APPENDIX A

BEGINNING COMMUNICATION INTERVENTION PROTOCOL (BCIP) FOR CHILDREN WITH SEVERE DISABILITIES

An In-Service Training Protocol for Community Nurses

AIMS OF THE TRAINING

- To discuss the concept of multiskilling and to highlight the role of community health nurses in the process of training beginning communication skills.
- To discuss the different communication means (including aided and unaided strategies), functions and opportunities for interaction.
- To facilitate the development of skills related to
  - the implementation of unaided strategies (e.g. facial expressions and manual signs)
  - the implementation of aided strategies (e.g. objects, photographs, PCS displayed on communication boards and voice output devices)
  - The creation of ongoing communication opportunities
- To discuss and demonstrate basic augmentative and alternative communication (AAC) intervention principles
- To describe the importance of monitoring progress through the use of a progress matrix

1 TRAINING PHILOSOPHY

1.1 What is problem-based learning (PBL)?

PBL is a technique aimed at integrating theory and practice. This implies that the focus is not on memorising facts, but rather on how to apply relevant facts, i.e. it is not only important *what* is known, but also how this knowledge is applied (Brandon & Majumdar, 1997).

One of the basic principles of PBL includes the use of case studies based on real life experiences. Time should also be allocated for hands-on experiences.

1.2 What are the advantages of using PBL?

- It uses existing nursing knowledge and skills
- It facilitates critical thinking and problem-solving skills, so that existing knowledge can be applied to new cases
- It facilitates the application of skills to own context at the end of the training (Blackman, 1995; Givens-King, Sebastian, Stanhope & Hickman, 1997; Jacobs, 1997; Savin-Badin, 1997)

1.3 How does one go about answering a case study?

When answering a case study, it is the process that is important, rather than the answer. This protocol suggests a 5-point plan, adapted from Berger (1980), when answering a case study.

1 **Step 1: Clarify the terms and concepts in the problem.**

Ensure that all the terms and concepts are understood. If unsure, consult a dictionary, other group members or the trainer.

2 **Step 2: Define the problem**

Determine exactly which aspect of the problem or case study must be addressed

3 **Step 3: Analyse the problem**

Brainstorming. Formulate ideas and make assumptions about the case, e.g. if the mother has a spaza shop the customers are potential communication partners. Write down all the ideas without criticism. When all the ideas have been given, go through all of them and accept or reject them. Ideas might come from:

- Previous knowledge ("*I remember that…"*)
- Attempts to explain aspects of the problem ("*Perhaps what is happening here is…*")

4 **Step 4: Prepare a systematic answer based on the points identified in**

Step 3

Search for possible solutions to the problem. Organise all the information in a systematic way.

5 **Step 5: Report back**

Present methods and findings in some way, e.g. oral feedback, written feedback, transparencies, posters, etc.

2 INTRODUCTION

(Start by showing three video cases: one of a child trying to communicate but who is totally unintelligible, one of a child with challenging behaviour and one of a passive child. Discuss the difficulties these children experience).

- Why is it so difficult to work with children with severe disabilities (CSDs)?
  - they cannot make themselves understood easily
  - they may be passive – either partially or completely
  - they may have challenging behaviour
  - they seem to understand more than they are able to communicate
  - they are often not motivated to communicate
  - they often do not have anything to communicate about
  - they often do not have anybody to communicate with

3 DEFINING THE CONCEPT…

- What do CSDs have in common?
  - there are no "*typical CSDs*" – they include children with Down Syndrome, intellectual impairment, cerebral palsy, etc.
  - they come from all age, socio-economic and ethnic groups
  - what they have in common is only their degree of dependence on services and support.
  - *"A severely disabled child is one who, because of the intensity of physical, mental or emotional problems, or a combination of such problems, needs educational, social, psychological and medical services beyond those which have been offered by traditional regular and special education programs, in order to maximise his full potential for useful and meaningful participation in society and for self-fulfilment. Such children include those classified as seriously emotionally disturbed (schizophrenic and autistic), profoundly and severely mentally retarded, and those with two or more serious handicapping conditions such as the mentally retarded deaf, and the mentally retarded blind"* (US Department of Education in Sailor & Guess, 1983,p5).

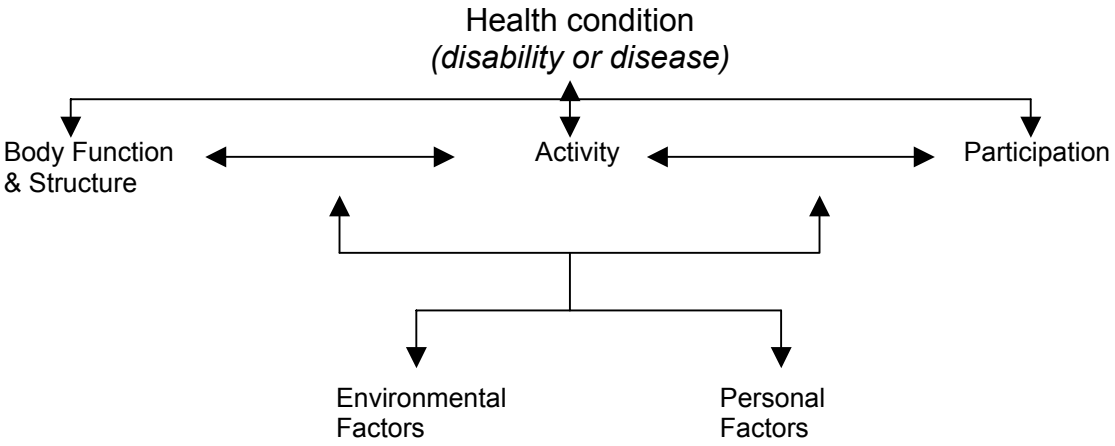
- This protocol uses the ICIDH-2 (International Classification of Functioning and Disability) developed by the World Health Organisation as framework (WHO, 1999)[1].
- ICIDH-2 looks at functioning and disability from the perspective of an individual's life circumstances and does not attempt to "*label people*".
- Looks at functioning and disability on three levels:
  - **Body level/ Body functions and structure** (The physiological and psychological functioning of body systems and the body structure, i.e. the anatomic parts such as the organs, limbs and their components)

[1] After the BCIP was developed and all the data collected, the WHO changed their interim terminology of the ICIDH-2 (WHO, 1998) to a finalised term: ICF: International Classification of Functioning, Disability and Health (WHO, 2001).

