex5: D Ex6: A Ex7: D Ex8: A Ex9: M Ex10: M Ex11: M

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Hemiplegia and diplegia on **GMFCS level IV-V.**

Statement from round one	Group response	Your response
c) Two dimensional visual perceptual activities within games.	4 experts agreed 2 experts disagreed 5 experts said maybe	Ex1: M Ex2: M Ex3: A Ex4: D Ex5: D



		Ex6: A Ex7: M Ex8: A Ex9: A Ex10: M Ex11: M
--	--	--

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

7.5. Possible activities only for clients with *diplegia* on GMFCS level IV-V.

Statement from round one	Group response	Your response
a) Fine motor activities such as drawing and writing.	2 experts agreed 6 experts disagreed 3 expert said maybe	Ex1: M Ex2: M Ex3: A Ex4: D Ex5: D Ex6: D Ex7: D Ex8: A Ex9: D Ex10: D Ex11: M

Keep the GMFCS level in mind when answering this question.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

8. Horse breed

Please bear in mind that there is already consensus on the inclusion of the following guideline.

There is no one preferred horse breed that is recommended for hippotherapy.

Now consider the inclusion or exclusion of the following statements.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
<p>8.1. A cob (referring to a body type rather than a specific breed) is preferred for hippotherapy. Such a horse is small, usually of a stout build, with strong bones, large joints, and steady disposition.</p>	<p>5 experts agreed</p> <p>3 experts disagreed</p> <p>3 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: D</p> <p>Ex3: M</p> <p>Ex4: M</p> <p>Ex5: A</p> <p>Ex6: M</p> <p>Ex7: A</p> <p>Ex8: A</p> <p>Ex9: A</p> <p>Ex10: D</p> <p>Ex11: D</p>

After taking the comments for the expert panel into consideration the statement will now read:

A cob (referring to a **body type** rather than a specific breed) is preferred for hippotherapy. Such a horse is short, usually of a stout build, with strong bones, large joints, and steady disposition.



Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
8.2. Cross-bred ponies are preferred.	3 experts agreed 4 experts disagreed 4 expert said maybe	Ex1: M Ex2: D Ex3: M Ex4: M Ex5: A Ex6: M Ex7: A Ex8: A Ex9: D Ex10: D Ex11: D

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
8.3. Part-bred Welsh ponies are preferred	4 experts agreed 4 experts disagreed 3 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: M Ex5: A Ex6: M Ex7: A Ex8: A Ex9: D



		Ex10: D Ex11: D
--	--	--------------------

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
8.4. Ponies that are native to your country.	4 experts agreed 4 experts disagreed 3 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: A Ex5: D Ex6: A Ex7: M Ex8: A Ex9: D Ex10: M Ex11: D

To accommodate comments, form the expert panel, bear the **ease of acquisition** of native ponies or horses in mind.

After taking the comments for the expert panel into consideration the statement will now read:

Provided that the pony or horse is suitable for therapy with regard to conformation, movement, temperament, weight bearing ability and training, ponies/horses that are native to your country are preferred for hippotherapy.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

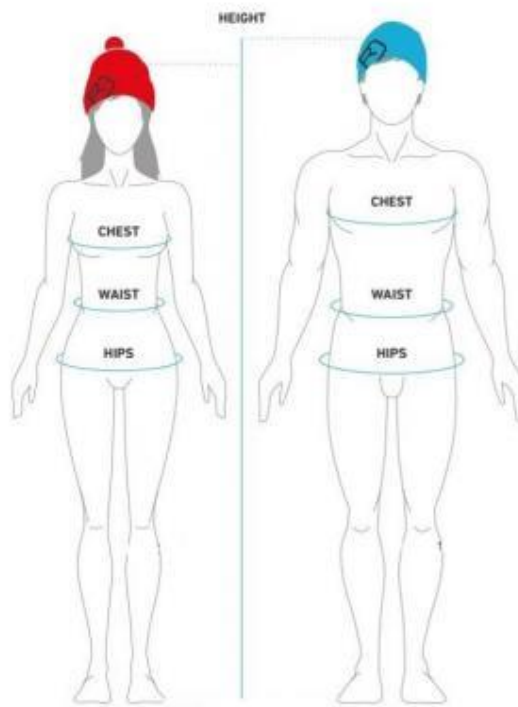
9. Horse size

Height of the horse

Please bear both the needs of the client and the safety (risk of injury) to the therapist in mind when considering the following statements.

To clarify the heights mentioned in the statements please see the figure below.

SIZE CHART



The pictures added to each statement are intended to help visualising the height of various horses.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

9.1. For clients on GMFCS level I, II or III

Statement from round one	Group response	Your response



<p>a. The back of the horse is in line or at the same height as the therapist's waist.</p>	<p>2 experts agreed 6 experts disagreed 3 experts said maybe</p>	<p>Ex1: A Ex2: D Ex3: M Ex4: M Ex5: D Ex6: D Ex7: D Ex8: D Ex9: A Ex10: D Ex11: M</p>
--	--	---



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients on **GMFCS level I, II or III**

Statement from round one	Group response	Your response
<p>b. The back of the horse is the same height as the therapist's chest.</p>	<p>2 experts agreed 3 experts disagreed 6 experts said maybe</p>	<p>Ex1: D Ex2: M Ex3: M Ex4: M</p>



		Ex5: D Ex6: M Ex7: M Ex8: A Ex9: A Ex10: D Ex11: M
--	--	--



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients on **GMFCS level I, II or III**

Statement from round one	Group response	Your response
c. The back of the horse is anywhere between the therapist's waist and the therapist's chest.	2 experts agreed 2 experts disagreed 7 expert said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: M Ex7: M Ex8: D Ex9: A Ex10: M



		Ex11: M
--	--	---------



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

9.2. For clients on GMFCS level IV or V

Statement from round one	Group response	Your response
a. The back of the horse is in line or at the same height as the therapist's waist.	2 experts agreed 4 experts disagreed 4 experts said maybe 1 expert marked both disagree and maybe	Ex1: A Ex2: D Ex3: M Ex4: M Ex5: D Ex6: M Ex7: D+M Ex8: D Ex9: A Ex10: D Ex11: M



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients on GMFCS level IV or V

Statement from round one	Group response	Your response
b. The back of the horse is the same height as the therapist's chest.	3 experts agreed 2 experts disagreed 6 experts said maybe	Ex1: D Ex2: M Ex3: M Ex4: M Ex5: D Ex6: A Ex7: M Ex8: A Ex9: A Ex10: M Ex11: M



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

New statement on horse height

- 9.3.** Select a horse such that their back is in line or at the same height as the therapist's shoulders when treating clients on **GMFCS levels I-III**



- 9.4.** Select a horse such that their back is in line or at the same height as the therapist's shoulders when treating clients on **GMFCS levels IV-V.**



Statements that did not yet reach consensus

Horse size

Width of the horse

Please note that statements on the width of the horse is but one aspect to consider and does not exclude other considerations such as positioning.

Please bear in mind that a client should not experience pain (or other harm) due to the width of a horse.

Statement from round one	Group response	Your response
<p>9.5. Use a broader pony that will provide a bigger base of support for clients with less dynamic sitting balance.</p>	<p>5 experts agreed</p> <p>0 experts disagreed</p> <p>6 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: M</p> <p>Ex3: A</p> <p>Ex4: M</p> <p>Ex5: A</p> <p>Ex6: M</p> <p>Ex7: M</p> <p>Ex8: A</p> <p>Ex9: M</p> <p>Ex10: M</p> <p>Ex11: A</p>

After taking the comments from the expert panel into consideration, the guideline will now read:

Use a broader pony that will provide a bigger base of support for clients with less dynamic sitting balance, but be cautious of the influence on the client's pelvis and hips.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

New statement on the width of a therapy horse

9.6. Use a broader pony when consider alternative positions that can benefit from a broader base.

10. Horse movement

Guidelines regarding horse movement

Bear in mind that although all horses move the pelvis of the client in all three dimensions, the therapist can choose a horse that emphasis movement in one plane.

