**THE CLINICAL RELEVANCE OF AN ASSESSMENT PROTOCOL
ADMINISTERED ON CHILDREN WITH COCHLEAR IMPLANTS**

By

Katerina Yiallitsis

July 2006

In partial fulfillment of the requirements
for the degree M Communication Pathology
at the Department of Communication Pathology,
Faculty of Humanities, University of Pretoria, South Africa

ACKNOWLEDGMENTS

The author would like to thank the following people for their contributions:

ABSTRACT

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By

KATERINA YIALLITSIS

SUPERVISOR: **Mrs. P.H. Venter**

CO-SUPERVISOR: **Dr. L. Pottas**

DEPARTMENT: **Communication Pathology,**

                           University of Pretoria, South Africa

DEGREE: **M Communication Pathology**

Some children with severe to profound hearing loss are implanted with a cochlear implant on the hypothesis that short-term outcomes in auditory receptive skills can be utilized into greater social independence and quality of life. In order to measure the outcomes and progress achieved from cochlear implants, effective assessment protocols are vital. The purpose of assessment after cochlear implantation, is to monitor an individual child's rate of progress in speech and language acquisition, with reference to other cochlear implant users; to collect data on the range of linguistic benefits observed against cochlear implant users over time and to investigate and amend unforeseen difficulties. Furthermore, the outcome measures provide concrete information to the multidisciplinary team, and parents, and for collection of prevalence data for further research, which is crucial for funding purposes. The dynamic and natural approach to assessment has been recommended as the most effective, to ensure a holistic assessment in young children with cochlear implants.

The aim of the current study was to determine the relevance of an assessment protocol proposed by the Pretoria Cochlear Implant Programme. The protocol was administered on eight children in the transitional stage of spoken language development, within an inclusive educational setting. A descriptive research design was selected in order to

describe the qualitative results obtained during the study. The following assessments were included in the protocol: A questionnaire on background information, an aided audiogram (with cochlear implants and hearing aids), speech discrimination, Speech in Noise Test; Developmental Assessment Schema (Auditory Communication), Developmental Assessment Schema (General Development), Rossetti Infant-Toddler Language Scale, Reynell Developmental Language Scales III (Verbal Comprehension), Speech Intelligibility Rating, Voice Skills Assessment, Preschool Literacy Assessment, Mother Infant Communication Scale, Caregiver-Child Interaction, Meaningful Auditory Integration Scale, Meaningful Use of Speech Scale and Profile of Actual Linguistic Skills.

The results indicated that all the vital areas of assessment are included in the protocol, and under-evaluation is not a concern. Some of the areas of assessment overlap in the protocol, ensuring that the cross-check principle is being applied. The information gained from the assessment protocol can be used effectively for future intervention planning and adaptations can be made where necessary. Moreover, it was concluded that the administration and interpretation of the assessment protocol is time efficient and can be used effectively within a clinical setting. Cultural barriers did not have an effect on the administration and interpretation of the assessment protocol, however, linguistic barriers can influence the outcome of the results obtained. In summary, the assessment protocol has been found to be innovative, time effective, user-friendly, informative and relevant for the assessment of young cochlear implant users in the transitional stage of verbal linguistic development. Recommended changes for the assessment protocol were suggested, as well as recommendations for the educational setting. It was suggested that the questionnaires be available in all South African languages and that some of the protocols only be used if age-appropriate. Another recommendation was that the Listening Progress (LiP) and a pragmatic profile should be included in the protocol. Furthermore, it was suggested that an assistant audiologist could be involved to ensure more accurate and quicker hearing assessments.

Keywords: *Cochlear implants, relevance, assessment, protocol, multidisciplinary team, outcomes, intervention, cross-check principle, paediatrics, cultural and linguistic barriers, inclusive educational setting.*

OPSOMMING

**DIE KLINIESE TOEPASLIKHEID VAN 'N
ASSESSERINGSPROTOKOL UITGEVOER
OP KINDERS MET KOGLEêRE INPLANTINGS**

Deur

KATERINA YIALLITSIS

STUDIELEIER:	**Mev. P.H. Venter**
MEDE-STUDIELEIER:	**Dr. L. Pottas**
DEPARTEMENT:	**Kommunikasiepatologie,**
	Universiteit van Pretoria, Suid Afrika
GRAAD:	**M Kommunikasiepatologie**

Kogleêre inplantings is verskaf aan kinders met erge en uitermatige of totale gehoorverliese, op grond van die hipotese dat kort-termyn uitkomste in ouditiewe reseptiewe vaardighede benut kan word en verder ook kan lei na uitkomste wat aan hierdie kinders groter sosiale onafhanklikheid en 'n beter lewenskwaliteit kan gee. Effektiewe evalueringsprotokolle is essensieel om die uitkomste en vordering van kinders met kogleêre inplantings te meet. Die doel van evaluering na kogleêre inplantings is om 'n individuele kind se tempo van vordering in spraak- en taalontwikkeling te meet, in vergelyking met ander kinders met kogleêre inplantings. Verder om data oor die linguistiese voordele wat waargeneem is in kinders met kogleêre inplantings, in te samel oor 'n tydperk en om laastens in die posisie te wees om onverwagte probleme te ondersoek en dadelik aan te spreek. Wêreldwyd doen alle programme wat kinders met kogleêre inplantings het, navorsing. Die uitkomste van navorsing word aangewend vir verdere motivering vir fondse vir toekomstige kandidate. Die dinamiese en natuurlike benadering tot evaluering is voorgestel as die mees effektiewe benadering om 'n holistiese evaluering van jong kinders met kogleêre inplantings te verseker.