- **Individual level/ Activities** (the range of activities performed by an individual)
- **Society level/Participation** (opportunities and/or barriers that impact on the areas of life in which the individual is involved, or has access to)

- Contextual factors are an integral component of the classification and consist of:
  - **Environmental factors** (they have an external influence on functioning and can impact on all three levels. They are extrinsic (outside of the individual) e.g., the attitudes of society, architectural characteristics or the legal system. Environmental factors are organised from the immediate environment to the general environment)
  - **Personal factors** (they have an internal influence on functioning and may include gender, age, other health conditions, fitness, lifestyle, habits, coping styles, social background, education, past and current experience, overall behaviour patterns, individual psychological assets and other characteristics)

- ***Functioning*** is the umbrella term used to indicate positive aspects on all three levels
- ***Disability*** is the umbrella term used for the negative aspects (problems) on all three levels



From the above it is clear that functioning and disability are seen as a complex relationship between the health condition and the contextual factors (e.g. environmental or personal factors). Disability is thus seen as a multi-dimensional phenomenon resulting from the impaired interaction between people and the environment. The focus should not be on the **dis**ability but on the **ability** and how that can be used optimally to ensure full participation in everyday activities.

4 WHAT CAUSES SEVERE DISABILITY?

The aetiology is not always clear, but may be caused by:

- **Genetic factors**: inborn metabolic errors, e.g. PKU, congenital factors (e.g. Fragile X Syndrome), chromosome deficiencies (e.g. Down syndrome), etc.
- **Peri-natal factors** (e.g. rubella, drugs, alcohol, malnutrition). Foetal Alcohol Syndrome is the most common preventable cause of intellectual impairment worldwide (Viljoen, 1999). In a study conducted in the Western Cape, 55% of the women in the sample admitted to varying degrees of alcohol ingestion during their current pregnancy, of which the drinking patterns and intake of 23,7% was sufficient to place their unborn children at high risk for Foetal Alcohol Syndrome (FAS)(Croxford & Viljoen, 1999).
- **Birth injuries** (e.g. anoxia).
- **Injuries, accidents and childhood diseases** (e.g. meningitis, poisoning, motor vehicle accidents, malnutrition, poor sanitation, poor water supplies, etc.).
- **Environmental factors**: factors that impact on this include the amount of stimulation, how stimulation is provided, teaching style of primary caregivers, expectations of primary caregivers, presence of a father, amount of family stress, poverty, etc.

5 WHY SHOULD COMMUNITY NURSES KNOW ABOUT DISABILITY?

- Health care for CSDs offers a special challenge to community health nurses as they come into contact with children who are able to participate on different levels, depending on the degree and type of disability. In about 90% of cases intellectual impairment is moderate (IQ of 50 – 70) and with proper support and nurturing these children can live and learn in the community.
- Most of these children live at home with their primary caregivers (or extended families) and thus need to adapt to community living, making it mandatory that their needs be viewed within the context of the family and the community.
- The impact of disability is profound. It is permanent, placing high financial and caring demands on the family and on the community.
- The move is away from institutionalisation to "*inclusion*" of CSDs in all aspects of community living and learning (increased participation of CSDs).
- Nurses are part of the health care team and often act as the bridge between the primary caregivers and the medical team. Primary caregivers usually perceive the nurse as an approachable and concerned advisor who can identify with the problems that concern the family. They will thus discuss problems with her that they feel are too trivial to discuss with the doctor. In addition the nurse also contributes valuable knowledge to the rest of the team due to her particular training, expertise and function.
- Trans-disciplinary functioning in a team is necessary when implementing community-based, family-centred and co-ordinated health care to disabled children and their families (ASHA, 1989).
- In view of the shortage of qualified health care professionals in South Africa, the community nurse is ideally positioned to provide services to primary caregivers of young children with disabilities. She is equipped to perform this task as she is viewed as a sensitised professional who has the skills to observe behavioural patterns and environmental concerns and thus to make recommendations where necessary.
- In order to equip nurses for this task, the concept of "*multiskilling*" must be addressed. Multiskilling, a form of role diversification, refers to the cross-training of a service provider, in this case community nurses, to perform procedures and functions in two or more disciplines (Salvatori, 1997).

Multiskill level	Nursing task	Application to disability	Outcome
Level 1 Cross-training of basic patient care skills			The current training protocol will not address this level of multiskilling.
Level 2 Cross-training of professional, non-clinical skills	Awareness	▪ Create community awareness regarding the needs of CSDs. ▪ Discuss community awareness with other professionals (e.g. school nurses and teachers). ▪ Make primary caregivers and teachers aware of the importance of adequate, effective and appropriate communication skills.	▪ Increased awareness of CSDs at both personal and community levels. ▪ Increased community understanding of needs of CSDs and the importance of providing them with appropriate effective communication means ▪ Reduced stigmatisation in community.
	Information	▪ Provide information regarding CSDs. ▪ Provide information regarding expectations. ▪ Provide information regarding further communication needs (long-term plan).	▪ Demystify concept of CSDs. ▪ Empowerment of primary caregivers regarding their CSDs by providing information about expectations and realistic goals. Primary caregivers will also feel supported.
	Referral	▪ Initiate referrals to therapists ▪ Initiate referral for further medical management. ▪ Assist therapists and teachers (particularly school nurses) in determining when a medical referral is necessary.	▪ Increased understanding amongst professionals regarding the early referral and intervention of CSDs. ▪ Establishment of a clearer referral line that will not waste time, money and/or effort.
	Feedback	▪ Make caregivers aware of importance of providing feedback to referring nurse. ▪ Encourage other professionals to provide feedback to referring nurse. ▪ Provide feedback to caregiver regarding the changing communication skills after BCIP implementation.	▪ Encourage regular feedback from caregivers to monitor progress and meet changing needs and abilities of CSDs. ▪ Provide feedback to caregivers and other professionals. ▪ Feedback as reciprocal activity established.