Also bear in mind that one movement suggestion does not exclude other movement possibilities.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C= only gave a comment

10.1. For all clients with spastic CP

Statement from round one	Group response	Your response
a) A horse with a longer stride and smooth movements is used when the client presents with heightened tone.	5 experts agreed 0 experts disagreed 5 experts said maybe 1 expert only commented	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: A Ex6: C Ex7: A Ex8: M Ex9: M Ex10: M Ex11: A

Stride is defined as: **a single coordinated movement of all four legs**, thus one gait cycle.

Stride length is defined as: **the distance covered by the horse in one stride.**

After taking the comments of the expert panel into consideration the statement will now read:

A horse with a longer stride and smooth movements is used when the client presents with heightened tone, and is selected in relation to the age/size of the client.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For all clients with spastic CP

Statement from round one	Group response	Your response
b) A horse with choppier movements is used when the client presents with low tone.	5 experts agreed 0 experts disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: A Ex6: M Ex7: A Ex8: A Ex9: M Ex10: M Ex11: A

After taking the comments from the expert panel into consideration the guideline will now read:

A horse that gives more concussion and vertical displacement is used when the client presents with low tone, should the client have enough head control.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C= only gave a comment

10.2. For clients with quadriplegia:

Statement from round one	Group response	Your response
a) Start with a horse that provides little rotational movement to the client and grade upwards to work towards more rotation.	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: M Ex6: M Ex7: A Ex8: A Ex9: A Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines

For clients with quadriplegia:

Statement from round one	Group response	Your response
b) Horses are alternated (used different horses in different sessions) to address the client's multifactorial problems.	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: A Ex6: M Ex7: D Ex8: M





		Ex9: A Ex10: A Ex11: M
--	--	------------------------------

After taking the comments from the expert panel into consideration the guideline will now read:

Used different horses in different sessions (if and when needed) to address the client's multifactorial problems and changing needs.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with quadriplegia:

Statement from round one	Group response	Your response
c) Use ground courses that enhance symmetry	6 experts agreed 1 expert disagreed 3 experts said maybe 1 expert only commented	Ex1: A Ex2: M Ex3: A Ex4: A Ex5: A Ex6: A Ex7: M Ex8: A Ex9: D Ex10: C Ex11: M

Ground courses are defined as any pre-determined figure-route that the horse can walk or trot in, and include school figures/movements, zig-zags, figure of eights, inclines and declines etc.

After taking the comments from the expert panel into consideration the guideline will now read:

Use ground courses that enhance symmetry in the client.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with quadriplegia:

Statement from round one	Group response	Your response
d) Use ground courses that enhance more asymmetrical movement in clients where one half of the body is more affected than the other.	2 experts agreed 4 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: M Ex6: D Ex7: M Ex8: A Ex9: D Ex10: D Ex11: M

Ground courses are defined as any pre-determined figure-route that the horse can walk or trot in and include school figures/movements, zig-zags, figure of eights, inclines and declines.

After taking the comments from the expert panel into consideration the guideline will now read:

Where one half of the body is more affected than the other, use ground courses that require asymmetrical **responses** in a client (such as bends and circles) to ultimately promote symmetry in the client.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

10.3. For clients with hemiplegia

Statement from round one	Group response	Your response
a) Use ground courses that provide symmetrical movements.	5 experts agreed 1 expert disagreed 4 experts said maybe 1 expert only commented	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: A Ex6: A Ex7: M Ex8: M Ex9: D Ex10: C Ex11: A

Ground courses are defined as any pre-determined figure-route that the horse can walk or trot in and include school figures/movements, zig-zags, figure of eights, inclines and declines etc.

After taking the comments from the expert panel into consideration the statement will now read:

For **hemiplegic** clients, use ground courses that require symmetrical responses in a client (such as straight lines) to ultimately promote symmetry in the client.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with hemiplegia

Statement from round one	Group response	Your response
b) Used ground courses that provide asymmetrical movement.	1 expert agreed 6 experts disagreed 4 experts said maybe	Ex1: D Ex2: D Ex3: M Ex4: M Ex5: M Ex6: D Ex7: D Ex8: A Ex9: D Ex10: D Ex11: M

Ground courses are defined as any pre-determined figure-route that the horse can walk or trot in and include school figures/movements, zig-zags, figure of eights, inclines and declines.

After taking the comments from the expert panel into consideration the statement will now read:

For **hemiplegic** clients, use ground courses that require asymmetrical responses in a client (such as bends and circles) to ultimately promote symmetry in the client.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with hemiplegia

Statement from round one	Group response	Your response
c) Use a horse with good pelvic rotation to facilitate normal/even lateral flexion in the client	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: A Ex6: D Ex7: A Ex8: M Ex9: A Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with hemiplegia

Statement from round one	Group response	Your response
d) Use a faster gait.	3 experts agreed 1 expert disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: M



		Ex6: M Ex7: M Ex8: A Ex9: A Ex10: D Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

10.4. For clients with diplegia

Statement from round one	Group response	Your response
a) Start with a horse with shorter strides to target pelvic mobility, then progress onto a horse with longer stride lengths.	5 experts agreed 2 experts disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: A Ex6: M Ex7: A Ex8: A Ex9: A Ex10: D Ex11: M

Stride is defined as: **a single coordinated movement of all four legs**, thus one gait cycle.

Stride length is defined as: **the distance covered by the horse in one stride.**

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with **diplegia**



Statement from round one	Group response	Your response
b) Use a horse with long strides that provide anterior and posterior movement.	4 experts agreed 0 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: A Ex7: M Ex8: M Ex9: A Ex10: M Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients with **diplegia**

Statement from round one	Group response	Your response
c) Used more forward movement with more abrupt changes.	1 expert agreed 3 experts disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: M Ex7: D Ex8: A Ex9: M

		Ex10: D Ex11: M
--	--	--------------------

After taking the comments from the expert panel into consideration the statement will now read:

Use more forward movement with more abrupt changes When the client is ready for more advance input.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Horse's gaits

Order of gait introduction

There are already have consensus on the inclusion of the following guideline.

Start at a slow walk and then introduce a medium to fast walk when the client is physical able to tolerate the movement.

With this in mind please consider the inclusion or exclusion of the the following statements into the final hippotherapy practice guidelines.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

10.5. Introduce the gaits in the following order for clients on all GMFCS levels.

Statement from round one	Group response	Your response
a) Start at a medium walk and progress to a fast walk.	1 expert agreed 5 experts disagreed 5 experts said maybe	Ex1: D Ex2: M Ex3: M Ex4: M Ex5: M Ex6: M Ex7: D

		Ex8: D Ex9: A Ex10: D Ex11: D
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Introduce the gaits in the following order for clients on all GMFCS levels.

Statement from round one	Group response	Your response
b) Only introduce a slow trot when core control can be maintained in a fast walk (this might happen quicker in clients with hemiplegia).	5 experts agreed 0 experts disagreed 5 experts said maybe 1 expert did not answer	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: A Ex7: A Ex8: M Ex9: A Ex10: M Ex11: -

After taking the comments for the expert panel into consideration a statement is added to this possible guideline and the guideline will now read:

Introduce a slow trot (for a few strides) when core control and head control can be maintained in a fast walk.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Introduce the gaits in the following order for clients on all GMFCS levels.