Die doel van die huidige studie was om die toepaslikheid van 'n evalueringsprotokol, wat ontwikkel is deur die Pretoria Kogleêre-Inplantingsprogram, te bepaal. Die

evalueringsprotokol is op agt kinders in die oorgangs-stadium van verbale taalontwikkeling toegepas, in 'n instansie vir inklusiewe onderwys. 'n Beskrywende navorsingsontwerp is geselekteer om die kwalitatiewe resultate wat verkry is, te beskryf. Die volgende evaluerings is in die protokol ingesluit: 'n vraelys met agtergrondsinligting, 'n oudiogram van versterkte drempels (met kogleêre inplantings en gehoorapparate), spraakdiskriminasie, Spraak in Geraas Toets; "Developmental Assessment Schema" (Ouditiewe Kommunikasie), "Developmental Assessment Schema" (Algemene Ontwikkeling), "Rossetti Infant-Toddler Language Scale", "Reynell Developmental Language Scales III" (Verbale Begrip), "Speech Intelligibilty Rating", "Voice Skills Assessment", "Preschool Literacy Assessment", "Mother Infant Communication Scale", Ouer-Kind Interaksie, "Meaningful Auditory Integration Scale", "Meaningful Use of Speech Scale" en die "Profile of Actual Linguistic Skills".

Die resultate het aangedui dat al die essensiële areas van evaluering ingesluit is by die protokol, wat aandui dat onder-evaluering nie 'n bekommernis is nie. Party van die areas van evaluasie oorvleuel, wat verseker dat die kruis-kontrole beginsel toegepas is. Verder, kan die afleiding gemaak word dat die toepassing en interpretasie van die evalueringsprotokol tyd-effektief is, en dat dit ook effektief in 'n kliniese instansie gebruik kan word. Kulturele aspekte het nie 'n invloed op die toepassing en interpretasie van die evalueringsprotokol gehad nie, alhoewel linguistiese aspekte die uitkomste van die resultate kan beïnvloed. Ter opsomming, is die evalueringsprotokol kreatief, tyds-effektief, gebruikers-vriendelik, insiggewend en relevant vir die evaluering van jong kinders met kogleêre inplantings in die oorgangsstadium van verbale taalontwikkeling. Veranderinge vir die evalueringsprotokol is aanbeveel, asook aanbevelings vir die opvoedkundige instansie. 'n Aanbeveling is gemaak dat die vraelyste in alle Suid-Afrikaanse tale beskikbaar behoort te wees, asook dat sekere van die evaluasies net gebuik moet word as dit ouderdomstoepaslik is. 'n Verdere aanbeveling was dat die "Listening Profile" (LiP) en 'n pragmatiese profiel ingesluit moet word by die protokol. Verder was dit aanbeveel dat meer akkurate en vinnige gehoortoetse moontlik sal wees indien 'n hulpoudioloog betrokke kan wees.

Sleutelwoorde: *Kogleêre inplantings, toepaslikheid, evaluering, protokol, multi-disiplinêrespan, uitkomste, intervensie, kruis-kontrole beginsel, pediatrie, kulturele en linguistiese aspekte, instansie vir inklusiewe onderwys.*

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

ABBREVIATIONS

Abbreviations used in the text are as follows.

ABBREVIATION	TERM
ABR	Auditory Brainstem Response
CDI	Child Development Inventory
CIAI	Cochlear Implant Association, Inc
DAS	Developmental Assessment Schema
EBP	Evidence-Based-Practise
EURO-CIU	European Association for Cochlear Implant Users
FSST	Fundamental Speech Skills Test
GSI	Grason-Stadler, Inc
LiP	Listening Progress
MAIS	Meaningful Auditory Integration Scale
MICS	Mother-Infant Communication Screening
MLU	Mean Length of Utterance
MUSS	Meaningful Use of Speech Scale
PALS	Profile of Actual Linguistic Skills
PASS	Profile of Actual Speech Skills
PBHL	Phonetically-Balanced Hearing Level
PB-max	Maximum score for phonetically-balanced words
SALT	Systematic Analysis of Language Transcripts
SIR	Speech Intelligibility Rating
VSA	Voice Skills Assessment
WIPI	Word Intelligibility Picture Identification Test