	Follow-up	▪ Encourage caregivers to bring their children for regular follow-ups to monitor progress. ▪ Assist caregivers to monitor the quality and quantity of communication (use the progress chart).	▪ Regular follow-up visits. ▪ Caregivers become active observers of CSDs' progress. ▪ Increased motivation of caregivers as progress is noted.
Level 3 Cross-training of administrative skills	Prevention	▪ Educate the community on causes of disability and how some conditions can be averted and prevented, e.g. pre-natal care, good nutrition etc. ▪ Refer high-risk mothers. ▪ Educate on compliance with appointments (doctors, hospital, therapists, etc.), medication (e.g. epilepsy), periodic health visits (growth chart) and follow-up.	▪ Appropriate information and/or referral of mothers who are at risk of producing CSDs (e.g. women >38 years or teenage mothers) so that early and informed decisions regarding childbearing can be made. ▪ Lower incidence of disability. ▪ Decreased impact of the disability on the child's functioning.
Level 4 Cross- training of clinical disciplines	Identification and screening	▪ Identify children who are at risk of disability (e.g. twins, very low birth weight, poor nutrition, etc.) according to health history. ▪ Conduct health assessment on identified children (at-risk and established risk). ▪ Use "*Progress Checklist"* to obtain baseline data ▪ Assist in obtaining necessary medical evaluations.	▪ Obtaining relevant information about child in collaboration with caregiver to determine presence of disability so that child can be referred. ▪ Analyse and discuss results from progress checklist with the caregiver. ▪ Explore presence of risk factors further.

	Planning services	▪ Initiate and implement the beginning communication intervention protocol (BCIP) ▪ Suggest modifications to present communication means, functions and opportunities (using principles from the BCIP). ▪ Reassuring caregivers of humanity and likeability of CSDs. ▪ Encouraging caregivers of CSDs to start a support group while waiting at the clinics. ▪ Sustaining families through support and being an anchor (willing to listen and help).	▪ Early participation and communication which will enable the CSD to reach his/her full potential. ▪ Realistic goals and expectations will be set by caregivers. ▪ Caregivers will adopt a positive attitude towards disability. ▪ Guide caregivers to adapt their environment to provide optimal opportunities for interaction and learning. ▪ Train caregivers in the use of different communication means and functions. ▪ Sustain families by offering continued support and interest.

(Applied and modified, based on ASHA, 1996; Dublinske, 1983, Freeman & Heinrich, 1981; Mast 1983 and job descriptions for community health nurses provided by the Assistant Director of Health in the Moretele district).

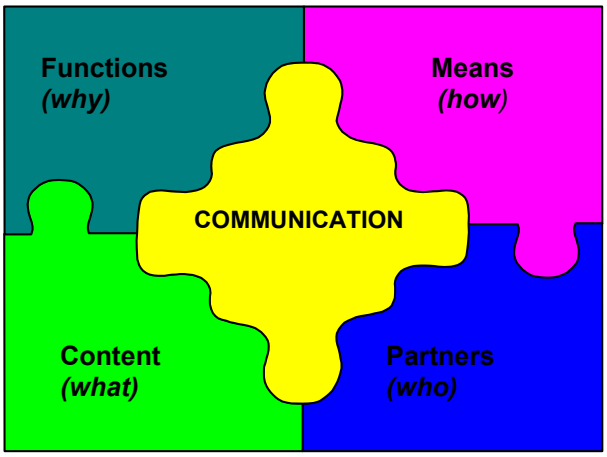
6 COMMUNICATION

6.1 What is communication?

Any act by which one person gives information to, or receives it from another person about that person's needs, desires, perceptions, knowledge or emotions. This can be done via gestural, signed, spoken, and/or written means. Communication is generally considered to be intentional and involves social interaction. The whole process is embedded in a specific context and environment (Beukelman & Mirenda, 1998; Johnson, Baumgart, Helmstetter & Curry, 1996; Zangari & Kangas, 1997).

From this definition four main areas arise

1) Communication functions **(why** the child communicates)
2) Communication means (**how** the child and others communicate)
3) Communication content (**what** the child and others communicate about – role of the environment)
4) Communication partners (**who** the child communicates with)



6.1 Main areas of communication

Each of the main areas will now be discussed in more detail.

6.1.1 Communication functions

Communication functions relate the **reasons for** communication. In the BCIP a few beginning communication functions will be addressed, namely:

- Making choices
- Naming / Labelling
- Requesting help
- Requesting more
- Getting or maintaining social attention: Draws attention to himself and signals his presence

- Protesting and the concept of "*no*"
- Confirmation and the concept of "*yes*"
- Showing surprise and humour.

Communication is powerful and efficient, with efficiency being reflected by the fact that a single message, e.g. "*more"* can function as a request in many different situations (e.g. *"I want more cookies"* ; *"I want more bubbles"* ; *"I want more play"*, etc. or can function as a comment (e.g. *"There are more cars."*). Likewise "*Mama*" can be used to gain attention, to request "more", to label or to protest. The first attempt at teaching beginning communication functions is the manipulation of certain aspects of the child's environment to make things more conducive to meaningful communication. Due to their skills (including communication skills) typically developing children are able to engage in interaction, take turns, make their intentions known and indicate pleasure or protest. On the other hand CSDs, and in particular those with little or no functional speech, (LNFS) have fewer opportunities to communicate than their speaking peers.