Statement from round one	Group response	Your response
c) When trotting is introduced start at a slow trot and progress to a medium trot.	4 experts agreed 3 experts disagreed 4 experts said maybe	Ex1: A Ex2: D Ex3: A Ex4: D Ex5: M Ex6: M Ex7: M Ex8: M Ex9: A Ex10: D Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Introduce the gaits in the following order for clients on all GMFCS levels.

Statement from round one	Group response	Your response
d) Slow trotting is introduced sooner for clients with diplegia than for clients with quadriplegia.	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: A Ex7: M



		Ex8: A Ex9: A Ex10: D Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Guidelines regarding repetitive transitioning between gaits and gait-speed to facilitate responses in the client.

There is already consensus on the inclusion of the following statement into the guidelines.

For clients on GMFCS level I-III use transitions from halt to walk to halt.

With this in mind please consider inclusion/exclusion of the following statements into the **final** hippotherapy practice guidelines.

10.6. For clients on GMFCS level I-III.

Statement from round one	Group response	Your response
a) Firstly, transition from halt, to walk, to halt and then grade upwards to altering between walking speeds (slow walking to medium walking to fast walking).	4 experts agreed 4 experts disagreed 3 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: D Ex7: A Ex8: D Ex9: A Ex10: D Ex11: D

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients on GMFCS level I-III.

Statement from round one	Group response	Your response
b) Firstly, alter between walking speeds and then grade upwards to transitioning from halt to walk to halt.	6 experts agreed 2 experts disagreed 3 experts said maybe	Ex1: D Ex2: M Ex3: M Ex4: D Ex5: A Ex6: A Ex7: A Ex8: A Ex9: A Ex10: A Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

For clients on GMFCS level I-III.

Statement from round one	Group response	Your response
c) Grade upwards to transition from a halt to a walk to a trot (few strides) and backwards again.	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: A Ex3: M Ex4: M Ex5: M Ex6: A Ex7: A Ex8: M





		Ex9: A Ex10: M Ex11: D
--	--	------------------------------

After taking the comments from the expert panel into consideration the statement will now read:

Grade upwards to transition from a halt to a walk to a trot (few strides) and backwards again.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines

Horse movement

Repetitive transitioning between gaits and gait-speed to facilitate responses in the client

Please bear in mind that the number of sessions is only a guideline and must not be seen a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

10.7. GMFCS level IV-V in earlier sessions (session 1-5).

Statement from round one	Group response	Your response
a) Don't use any transitions repetitively in therapy.	2 experts agreed 4 experts disagreed 4 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: M Ex5: A Ex6: M Ex7: M Ex8: D Ex9: M Ex10: D



		Ex11: D
--	--	---------

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

GMFCS level IV-V in earlier sessions (session 1-5).

Statement from round one	Group response	Your response
b) Use: <ul style="list-style-type: none"> Altering walking speeds Progress to transition from halt - walk - halt. 	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: M Ex7: A Ex8: A Ex9: A Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

GMFCS level IV-V in earlier sessions (session 1-5).

Statement from round one	Group response	Your response
c) Transitions from halt- walk - halt.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: D Ex6: M



		Ex7: A Ex8: A Ex9: A Ex10: A Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

GMFCS level IV-V in earlier sessions (session 1-5).

Statement from round one	Group response	Your response
d) Only use transitions between walking speeds, do not include halt to walk transitions	4 experts agreed 5 experts disagreed 2 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: D Ex5: A Ex6: A Ex7: D Ex8: D Ex9: A Ex10: D Ex11: M

After taking the comments for the expert panel into consideration the statement will now read:

Other than the beginning and end of each session, only use transitions between walking speeds, do not include halt to walk transitions.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Please bear in mind that the number of sessions is only a guideline and must not be seen a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

10.8. For GMFCS level IV-V add the following in later sessions (session 6 onward).

Possible guideline	Group response	Your response
a) Use altering walking speeds, then transition from halt – walk – halt, then halt - walk - trot and back trot – walk- halt.	2 experts agreed 2 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: M Ex7: M Ex8: M Ex9: A Ex10: D Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

New possible guidelines regarding to the walking speed of the horse

In walk, the step of each hoof (step length) is equally long, symmetrical and ground-covering. When increasing a horse's walking speed, the step length often (but not necessarily) also increase.

Before answering the following possible guidelines regarding the step length of a hippotherapy horse, please keep in mind that it might be difficult (but not impossible) for both

the horse and the horse handler to alter step length in hand while keeping the speed constant.

10.9. When a different step length is needed for a client, consider using a different horse.

10.10. Consider a change in walking speed (easier to accomplish in hand) rather than step length change within a session.

Statements regarding step length of the horse that we do not have consensus on

Statement from round one	Group response	Your response
10.11. Reduce the step length of the horse when the client's position on the horse is being compromised.	3 experts agreed 3 experts disagreed 5 experts said maybe	Ex1: D Ex2: M Ex3: A Ex4: D Ex5: M Ex6: M Ex7: M Ex8: A Ex9: M Ex10: A Ex11: D

After taking the comments from the expert panel into consideration, the guideline will now read:

Reduce the step length of the horse when clients are unable to maintain their personal optimum posture to accommodate for the motor challenges presented by the horse,

provided that fatigue, pain and discomfort are ruled out as reason for the compromised posture.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
10.12. Before considering increased step length, the client should have a good sitting balance.	5 experts agreed 3 experts disagreed 2 experts said maybe 1 expert only commented	Ex1: A Ex2: C Ex3: A Ex4: A Ex5: D Ex6: A Ex7: M Ex8: M Ex9: A Ex10: D Ex11: D

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

10.13. Increased step length is advised:

Statement from round one	Group response	Your response
a) When the client's arousal level drops.	6 experts agreed 0 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M



		Ex5: A Ex6: M Ex7: A Ex8: A Ex9: A Ex10: M Ex11: A
--	--	--

Please note that this statement does not exclude other possible solutions for a drop in arousal level.

After taking the comments for the expert panel into consideration a statement is added to this possible guideline and the guideline will now read:

Increased step length is advised when the client's arousal level drops, provided that fatigue is ruled out as a reason.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
b) From session three or four onwards.	1 expert agreed 5 experts disagreed 5 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: D Ex5: D Ex6: M Ex7: M Ex8: D Ex9: M Ex10: D



		Ex11: M
--	--	---------

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
c) During later therapy sessions (session six onwards).	2 experts agreed 4 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: D Ex6: M Ex7: M Ex8: D Ex9: A Ex10: D Ex11: M

Please bear in mind that the number of sessions is only a guideline and must not be seen a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
d) When sensory regulation is needed	5 experts agreed 0 experts disagreed	Ex1: M Ex2: M



	6 experts said maybe	Ex3: M Ex4: M Ex5: A Ex6: A Ex7: A Ex8: M Ex9: A Ex10: M Ex11: A
--	----------------------	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
e) During later therapy sessions (session six onwards) in combination with different positions on the horse to challenge postural control, symmetry and balance.	4 experts agreed 2 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: A Ex7: A Ex8: M Ex9: M Ex10: D Ex11: A

Please bear in mind that the number of sessions is only a guideline and must not be seen a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
f) During later therapy sessions in combination with different ground courses to challenge the client's postural control, symmetry and balance i.e. increasing the step length on a figure of eight.	5 experts agreed 1 expert disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: A Ex7: A Ex8: M Ex9: D Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
g) During later therapy sessions in combination with directional changes.	6 experts agreed 0 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A



		Ex5: M Ex6: A Ex7: A Ex8: M Ex9: A Ex10: M Ex11: A
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Increased step length is advised:

Statement from round one	Group response	Your response
h) in more supportive positions, i.e. forearm weight bearing at first	2 experts agreed 1 expert disagreed 8 experts said maybe	Ex1: M Ex2: M Ex3: M Ex4: M Ex5: M Ex6: M Ex7: D Ex8: A Ex9: M Ex10: M Ex11: A

After taking the comments for the expert panel into consideration a statement is added to this possible guideline and the guideline will now read:

Increased step length is advised in more supported positions, i.e. forearm weight bearing.