Individuals with severe disabilities are sometimes passive - they have limited skills, or few reasons to communicate and few opportunities for meaningful interaction, making active participation difficult. This might be due to the fact that adults typically provide CSDs and in particular those with LNFS, with fewer opportunities to communicate than is the case with their speaking peers (Zangari & Kangas, 1997). Some communication partners also have little or no expectations that, because of their limited abilities, children with LNFS can or will participate in interaction. In addition, the main focus is often exclusively on the caring and nurturing of these children. Consequently no demands are placed on them, resulting in a reduced number of opportunities in which they are required or tempted to communicate (Silverman, 1995).

As stated in the definition of CSDs, these children experience problems with both communicative interaction and active participation, e.g., if Wendy is passive in

interaction, does this mean that she is unable to participate, unable to request objects, food or things? Does the problem lie with Wendy, or does it lie with her environment that is unable to make the appropriate adaptations to accommodate her particular abilities? The answer to this question will depend on whether she is given an opportunity to request something, e.g. favourite toy.

Very often the environment needs to be only slightly adapted in order to provide CSDs with the necessary communication opportunities. How can this be done?

A number of different strategies can be used, called **communication temptations** or “sabotage”. There are different ways in which particular environments can be adapted or changed in order to provide deliberate opportunities for communication. This means that the environment has to be structured in such a manner as to deliberately provide opportunities (Westling & Fox, 2000).

The main aim of using communication temptations is to provide the CSD with more opportunities for interaction through deliberately creating opportunities for communication (Rowland & Schweigert, 1993). If no deliberate communication opportunities are created, two negative consequences follow. Firstly, the limited number of meaningful opportunities for interaction leaves the child with LNFS with very little motivation to develop more effective communication skills. If there is no reason to communicate, why work at better communication? Secondly, the number of communication opportunities children with LNFS need in order to practise their emerging communication skills are often limited (Blischak, Loncke & Waller, 1997). Children with LNFS should therefore not only acquire the desire to communicate, but also be provided opportunities to learn and practise new skills. This is necessary, as CSDs are often passive communicators who may respond to communication, but very rarely initiate interaction. Primary caregivers need to acquire skills to embed communication opportunities within the natural, functional activities of the child’s entire day.

When assessing the skills of typically developing children, it is not necessary to pay special attention to the creation of opportunities for communication. This is

because these children are able to interact independently, e.g. they will walk to the refrigerator and take out the milk. On the other hand, a child with a physical disability may not have the ability to go to the refrigerator independently, while a child with a severe intellectual impairment may not have the skills to know that the milk is kept in the refrigerator. Therefore, deliberate opportunities for interaction must be created in order to develop and expand these children's skills.

An environment that contains few objects of interest, few reinforcers, or that meets all the needs of the child without requiring language is not conducive to developing the child's communication skills. Research has indicated that a number of strategies can be used very effectively to create opportunities for communication (Bornman & Alant, 1999; Rowland & Schweigert, 1993). Strategies that can be used to teach a specific function will now be discussed in more detail.

a) Making choices and naming

Communication functions	Making choices Naming / Labelling
Communication opportunities	Providing opportunities for making choices

Choice-making implies that an individual must have at least two available alternatives, either of which would meet at least some of the individual's chosen goals (Rourke, 1998). In order to train a child to make a choice, it is necessary to teach him/her to discriminate between a choice of at least two options as opposed to merely recognising each choice, e.g. *"Do you want the soap or do you want the toothbrush?"* Using materials that consist of known *"likes*" versus "*neutrals*" or "*blanks*" can do this, e.g. if it is known that the child has a strong desire for "*Coca-Cola*" as opposed to a neutral feeling regarding water, these two options can be given. In the past a lot of emphasis was placed on providing choices between a known, e.g. "*Coca-Cola*" and a known dislike e.g. milk. However, too much inappropriate behaviour was noted when the child accidentally made the wrong choice, and therefore the known dislike was

changed to a neutral/blank. It is essential that the child be guided to develop preferences, as preferences can be seen as an essential component of choice-making.

Choice-making can be conducted in a variety of ways, but often when considering choice-making, offering a choice of materials is the only one that comes to mind e.g., *"Do you want Coca-Cola or do you want milk?"* or *"Do you want the soap or do you want the facecloth?"* However, choices could also be given regarding tasks e.g., *"Must we wash you face or brush your teeth?"* as well as between partners *"Must I help you, or can Ntebeng help you?"* For example, Cindy's primary caregivers could be encouraged to create opportunities for choice-making by asking her which dress she would like to wear. They should also be trained to wait expectantly before putting on the dress, as this will encourage Cindy to signal for the continuation of the activity.

Choices can also be presented on different levels, starting with the easiest choices and then moving to a more complex level. It is important to start with two options, using the real objects in the natural context. The child is then required to indicate his choice by pointing to the desired object or by reaching for it. It does not require a yes/no response from the child, nor does it require the labelling of the objects. On the next level, however, the same choices are provided, but now it is expected of the child to be able to give a yes/no response. On the last level multiple option choices are given where both yes/no responses and labelling responses are given. On this level, real objects are no longer used, but representational objects or symbols are used, e.g. empty packet of "*Simbas*" instead of real "*Simbas*" (Beukelman & Mirenda, 1998).

Providing CSDs with choices is something that should be consciously planned (Bornman, 1998). Primary caregivers of CSDs commented that, despite their children's disability they can also be fussy about what they would like to eat (e.g. Samuel does not like salty foods), what they would like to wear (e.g. Spice girl takkies!) or even what they would like to do (e.g. play with the water in the bath).

Opportunities for indicating preferences and making choices should therefore always be a high priority.

b) Requesting *"help"*

Communication function	Requesting help
Communication opportunities	Making desired items inaccessible Selecting materials that require assistance

Making desired items inaccessible

CSDs very often do not have opportunities to request things, which causes them to become passive partners in interaction (Blackstone, 1991). Speaking partners (peers and adults) tend to dominate communication and only occasionally provide opportunities for children with LNFS to respond. In addition, very few to no opportunities are provided for CSDs to initiate interaction. In order to address the importance of providing CSDs with the opportunity to initiate interaction, requesting skills should be taught. This can be achieved through deliberately creating opportunities for requesting. A very effective method of doing this is by occasionally making desired items inaccessible to the child. It is, however, important to note that the desired items should not be taken completely out of the child's sight, as they may forget what it was that they were looking for, or they may lose interest. This strategy should not be used too often, as the idea is not to frustrate the child, but to provide an opportunity to request something.

Desired items could be made inaccessible by putting them in see-through plastic containers that the child is unable to open independently, thus providing him with the opportunity to request help. Desired items could also be placed out of reach, so that the child has to request the item. This could mean that the spoon is placed out of reach, or that a favourite shirt is placed out of reach.

If the child does not request the desired item, a prompt must be used in an effort to elicit communication. Start with a verbal prompt ("*Tell me what you want*"), followed by a gestural prompt if there is no response (e.g. a puzzled look, or a

vague sweep of the hand over the communication board) and finally a physical prompt (forming the child's hand into the needed gesture, e.g. "*cookie*"). Remember to allow the child enough time to respond before a giving the prompt!

Requesting is a skill at which speaking children are very good. Think how easily they order us around with their voices **"***Give me the spoon, please", "I want some ice-cream"* etc.

Select materials that require assistance

A very important skill to teach a child is to request help. Think how often small children request help, e.g. by bringing their primary caregivers something that they cannot open themselves! CSDs on the other hand very often do not have the opportunity to develop these skills, as adults or peers tend to do everything for them! There is a general feeling that these children are already so disabled that life should not be made any more complicated for them! However, by doing so we are depriving CSDs of the opportunity to do things for themselves, fostering learned helplessness.

How can requesting help be taught? In order to create an opportunity for requesting assistance or "*help*", materials should be selected with care. Although it is of the utmost importance to create deliberate opportunities for requesting assistance, it is also important not to frustrate the child. The selected material should thus be of such motivational value that the child will request assistance, e.g. when making a sandwich, the bread can be placed in a plastic bag that the child cannot open independently, or a zip that the child cannot undo independently, or a Velcro shoe fastening, or even placing a fruit in a see-through container!

When the adult notices that the child is experiencing problems, and that the child is not requesting assistance, a prompt can be given, i.e. "*Must I help you*?" whilst the manual sign for "*help*" is also modelled. In this example a verbal as well as a visual prompt is given. If there is no response, a hand-over-hand prompt can be

given where the child's hands are moulded to form the manual sign for "*help*". Assistance is then provided. As the activity of making a sandwich continues, the margarine could be placed in a container that the child is unable to open independently. After pausing, observe the child before prompting. Prompts can gradually be faded until it would be sufficient to look at the child expectantly. In time the child should be able to request assistance without any prompts. Likewise, the jam or cheese, etc. could also be placed in containers that the child is unable to open independently.

As with requesting "*more*", requesting "*help*" is a very powerful interactional tool, as this request can be used across a number of activities.

c) Requesting "*more*"

Communication function	Requesting more
Communication opportunities	Providing small portions Providing brief turns

Providing small portions or brief turns

When using this strategy, the adult does not give the child all the necessary materials at the same time (e.g. give clothing pieces one by one - give only one sock, and wait for the child to request the other) or offer small portions (e.g. when feeding, give only one mouthful, and then wait for the child to signal that he wants more). This strategy is another way of facilitating requesting skills as it provides children with ample opportunity for requesting to enable them to continue the activity. Other examples would be to pour only a tiny amount of milk, e.g. one mouthful into the child's cup. Give it to the child and wait expectantly. Likewise, if a child is very fond of "*Jellytots*" or "*Smarties*", do not give him the whole packet, but give the sweets one at a time. It should be stressed, however, that this strategy should only be used with objects of high motivational value, otherwise there is no incentive for requesting.

Providing brief turns

When engaging in a particular activity the turns for participation could also be shortened, e.g., if a child is bouncing on the adult's lap and shows signs of enjoyment, bounce him once or twice, and then stop the activity and see if he will request "*more*". Remember that this need not be done verbally, but the child could also indicate/request "*more*" by using a body movement (e.g. showing a gross up and down movement of the body) or by using the manual sign or a symbol to request "*more*". This is a very powerful intervention strategy because teaching the child the manual sign or symbol for "*more*" opens up a great number of communication opportunities for him, as he is then able to request *"more"* of anything motivational in the environment.

d) Getting or maintaining social attention: Drawing attention to himself and signalling his presence

Communication function	Drawing attention to himself and signalling his presence
Communication opportunities	Deliberately withholding attention

Teaching children how to request attention from others appropriately can be a difficult task. Withholding attention can, however, be used as a very powerful strategy to elicit interaction, but should be used with caution. It requires the adult to occasionally withhold attention or interaction until the child attempts to gain attention. Think again of typically developing children. They have no problem in calling to get attention! And if they do not get a response immediately they make a fuss until they are taken notice of.