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Guidelines regarding the client pelvic movement facilitation

Bear in mind that although the horse moves the pelvis of the client in all three dimensions, the therapist can choose a horse that emphasises movement in one plane.

Statement from round one	Group response	Your response
<p>10.14. Follow a neurodevelopmental frame of reference with regard to the progression of pelvic movements in the client namely posterior-anterior, lateral and then rotation.</p>	<p>7 experts agreed 0 experts disagreed 4 experts said maybe</p>	<p>Ex1: A Ex2: M Ex3: M Ex4: M Ex5: A Ex6: A Ex7: M Ex8: A Ex9: A Ex10: A Ex11: A</p>

After taking the comments for the expert panel into consideration a statement is added to this possible guideline and the guideline will now read:

Follow a normal pattern of neurodevelopment regarding the progression of pelvic movements (that you focus on) in the client namely posterior-anterior, lateral movement and then rotation.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Bear in mind that the use of one possible movement solution to address poor dissociation between the trunk and the lower extremities, does not exclude another possible movement solutions.

Statement from round one	Group response	Your response
10.15. Provide anterior-posterior pelvic movements when treating a client with poor dissociation between the trunk and lower extremities.	4 experts agreed 0 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: M Ex7: A Ex8: M Ex9: M Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

After taking the comments for the expert panel into consideration a new possible guideline was formulated.

New statement on pelvic movement (of the client) facilitation

10.16. Provide rotational pelvic movements when treating a client with poor dissociation between the trunk and lower extremities.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Guidelines regarding the client pelvic movement facilitation

Statement from round one	Group response	Your response
10.17. Provide lateral pelvic movement before more pelvic rotation is introduced	2 experts agreed 2 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: M Ex6: M Ex7: M Ex8: D Ex9: M Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response



<p>10.18. Start with the pelvic movement that the client already presents with (from a neurodevelopmental point of view). Then implement other treatment theories (such as vestibular stimulation and phylogenesis) to help the client reach more movement related function.</p>	<p>4 experts agreed 0 experts disagreed 6 experts said maybe 1 expert did not answer.</p>	<p>Ex1: A Ex2: M Ex3: M Ex4: - Ex5: M Ex6: M Ex7: M Ex8: M Ex9: A Ex10: A Ex11: A</p>
---	---	---

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

11. Dosage

Bear in mind that dosage encompasses duration of sessions, frequency of sessions, total number of sessions and discharge criteria)

Duration of sessions

Duration of therapy session refers to the **total time** (in minutes) spent in **one** therapy **session**.

There is already consensus on the inclusion of the following guideline:

Start by presenting shorter hippotherapy sessions and progress to longer sessions considering the physical endurance of each client.

Bear this guideline in mind when deciding on the inclusion or exclusion of the following statements.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment



Statement from round one	Group response	Your response
11.1. For clients on GMFCS I-III start with sessions between 15 to 20 minutes	4 experts agreed 2 experts disagreed 5 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: A Ex6: A Ex7: M Ex8: A Ex9: D Ex10: D Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
11.2. For clients on GMFCS I-III progress to sessions that are between 30-45 min, later in therapy.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: D Ex6: A Ex7: A Ex8: A Ex9: A



		Ex10: M Ex11: M
--	--	--------------------

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
11.3. For clients on GMFCS IV-V start with 10 minute sessions during earlier therapy	2 experts agreed 1 expert disagreed 8 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: M Ex6: M Ex7: D Ex8: A Ex9: M Ex10: M Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
11.4. For clients on GMFCS IV-V progress to sessions that are 30 min long.	3 experts agreed 2 experts disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D

		Ex6: A Ex7: M Ex8: A Ex9: D Ex10: M Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Frequency of hippotherapy sessions

Frequency is defined as **number** of therapy sessions **per week**.

There is already consensus on the inclusion of the following statements into the final hippotherapy practice guidelines.

For all clients with spastic CP, present hippotherapy sessions at least once a week.

and

For all clients with spastic CP, hippotherapy sessions may be presented twice a week.

Bear these guidelines in mind when deciding on the inclusion or exclusion of the following statement.

Statement from round one	Group response	Your response
11.5. For clients with hemiplegia on GMFCS level IV-V present sessions three times a week.	1 expert agreed 0 experts disagreed 10 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: M Ex6: M

		Ex7: M Ex8: M Ex9: M Ex10: M Ex11: M
--	--	--

Bear in mind that this statement is focused on normal therapy frequency and not on intensive block therapy.

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Number of hippotherapy sessions before re-evaluation

Re-evaluation is a continuous process, but a formal re-evaluation is done to determine if any discharge criteria apply or if new therapy goals need to be set.

Please consider both statements carefully before deciding on the inclusion or exclusion thereof into the final hippotherapy practice guidelines. This does not mean that the same standardised tests (that was used before therapy started) must be used.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
11.6. Although re-evaluation is a continuous process, do a formal re-evaluation between session five and session 10.	3 experts agreed 2 experts disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: M Ex6: A Ex7: M



		Ex8: A Ex9: M Ex10: D Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
11.7. Although re-evaluation is a continuous process do a formal re-evaluation between session 10 and sessions 20.	3 experts agreed 2 experts disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: M Ex6: D Ex7: A Ex8: A Ex9: M Ex10: M Ex11: M

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Discharge criteria.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
11.8. Clients are discharged when the client is plateauing in terms of continued skill attainment.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: A Ex3: M

		Ex4: A Ex5: A Ex6: M Ex7: M Ex8: A Ex9: D Ex10: M Ex11: A
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Dosage of intensive hippotherapy block sessions

For various reasons (such as clients that live far from therapy centres or a policy that limits the time of year that therapy is provided) therapists might decide to provide intensive block sessions to clients. This means that clients are seen more frequently (times per week) in a set time frame. For instance, only during the summer holidays.

Bear in mind that there is **already consensus** on the following guideline:

Provide intensive hippotherapy block sessions at a frequency of at least one session a week.

Please consider the following statements with the client with spastic CP in mind, irrespective of the policy that is followed within your country or centre.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
11.9. During intensive block sessions the recommended frequency of hippotherapy is at least twice a week	2 experts agreed 2 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M

		Ex4: D Ex5: A Ex6: M Ex7: M Ex8: M Ex9: D Ex10: M Ex11: M
--	--	--

With the consensus guideline in mind this possible guideline will now read:

During intensive blocks, hippotherapy sessions may be presented twice a week.

Please select agree, disagree or maybe on the inclusion of this guidelines into the final hippotherapy practice guidelines

Number of intensive hippotherapy block session

This statement refers to **total number of sessions** within such a block and **NOT** to the duration (minutes per session) of a therapy session.

Statement from round one	Group response	Your response
11.10. Provide a total of at least 12 sessions during a block of intensive therapy.	6 experts agreed 3 experts disagreed 2 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: A Ex6: D Ex7: A



		Ex8: A Ex9: D Ex10: A Ex11: A
--	--	--

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

New statement on intensive block therapy

11.11. During intensive blocks, hippotherapy sessions may be presented daily for a total period of one to two weeks.

12. Leading of the hippotherapy horse

There is already consensus on the inclusion of the following statement into the final hippotherapy practice guidelines.