Although this strategy is highly effective with children with a strong desire to communicate, it is not effective with very passive children, as these children are happy to be left alone or ignored. If a child is strongly motivated to engage in interaction, attention can deliberately be withheld, e.g. while feeding the child pretend to ignore him by looking away. Specific times can also be selected for withholding attention, e.g. after lunch when everybody gets up to go and play,

you can "*forget*" to include him in the next activity and leave him at the cleared table until he does something to draw attention to himself. Of crucial importance, however, is to give the child your immediate attention at the slightest attempt from his side to indicate his presence. It is also important to equip the child with the necessary tools for calling attention, e.g. putting up his hand to call for attention, pressing a bell that rings to draw attention, or banging a spoon on the table for attention, etc.

e) Protesting and the concept of "*no*"

Communication function	Protesting Concept of "no"
Communication opportunities	Offering a non-preferred item Asking "yes/**no**" questions

Protesting is often one of the first communication functions that develops (Blischak *et al.,* 1997). Primary caregivers are always amazed to find that children at a very young age start showing preferences and start using the word "*No*!" CSDs often become very passive communication partners, as they often do not have the opportunity to indicate protest. Their diets and daily routines, for example, might be very strict, and therefore they are not allowed to indicate that they would not like to perform certain tasks, or eat certain food. Even if they do protest, these attempts are often ignored. This leads to these children not displaying protesting communication functions as frequently as their peer group. It is therefore important to deliberately create opportunities for these children to protest.

Offering a non-preferred item

A very effective strategy for doing this is by offering a non-preferred item, i.e. if you know that the child wants fruit, offer him porridge, or when bathing the child, instead of soap give him a spoon, or when feeding suddenly give him a comb and see if he will protest, or whether he will willingly accept the incorrect item. If no protest is noted the adult should intervene and say, "*No! This is the wrong*

one! You actually asked for fruit!" This strategy should, however, not be used if a child does not have good choice-making skills, as it will cause great confusion. When this strategy is introduced for the first time primary caregivers are often sceptical, as they fear major behavioural problems and temper tantrums. However, recent research with a group of autistic children showed the opposite to be the case (Bornman & Alant, 1999). The reactions of the children varied between total surprise ("*What is this adult up to*?") and vigorous head-shaking to indicate "*no*". During the whole course of the research project (almost three months) not one behavioural problem related to providing the incorrect item was noted.

Asking "yes/no" questions

If a child has strongly developed protesting skills, one can move to a more sophisticated level of protesting, namely indicating "*no*". Sometimes CSDs are not challenged and all questions have a "*yes*" answer. It is important to not fall into a predictable routine when using this strategy.

f) Confirmation and the concept "yes"

Communication functions	Confirmation Concept of "yes"
Communication opportunities	Asking "**yes**/no" questions

Last, but definitely not least, the primary caregiver can ask yes/no questions for the child to confirm or deny e.g. *"Must I wash you hair?"* The ability to answer yes/no questions is, contrary to popular belief, an advanced skill. When referring back to the different levels of choice-making, the ability to indicate yes/no to a question, is on the advanced levels. It is also important to realise that initially both concepts are not taught simultaneously, but that one firm response is expected. Primary caregivers should ask yes/no questions for the child to confirm or deny, e.g. "*Do you want to have a bath?*" These strategies should, however, not be done at the expense of all other strategies as they are more directive in nature

and do not allow for as many opportunities for interaction and initiating communication on the child's side.

Furthermore, when working with children with LNFS it is important to steer away from the use of rhetorical questions e.g., "*That's a new dress, isn't is*?" (Blischak *et al.*, 1997). This leads to confusion, as the children do not learn the concept of when they are expected to communicate and when not. It also contributes to feelings of isolation and frustration as these children are rarely engaged in interaction as active participants, as no response is expected from them when they are asked rhetorical questions.

g) Showing surprise and humour

Communication function	Showing surprise and humour
Communication opportunity	Violating expectations

This strategy can only be used once the child is already engaging in certain routines, e.g. bathtime and is effective in eliciting a protest or a surprise reaction from a child. CSDs often have set routines that are conducted daily in almost exactly the same way. The primary caregiver may set up a familiar routine, and then violate the child's expectations by substituting the wrong items part way through to elicit protests or comments e.g., when dressing the child put a sock on his hand or his pants on his head. If the child is able to dress himself, one item can be substituted for another to elicit a response e.g., if he is putting on his shoes, give him a facecloth. If the primary caregiver always puts out spoons before meals, she can pretend to "*forget*" to give the child his spoon. The primary caregiver can then respond by saying *"I'm silly! Look what I've done… uh oh this is not right!"* When using a highly familiar routine like bathtime at home, the activity can continue as usual, but the primary caregiver can "*forget*" to fill the bath. This is usually an activity that elicits a lot of fun for both participants. The adult has to constantly remain creative (do not always violate expectations in the same way, as the child might later see it as part of the routine). The child, on the other hand, is bound to show some reaction, maybe through a smile, a puzzled

frown, a natural gesture, a vocalisation, speech or laughter. For some children this may be the start of communication interaction, as they are actively responding, motivating the adult to explore even more avenues of interaction.

Conclusions on communication functions

Deliberately offering communication opportunities will enable CSDs to practise their communication skills (with regards to communication functions and means), optimising their interaction skills and learning experiences.

Care should however be taken to avoid "*communication temptations*" becoming *"communication frustrations"*. This will not happen if a primary caregiver is sensitive to the child and the way the child reacts to ensure that he does not get totally frustrated and angry because, e.g. he wants something to eat, but does not have the communication means to do so. In this case, the child needs to be taught how to request the food. The different communication means will be described later. The primary caregivers must also be careful not to miss or ignore the child's communication attempts because they do not realise that a particular behaviour was used to request the object!

Often, when a child is learning how to communicate or learning how to use a specific AAC system, it is appropriate for the primary caregiver to offer many deliberate cues as this offers many learning opportunities. But as the child's abilities improve, the primary caregiver may need to reduce the number of deliberate overt cues for communication in order to allow the interaction to become child-controlled instead of remaining adult-controlled. This is a very important element of communication for CSDs and in particular those with LNFS as they are often passive communicators who very rarely respond to communication. Primary caregivers thus have to learn the skills of how to embed communication opportunities within the natural, functional activities across the child's entire day.

6.2.2 Communication means

In the definition of communication that is used for the BCIP, it is stated that the communication message can be transmitted from one person to another via gestural, signed, spoken, and/or written means. The communication means most frequently used is spoken language (talking). It is known, however, that this may often be the most difficult form of communication for CSDs. This does not imply that these children should be excluded from communication, but rather that a means other than traditional drill work should be used to get them participating and communicating. They therefore need a crutch to lean on while spoken language is developing. This crutch is called Augmentative and Alternative Communication (AAC). Some CSDs will learn to speak without using their crutch, some will sometimes need their crutch in certain situations, whereas others will always be dependent on their crutch.

What exactly do we understand by the term Augmentative and Alternative Communication (AAC)?

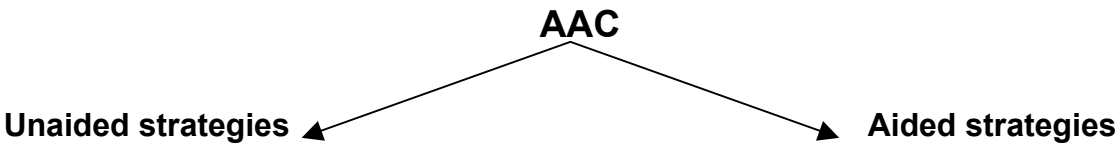
Augmentative and alternative communication (AAC) refers to the field or area of clinical/educational practice to improve the communication skills of individuals with little or no functional speech. It includes the supplementation or replacement of natural speech and/or writing, using aided and/or unaided symbols (Lloyd, Fuller & Arvidson, 1997).

The first important thing to note, is that **augmentative** communication is mentioned first, as this is the strategy that is used in the majority of cases. Most CSDs are able to produce a few vocalisations, and in some cases even a few words. For these individuals, AAC will never be used to replace the way they already communicate. Remember, a crutch is something we use to assist us, not something to replace what we already have! This means that if Thabang is able to communicate "*no*" by saying "*uh..uh..*" we will not attempt to modify this by giving him a symbol to say "*no*", as we can understand his message. So if some natural speech is present, we use the term a**ugmentative**.

A few individuals, however, require an **alternative** system. This means that the strategy used will be a substitute (or alternative to) the natural speech of the individual. This might be used in cases where a person has a very high neck lesion and is unable to produce any sounds, or if there is damage to the vocal cords and no sounds can be made. An alternative system is, however, the exception rather than the rule.

All AAC strategies fall into two broad categories, namely unaided and aided communication systems. **Unaided communication systems** will be discussed first.

Unaided communication: This refers to communication symbols, strategies or techniques that use only the body or parts of the body to represent, select or transmit information (Lloyd *et al*., 1997, p.543).



- **Gestures** (e.g. pointing, yes/no headshakes, facial expressions, mime and natural gestures)
- **Sign languages** (e.g. SASL and ASL)
- **Natural speech**

a) Gestures

This refers broadly to non-linguistic communication and includes pointing, yes/no headshakes, mime, facial expressions and natural gestures (Loncke & Bos 1997).

Pointing is a gesture that occurs early in a child's development and is considered an essential part of communication development. It is usually used as a direct way of indicating or requesting a desired item. Although pointing is usually done by using the hand, it can also be done through eye-pointing in cases where a child has a severe physical disability. The child will indicate the

choice by looking at the desired item. Pointing is a very powerful interaction tool as it requires very little motor ability, is generally understood by unfamiliar communication partners and can be used in combination with other aided and/or unaided symbols.

Yes/no headshakes are a form of unaided communication that is widely used by speaking and non-speaking persons alike. They are usually easily understood and are highly useful and effective when used in combination with other AAC means. Their efficiency is, however, dependent upon the questioning skills of the communication partner. Headshakes only provide the child with access to one communication function, namely responding, and are therefore limited if not used in combination with other AAC means.

Facial expressions convey a vast amount of information, particularly regarding emotions. A smile can show happiness, a frown can show that you don't understand. The face can also be used to show anger, unhappiness, discomfort, etc. Never underestimate the use of facial expressions! The facial expression should always be in accordance with the rest of the message, e.g. do not say "*No! Don't do that!"* with a big smile on you face! It will either have no effect or confuse the child.

Mime is a more elaborate form of gesturing as it includes the use of the whole body and not only the hands, arms and face. It attempts to convey information or ideas through pantomime or simulation of an activity (Musselwhite and St. Louis, 1988). Mime can be effectively used as an initial technique before moving towards the use of gestures and/or signs (Loncke & Bos, 1997). It can also be used as a back-up system in some situation (e.g. showing a dog barking). Mime, on its own, is limited as a primary communication means.

Natural gestures are gestures that are mostly made spontaneously and are usually understood by the general public without any prior training. These natural gestures are culturally specific, so if you are not part of the community they can easily be misinterpreted! They are relatively easy to make, and are used by many

individuals e.g., your hands could be used to indicate "*come here*" or "*go away*", or even to "*Watch it!*"

Sometimes natural gestures can take a slightly different form, and an object can be used for communication, e.g. Helen holds up her empty cup to indicate "*more juice*", whilst Thembi holds out her foot with a shoe on to request *"Take off my shoes".*

The major advantage of natural gestures is that non-disabled people also use them and many people understand them without needing any training. The movements usually require gross hand movements, and thus even children with a physical disability can usually form some gestures. Using and reinforcing natural gestures are usually good ways of introducing a person to the use of keyword signing (explained in detail in Section b). The greatest disadvantage is that they are very limited and do not allow for conveying more abstract or difficult messages.

b) Sign language (e.g. ASL or SASL)

Sign language is a complete language on its own, used exclusively by the Deaf. It has its own sentence structure, grammar and rules, exactly like any other language, e.g. Tswana, Afrikaans or Pedi. A particular sign language, e.g. South African Sign Language (SASL) consists of a great number of formal learned manual signs. The aim of intervention with CSDs is not to teach them Sign Language but to teach them **keyword signing**, using the manual signs from SASL. We will therefore use the sentence structure of the oral language that we use, e.g. Thuso will use manual signs together with Tswana, Pieter will use his manual signs together with Afrikaans, and Lerato will use her manual signs with Pedi! None of them will suddenly start using the sentence structure of SASL! It is also important to note that there are different kinds of sign language, e.g. the United States of America uses ASL (American Sign Language) whereas SASL (South African Sign Language) is used in South Africa.