Use side leading or long lining within a hippotherapy session

Bear this guideline in mind when deciding on the inclusion or exclusion of the following statements.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
12.1. Long lining in combination with side leading	4 experts agreed 4 experts disagreed 3 experts said maybe	Ex1: A Ex2: A Ex3: M Ex4: M Ex5: D Ex6: A



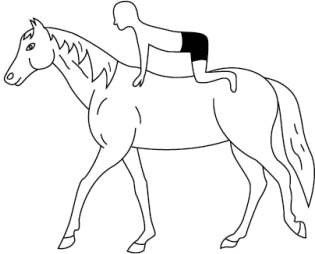
		<p>Ex7: D</p> <p>Ex8: A</p> <p>Ex9: D</p> <p>Ex10: M</p> <p>Ex11: D</p>
---	--	---

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

13. Positioning

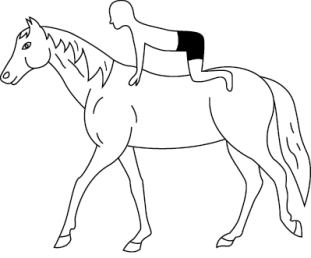
Guidelines regarding positioning of the client.

Please bear in mind that the number of sessions is only a guideline and must not be seen a rule. Therapists must always apply professional reasoning with the client's best interest at heart.

Statement from round one	Group response	Your response
<p>13.1. Introduce "all fours facing forward" during later sessions (session 6 and onward) for clients with hemiplegia on all levels.</p> 	<p>3 experts agreed</p> <p>2 experts disagreed</p> <p>6 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: M</p> <p>Ex3: M</p> <p>Ex4: M</p> <p>Ex5: D</p> <p>Ex6: M</p> <p>Ex7: D</p> <p>Ex8: A</p> <p>Ex9: A</p> <p>Ex10: M</p> <p>Ex11: M</p>

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.



Statement from round one	Group response	Your response
<p>13.2. Introduce “all fours facing forward” during later sessions (session 6 and onward) for clients with quadriplegia and diplegia on GMFCS level I-III.</p> 	<p>5 experts agreed</p> <p>3 experts disagreed</p> <p>3 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: M</p> <p>Ex3: M</p> <p>Ex4: D</p> <p>Ex5: D</p> <p>Ex6: A</p> <p>Ex7: D</p> <p>Ex8: M</p> <p>Ex9: A</p> <p>Ex10: A</p> <p>Ex11: A</p>

Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Statements that did not yet reach consensus

14. Tack and equipment

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
<p>14.1. Use a halter to lead the horse during the sessions.</p>	<p>3 experts agreed</p> <p>6 experts disagreed</p> <p>2 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: D</p> <p>Ex3: A</p> <p>Ex4: D</p> <p>Ex5: D</p> <p>Ex6: M</p> <p>Ex7: D</p>

		Ex8: A Ex9: D Ex10: D Ex11: M
--	--	--

The word halter is a synonym of headcollar and defined as a bitless headpiece for leading or tying up a horse.

After taking the comments of the expert panel into consideration the statement will now read:

Use a strap halter to lead the horse during the hippotherapy sessions.



New statement on the tack and equipment

14.2. Use a rope halter to lead the horse during the hippotherapy sessions.



Statements that did not yet reach consensus

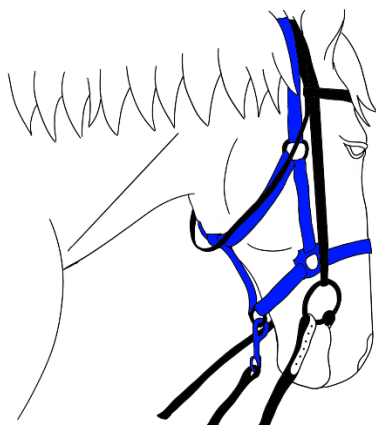
Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

For leading

Statement from round one	Group response	Your response
<p>14.3. Use both a halter and a bridle simultaneously to lead the horse during the sessions.</p>	<p>2 experts agreed</p> <p>6 experts disagreed</p> <p>3 experts said maybe</p>	<p>Ex1: D</p> <p>Ex2: M</p> <p>Ex3: M</p> <p>Ex4: A</p> <p>Ex5: D</p> <p>Ex6: M</p> <p>Ex7: D</p> <p>Ex8: A</p> <p>Ex9: D</p> <p>Ex10: D</p> <p>Ex11: D</p>

After taking the comments from the expert panel into consideration the guideline will now read:

Use both a halter and a bridle simultaneously (halter underneath the bridle) to lead the horse from either one.



Please select agree or disagree on the inclusion of this guidelines into the final hippotherapy practice guidelines.

Tack and equipment

Seating of the client

The focus of the following statements is on the amount of seating support given to the client. Both the safety and wellbeing of the client and the horse should be considered. The tack and equipment mentioned are examples and not the main focus.

Agreeing with one statement does not exclude the possible agreement with another as well. Please consider the statements carefully with the spastic CP client in mind.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

14.4. For all clients with spastic CP

Statement from round one	Group response	Your response
a) Provide little to no seating support by using i.e. bare back pad or numnah.	6 experts agreed 1 expert disagreed	Ex1: A Ex2: D



	4 experts said maybe	Ex3: M Ex4: A Ex5: A Ex6: M Ex7: M Ex8: A Ex9: A Ex10: M Ex11: A
--	----------------------	--

After taking the comments from the expert panel into consideration the statement will now read:

Provide **little to no seating support** for example using a bare back pad (typically made of sheepskin or foam) or numnah (typically made of sheepskin or material, which is usually placed under a saddle).

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

For all clients with **spastic CP**

Statement from round one	Group response	Your response
b) Provide moderate seating support by using i.e. general purpose saddle.	3 experts agreed 2 experts disagreed 6 experts said maybe	Ex1: M Ex2: M Ex3: M Ex4: D Ex5: M Ex6: M Ex7: A



		Ex8: A Ex9: A Ex10: M Ex11: D
--	--	--

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

For all clients with spastic CP

Statement from round one	Group response	Your response
c) Provide additional seating support by using i.e. a western saddle.	1 expert agreed 4 experts disagreed 5 experts said maybe 1 expert said both agree and maybe	Ex1: D Ex2: M Ex3: M Ex4: D Ex5: M Ex6: M Ex7: D Ex8: A Ex9: A; M Ex10: M Ex11: D

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

For all clients with spastic CP

Statement from round one	Group response	Your response
d) Provide stirrups	3 experts agreed 2 experts disagreed	Ex1: D Ex2: M



	6 experts said maybe	Ex3: M Ex4: M Ex5: M Ex6: M Ex7: A Ex8: A Ex9: A Ex10: M Ex11: D
--	----------------------	--

After taking the comments from the expert panel into consideration this statement will now read:

Provide stirrups for clients with spastic CP when needed to fulfil a specific goal.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Tack and equipment

Please keep the statement that you agreed upon for all clients with spastic CP (above) in mind when deciding on the inclusion or exclusion of a possible guideline within the following diagnostic groups.

Statement from round one	Group response	Your response



14.5. Provide additional support such as rollers or pillows to clients with quadriplegia	4 experts agreed 0 experts disagreed 7 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: A Ex5: M Ex6: M Ex7: A Ex8: A Ex9: M Ex10: M Ex11: M
---	---	--

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

14.6. For clients with hemiplegia.

Statement from round one	Group response	Your response
a) Provide no seating equipment at all - bare back.	3 experts agreed 6 experts disagreed 1 experts said maybe 1 expert said both agree and maybe	Ex1: A Ex2: D Ex3: D Ex4: D Ex5: D Ex6: A Ex7: D Ex8: A Ex9: A;M Ex10: M



		Ex11: D
--	--	---------

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

For clients with hemiplegia

Statement from round one	Group response	Your response
b) Provide additional support through rollers or pillows for clients on GMFCS level IV-V .	4 experts agreed 1 expert disagreed 6 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: M Ex6: A Ex7: M Ex8: A Ex9: D Ex10: M Ex11: A

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

For clients with diplegia.

Statement from round one	Group response	Your response
14.7. Provide additional support such as rollers or pillows.	1 expert agreed 2 experts disagreed 8 experts said maybe	Ex1: D Ex2: M Ex3: M Ex4: M Ex5: M Ex6: M



		Ex7: M Ex8: A Ex9: D Ex10: M Ex11: M
--	--	--

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
14.8. Clients wear riding boots when stirrups are used.	3 experts agreed 4 experts disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: M Ex5: D Ex6: D Ex7: D Ex8: A Ex9: D Ex10: M Ex11: A

After taking the comments from the expert panel into consideration this statement will now read:

Clients with spastic CP wear riding boots or other supportive footwear when stirrups are used.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

New statement on the tack and equipment

14.9. Use **safety stirrups**, when stirrups are needed to accomplish a specific goal.

Statements that did not yet reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe; C=only gave a comment

Statement from round one	Group response	Your response
14.10. Clients wear gait belts	4 experts agreed 1 expert disagreed 6 experts said maybe	Ex1: M Ex2: A Ex3: M Ex4: D Ex5: M Ex6: M Ex7: M Ex8: M Ex9: A Ex10: A Ex11: A

Please consider your answer **irrespective** of whether a gait belt (handling belt) is a legal requirement in your country.

Also consider potential (beneficial or negative) interference with movement of the client or therapy goals.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

Statement from round one	Group response	Your response
14.11. Clients wear any kind of splints should they need them.	4 experts agreed	Ex1: M



	1 expert disagreed 6 experts said maybe	Ex2: A Ex3: M Ex4: M Ex5: M Ex6: M Ex7: D Ex8: A Ex9: A Ex10: A Ex11: M
--	--	--

After taking the comments from the expert panel into consideration the statement will now read:

During hippotherapy, clients wear the splints that they normally wear. Provided that no harm is done to the horse or the client.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines.

10.19 ANNEXURE R: THIRD DELPHI ROUND

Please bear in mind that the questions were presented in Qualtrics in a survey format.

Dear hippotherapy expert panel member

Thank you so much for your dedication and contribution to this study thus far. This is the last round (third Delphi round) of this part of the study. In this round you will be presented with the “new statements” presented to you in round two that did not reach consensus and with guidelines that did reach consensus during the first round, but needed word changes in accordance with the expert panel’s comments during the first round.

Please note that the guidelines are only intended for clients with spastic cerebral palsy (CP) while **mounted** on a therapy horse. The intention is not to exclude groundwork or any other therapy that involve horses, but the focus of these guidelines is hippotherapy where the client is mounted.

Also note that guidelines on each hippotherapy concept are formulated separately, but should be considered and used simultaneously within therapy, while bearing the individual needs and goals of each client in mind as they progressed.

Before continuing with this third round of the Delphi technique, you must first decide whether you are willing to continue taking part in the study. By saying yes, you confirm the following:

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.

- I understand that I will not be penalised in any way should I wish to discontinue with the study and my withdrawal will not affect my employment or student status.
- I participate willingly.
 - Yes, I consent
 - No, I do not consent

Please provide your participant number below.

Statements that did not yet reach consensus

In round two you were presented with some new statements. The six new statements **that the experts do not yet have consensus on**, will now be presented to you in two columns. Column one shows the group response, column two shows your own individual response.

You now have the opportunity to reconsider your response from round 1 in the context of the group response. Please note that you do not have to change your original response if you do not wish to.

1. Hippotherapy team

Bear in mind that we want to give advice on the most appropriate composition of the therapy team for a client with spastic CP on a specific GMFCS level.

This does not mean that this is the only possible composition of the therapy team. Other team compositions already reached consensus.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe

Size and composition of the hippotherapy team for **GMFCS levels IV and V**.

Statement from round one	Group response	Your response



14.12. A therapy team may consist of three people <ul style="list-style-type: none">• one trained therapist (in hippotherapy)• one therapist in hippotherapy training on the other side of the client as side walker• a horse handler handles the horse	6 experts agreed	Ex1: D
	2 experts disagreed	Ex2: A
	3 experts said maybe	Ex3: M
		Ex4: A
		Ex5: M
		Ex6: A
		Ex7: A
		Ex8: A
		Ex9: D
		Ex10: M
		Ex11: A

After taking the comments of the expert panel into consideration the wording is changed to:

A therapy team may consist of three people

- one therapist qualified in hippotherapy
- one therapist undergoing hippotherapy training, walking on the other side of the client
- a horse handler that handles the horse

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

Agree

Disagree

2. Horse size

Height

Bear in mind that consensus is already reached on the inclusion of the following statements:



- 2.1. For clients on GMFCS levels I, II or III, the back of the horse can vary from the same height as the therapist's waist to the same height as the therapist's chest.
- 2.2. For clients on GMFCS levels IV or V, the back of the horse is the same height as the therapist's chest.

Key for abbreviations on group response: A=agree; D=disagree; M=maybe

Statement from round one	Group response	Your response
2.3. Select a horse such that their back is in line or at the same height as the therapist's shoulders when treating clients on GMFCS levels I-III.	6 experts agreed 1 expert disagreed 4 experts said maybe	Ex1: A Ex2: M Ex3: M Ex4: D Ex5: A Ex6: A Ex7: A Ex8: A Ex9: A Ex10: M Ex11: M

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
- Disagree

Key for abbreviations on group response: A=agree; D=disagree; M=maybe

Statement from round one	Group response	Your response
2.4. Select a horse such that their back is in line or at the same height as the	1 expert agreed	Ex1: D



<p>therapist's shoulders when treating clients on GMFCS levels IV-V.</p>	<p>5 experts disagreed 5 experts said maybe</p>	<p>Ex2: M Ex3: M Ex4: D Ex5: A Ex6: D Ex7: M Ex8: D Ex9: M Ex10: M Ex11: D</p>
--	--	---

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
- Disagree

3. Horse movement

In walk, the step of each hoof (step length is equally long, symmetrical and ground-covering. When increasing a horse's walking speed, the step length often (but not necessarily) also increase.

Before deciding on the following statement regarding the step length of a hippotherapy horse, please keep in mind that it might be difficult (but not impossible) for both the horse and the horse handler to alter step length in hand while keeping the speed constant.

The following statement already reached consensus:

- 3.1. When different step length is needed for a client, consider using a different horse.

Statement that did not reach consensus

Key for abbreviations on group response: A=agree; D=disagree; M=maybe



New statement presented in round two	Group response	Your response
3.2. Consider a change in walking speed (easier to accomplish in hand) rather than step length change within a session.	6 experts agreed 3 experts disagreed 2 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: A Ex5: A Ex6: A Ex7: D Ex8: A Ex9: M Ex10: D Ex11: A


Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
- Disagree

4. Horse tack and therapy equipment

Key for abbreviations on group response: A=agree; D=disagree; M=maybe

Statement from round one	Group response	Your response
4.1. Use a rope halter to lead the horse during the hippotherapy sessions.	2 experts agreed 5 experts disagreed 4 experts said maybe	Ex1: A Ex2: D Ex3: M Ex4: D Ex5: A

		<p>Ex6: M</p> <p>Ex7: M</p> <p>Ex8: M</p> <p>Ex9: D</p> <p>Ex10: D</p> <p>Ex11: D</p>
---	--	---

After taking the comments of the expert panel into consideration the wording is changed to:

Use a rope halter to lead the horse during the hippotherapy sessions depending on the horse's training.

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
- Disagree

Key for abbreviations on group response: A=agree; D=disagree; M=maybe

Statement from round one	Group response	Your response
<p>4.2. A mounting ramp is used to mount clients.</p>	<p>5 experts agreed</p> <p>0 expert disagreed</p> <p>6 experts said maybe</p>	<p>Ex1: A</p> <p>Ex2: M</p> <p>Ex3: M</p> <p>Ex4: M</p> <p>Ex5: M</p> <p>Ex6: M</p> <p>Ex7: A</p>

		Ex8: A Ex9: A Ex10: M Ex11: A
--	--	--

Please select agree or disagree on the inclusion of this statement into the final hippotherapy practice guidelines

- Agree
- Disagree

Statements that have consensus but might need word changes

In round one the expert panel reached consensus on the inclusion of some statements into the final hippotherapy practice guidelines. Comments from the panel on these 30 statements were taken into consideration and are now presented to you.

You will be presented with both the original wording and the new suggested wording.

Should you choose **agree**, the suggested **new wording** will be used in the final hippotherapy practice guidelines. Should you **disagree**, the **original wording** will be used.

1. General

The statement was:

- 1.1. Before any physical handling of a client, the therapist will explain the need for such physical handling to the client, parents and care givers and obtain their permission.

After taking the comments of the expert panel into consideration the wording is changed to:

Prior to any treatment, that therapy is explained to the client, parents and care givers and permission (written and verbal) is obtained, including an explanation of the need for physical handling if applicable.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

2. Therapists

Please note that the study is done at the University of Pretoria and the titles used in this document for each profession are those used in South Africa, namely occupational therapist, physiotherapist and speech and language pathologist.

The statement was:

- 2.1. Hippotherapy is used by occupational therapists (OTs), physiotherapists (PTs) or speech and language pathologists (SLPs) in intervention.

After taking the comments of the expert panel into consideration the wording is changed to:

Hippotherapy can be used as a treatment tool by occupational therapists (OTs), physiotherapists (PTs) or speech and language pathologists (SLPs) in intervention.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

The statement was:

- 2.2. A therapist registered with the professional health and care council of their country executes every hippotherapy session.

After taking the comments of the expert panel into consideration the wording is changed to

A therapist registered with the professional health and care council of their country (if required by their countries law) could use hippotherapy as a treatment tool in an occupational therapy, physiotherapy or speech and language pathology session.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

3. Horse temperament

Definition

Bombproof horse - A bombproof horse is not overly tactile, sound or visually sensitive, not flighty and does not spook easily. A bombproof horse is robust (sturdy, tough and steady) and confident.

The statement was:

- 3.1. Use a hippotherapy horse that is bombproof when treating clients on GMFCS levels I-III.

After taking the comments of the expert panel into consideration wording was added to the statement:

Use a hippotherapy horse that is bombproof when treating clients on GMFCS levels I-III. (Please bear in mind that “bombproof” does not mean that the horse is slow. Also bear in mind that even the most bombproof horse can still react in an unexpected manner.)

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

Definition



Unruffled horse - An unruffled horse responds in a composed, unmoved and controlled manner to external stimuli or demands.

The statement was:

- 3.2. Use a hippotherapy horse that is bombproof and unruffled when treating clients on GMFCS levels IV-V, because this group is likely to display unexpected behaviour and might need more physical manipulation from the therapist and side walker.
(90.9% consensus)

After taking the comments of the expert panel into consideration the wording is changed to:

Use a hippotherapy horse that is not only bombproof but also unruffled when treating clients on GMFCS levels IV-V, because this group is likely to display unexpected behaviour and might need more physical manipulation from the therapist and side walker.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree



Physical handling

The statement was:

- 3.3. Therapists give hands-on support to clients on GMFCS levels I to III only as needed.

After taking the comments of the expert panel into consideration the wording is changed to
Therapists give hands-on support and/or facilitation to clients on GMFCS levels I to III only as needed.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
 Disagree

The statement was:

- 3.4. Therapists give some form of hands-on support throughout every hippotherapy session to clients on GMFCS levels IV to V for safety purposes.

After taking the comments of the expert panel into consideration the wording is changed to
Therapists give some form of hands-on support to clients on GMFCS levels IV to V throughout every therapy session when using hippotherapy, to provide stability where needed, correct posture if applicable and for safety purposes as required.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
 Disagree

The statement was:

- 3.5. Therapists move their hands to a different key point of control or lessen support when the client start leaning into the support.

After taking the comments of the expert panel into consideration the wording is changed to
Therapists move their hands to a different key point of control or lessen support when the client starts leaning into the support, provided that the client is not fatigued.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

The statement was:

3.6. Hands-on support should stabilise and/ or facilitate but not interfere with posture and movement.

After taking the comments of the expert panel into consideration the wording is changed

Hands-on support	Agree	Disagree
a. Should stabilise and/ or facilitate movement.		
b. May be needed to obtain, maintain, or improve, postural alignment.		
c. Should not interfere with posture and movement.		

The statement was:

3.7. Therapists consider maximum movement of their clients when choosing the key point of control without compromising safety.

After taking the comments of the expert panel into consideration the wording is changed to
Therapists consider the best functional movement of their clients when choosing the key point of control without compromising safety.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree

Disagree

4. Theoretical framework

The statement was:

4.1. The most suitable combination of the following frames of references are used when treating clients.

After taking the comments of the expert panel into consideration the wording is changed to

The most suitable frames of references that are safe to implement on a horse are used when treating clients, provided that the therapist is familiar with them.

- Biomechanical Frame of Reference for Positioning Children for Functioning
- Cognitive Disability Frame of Reference (Claudia Allen)
- Dynamic systems theory
- Ecology of Human Performance (EFP) (Winnie Dunn)
- Enhance Childhood occupations
- Enhance social participation
- Model of creative participation (Vona du Toit)
- Model of Human Occupation (Kielhofner)
- Motor Skill Acquisition
- Neurodevelopmental Treatment (Bobath)
- Sensory Integration (Ayres)
- Vojta's rehabilitation (Vojta)

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

5. Precautions

5.1. The following precautions are taken into consideration when treating clients

The statement was:

a. Do additional investigation, such as contacting the physician, before treating a client.

After taking the comments of the expert panel into consideration the wording is changed to

If an initial referral letter from a physician is not required in your country and/ or more medical information is needed, contact the treating physician (with the client, parent or care taker's permission) before treating a client.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

The statement was:

b. Give the client extra verbal instructions on positions and functional activities while mounted

After taking the comments of the expert panel into consideration the wording is changed to

Enhance physical assistance with verbal instructions on positions and functional activities while mounted

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

The statement was:

c. Adapt positioning due to adductor tightness.

After taking the comments of the expert panel into consideration the wording is changed to

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Accommodate adductor tightness by:	Agree	Disagree
I. Selecting a narrower horse		
II. Using long strides on long straight lines		
III. Adapting positioning on the horse		
IV. Careful selection of equipment		

The statement was:

- d. Seek alternative head protection (not standard riding hats) to accommodate poor head control.

After taking the comments of the expert panel into consideration the wording is changed to

Seek alternative head protection (not standard riding hats) to accommodate poor head control or different shaped head, provided that the parents or caregiver gave written consent.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

The statement was:

- e. Allocated first aider (could be therapist) thorough assessment of client before use of equine (at least one assessment session) and information from known therapists. (91% consensus round 1)

After taking the comments of the expert panel into consideration the wording is changed to



An allocated, trained first aider (therapist or side walker) should be present within every therapy session, should first aid be needed.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

6. Horse size

Width

The statement was:

- 6.1. Take the client's physical size into consideration when deciding on the width of a horse.

After taking the comments of the expert panel into consideration the wording is changed to:

Consider the client's physical size, muscle tone, pelvic position and hip range of motion when deciding on the width of a horse.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

The statement was:

- 6.2. Use a broader pony when considering alternative positions that can benefit from a broader base.

Bear in mind that the term "hippotherapy horse" will be used in the final guidelines and will encompass all equines, including ponies that are used for hippotherapy.

After taking the comments of the expert panel into consideration the wording is changed to
Use a broader hippotherapy horse when considering alternative positions that would benefit from a broader base but be cautious of the influence thereof on the client's hips and pelvis.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

7. Horse movement

Bear in mind that although horses move the pelvis of the client in all three dimensions, the therapist can choose a horse that emphasises movement in one plane.

Also bear in mind that one movement suggestion does not exclude other movement possibilities.

The statement was:

7.1. For all clients with spastic CP:

- a. Use a horse with smooth but collected movement (a balanced horse).

Bear in mind that "collection" occurs when a horse's centre of gravity is shifted backwards and might be difficult to achieve while the horse is led by a horse handler.

After taking the comments of the expert panel into consideration the wording is changed

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

For clients with spastic cerebral palsy:	Agree	Disagree
I. Use a balanced horse		
II. Consider using a horse with smooth and long striding movements when the client starts hippotherapy.		

Step length of the horse

In walk, the step of each hoof (step length) is equally long, symmetrical and ground-covering. When increasing a horse's walking speed, the step length often (but not necessarily) also increase.

Please keep in mind that it might be difficult (but not impossible) for both the horse and the horse handler to alter step length in hand while keeping the speed constant. A hippotherapy horse can be trained to alter step length and/or tempo.

The statements were:

7.2. Before considering increased step length, the client should...:

- b. Have good head control.

After taking the comments of the expert panel into consideration the wording is changed to:

Before considering increased step length, the client should have good head control or be small enough that the head can be supported safely by the therapist or equipment

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

- c. Be able to accommodate the postural movements as presented at the current step length.

After taking the comments of the expert panel into consideration the wording is changed to:

Before considering increased step length, the client should be able to accommodate the postural movements as presented at the current step length or be small enough that the therapist can support the client safely through manual support or equipment.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines



Agree

Disagree

Pelvic movement facilitation

The statement was:

7.3. Increased step length is advised when more pelvic movement is needed.

After taking the comments of the expert panel into consideration the wording is changed to:

Increased step length is advised when more or different pelvic movement is needed.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

8. Dosage

Dosage is the duration of sessions, frequency of sessions, total number of sessions and discharge criteria)

Statements regarding dosage of intensive hippotherapy block sessions

For various reasons (such as clients that live far from therapy centres or a policy that limits the time of year that therapy is provided) therapists might decide to provide intensive block sessions to clients. This means that clients are seen more frequently (times per week) in a set time frame. For instance, only during the summer holidays.

The statement was:

8.1. During intensive blocks, hippotherapy sessions may be presented daily for a total period of one to two weeks.

After taking the comments of the expert panel into consideration the wording is changed to:

Intensive blocks of hippotherapy may be presented daily for a total period of one to two weeks, provided that the client can tolerate the effects of daily sessions.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

Discharge criteria

The statement was:

8.2. It is recommended that clients are discharged when they have reached their therapy goals set at onset of therapy. (64% consensus round1)

After taking the comments of the expert panel into consideration the wording is changed to:

It is recommended that clients are discharged when they have reached their therapy goals set at onset of therapy and new goals setting is not possible for any reason.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

9. Horse tack and therapy equipment

The statement was:

9.1. Use a bridle to lead the horse during the sessions

After taking the comments of the expert panel into consideration the wording is changed to:

A bridle can be used to lead the horse during the sessions, depending on the horse's training

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines



Agree

Disagree

The statement was:

9.2. Clients wear light weight safety helmets.

After taking the comments of the expert panel into consideration the wording is changed to:

If there are no contra-indications, clients wear light weight safety helmets, according to the safety regulations in your country.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

The statement was:

9.3. Clients wear any comfortable training shoes when stirrups are not used.

After taking the comments of the expert panel into consideration the wording is changed to:

Clients wear any comfortable training shoes or bare feet (with or without socks) when stirrups are not used.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

Agree

Disagree

The statement was:

9.4. Clients wear normal clothing that is appropriate for the specific weather conditions.

After taking the comments of the expert panel into consideration the wording is changed to:

Clients wear long pants and any top that are comfortable, moveable and appropriate for the weather conditions.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

10. Physical environment

The statement was:

10.1. Hippotherapy is conducted at the available facilities.

After taking the comments of the expert panel into consideration the wording is changed to:

Hippotherapy is conducted at safe and available facilities that are suitable for hippotherapy.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree
- Disagree

The statement was:

10.2. Hippotherapy facilities should include both indoor and outdoor facilities.

Hippotherapy facilities should ideally, but not necessarily, include both indoor and outdoor facilities.

Please select agree or disagree on the inclusion of the changed wording into the final hippotherapy practice guidelines

- Agree



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Disagree

10.20 ANNEXURE S: NON-CONSENSUS STATEMENTS

The following guidelines statements did not reach consensus on either inclusion or exclusion.

Activity characteristics

1. Possible activities for clients with hemiplegia and diplegia on GMFCS level IV-V are active exercises such as sit-ups, laying down, standing up, lifting medicine balls etc.

Horse breed

2. Cross-bred ponies are preferred for hippotherapy.
3. Part-bred Welsh ponies are preferred as horse breed for hippotherapy.

Horse size

4. For clients on GMFCS levels I, II or III the back of the horse is in line or at the same height as the therapist's waist.
5. Select a horse such that their back is in line or at the same height as the therapist's shoulders when treating clients on GMFCS level IV-V.

Horse movement

6. For clients with hemiplegia use a faster gait.
7. Introduce the gaits in the following order for clients on all GMFCS levels: When trotting is introduced start at a slow trot and progress to a medium trot.
8. For GMFCS level IV-V add the following in later sessions (session 6 onward) Use altering walking speeds then transition from halt – walk – halt, then halt - walk - trot and back trot – walk- halt.
9. Increased step length is advised during later therapy sessions (session six onwards).
10. Increased step length is advised in more supported positions, i.e. forearm weight bearing.
11. Regarding pelvic movement facilitation of the client, provide lateral pelvic movement before more pelvic rotation is introduced.



Dosage

12. Although re-evaluation is a continuous process, do a formal re-evaluation between session five and session 10.

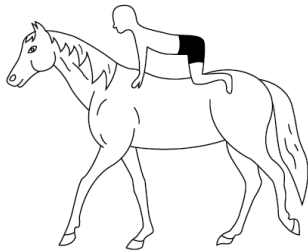
Manner of leading

13. Long lining in combination with side leading



Positioning of the client

14. Introduce “all fours facing forward” during later sessions (session 6 and onward) for clients with **hemiplegia** on all levels.



Tack and equipment

15. Use a strap halter to lead the horse during the hippotherapy session.





16. For all clients with spastic CP provide additional seating support by using i.e. a western saddle.
17. Provide additional support such as rollers or pillows for clients with **diplegia**.
18. Clients wear gait belts.