The emphasis of this protocol is on **keyword signing** which implies that signs are used to supplement the most relevant content words in a sentence. Signs from SASL are combined with speech and produced in the mother tongue word order, e.g. English or Setswana. Keyword signing has been reported to be most useful with hearing CSDs with LNFS. As messages are presented both auditorally and visually, they offer a reduced vocabulary that aids children with intellectual disabilities in processing information and it slows down the rate of spoken communication (Beukelman & Mirenda, 1998; Loncke & Bos, 1997).

SASL was developed to help people convey more abstract and difficult messages. This means that one does not automatically know what a manual sign means, but if trained, it would be understood and remembered. For example, if you were requested to sign "*help*", how would you attempt it?

The SASL manual sign for "*help*" is not easy to guess. If, however, once trained and the sign is explained (i.e. the flat hand beneath the fist moves in a upwards direction to indicate *"I help you, because I lift up your burden")* it becomes clearer and easy to remember. This BCIP will explore all the vocabulary needed for three activities of daily living, namely eating, dressing and bathing in more detail.

c) Natural speech

Speech is obviously the most common form of communication. It is the easiest to produce, always accessible and usually understood by the majority of communication partners. It is therefore important to note that the introduction to

an AAC system does not imply that the development of natural speech does not remain a priority.

When working with CSDs it is very important not to stop talking! Remember that many CSDs can hear and that they need to get information from as many sources as possible to aid their learning. They not only have to see what you are talking about, but also hear what you are talking about and even physically experience it! As mentioned at the beginning of this section, facilitating speech is the main aim of communication intervention, but in addition, other methods are used to augment the speech, as it is known that speech production is sometimes very difficult for CSDs.

What are the **advantages** and **disadvantages** of unaided systems? Obviously any system has advantages and disadvantages. The most obvious advantage of unaided systems is the fact that the child does not have to carry anything around. The manual signs needed are always available, e.g. if you suddenly have to go to the bathroom, it is quicker to say by using a gesture than first having to take out a communication book, draw the listener's attention, and then select the correct symbol. By that time it might be too late! Unaided systems are also very effective for ambulatory CSDs as they do not have to carry additional communication displays, e.g. when Cindy is outside and she is thirsty and she wants to say "*Please give me something to drink*" the manual signs are readily available! To summarise, the biggest advantages of unaided systems are that they are portable (the body is used), always available, quick and easy to use… so that communication does not have to be a slow and laborious task.

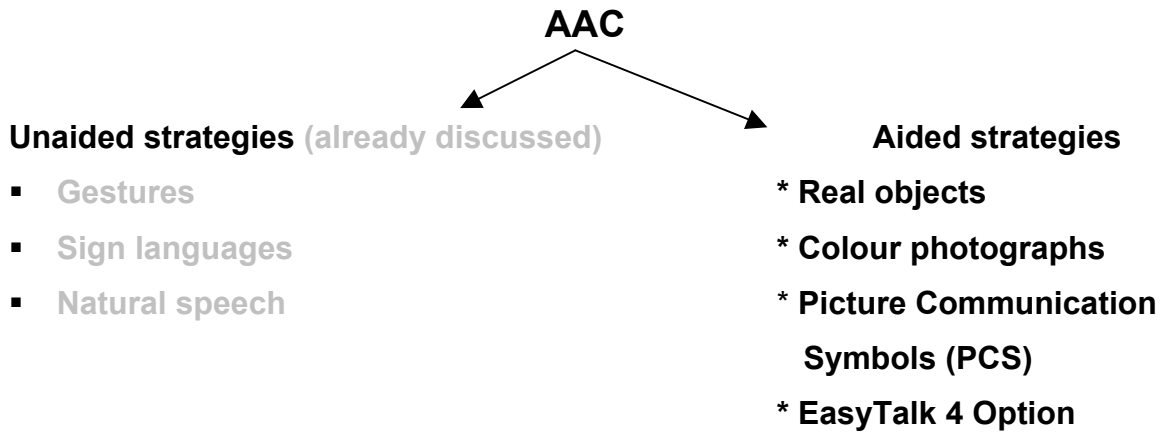
Regarding disadvantages, one the biggest problems with unaided systems is the fact that people who are unfamiliar with the system will not understand them, e.g. if you do not know the manual sign for *"black"*, you would not be able to guess it! Unaided systems thus do not facilitate interaction with unfamiliar partners. Secondly, the user needs adequate motor skills as manual signs are formed using hands and arms. Furthermore, manual signs are not displayed on a board from which the child only has to select one. This means that the child has to be

able to think of the manual sign and remember how to make it, if he wants to use it.

That completes the section on unaided systems. **Aided communication systems** will now be discussed.

Aided communication systems refer to communication that uses some type of external aid, symbol or assistive communication device (Lloyd *et al*., 1997, p523).

What all aided systems have in common is the fact that something additional is needed unlike unaided systems where the child needs only his own body. This would automatically highlight the main disadvantage of this type of system: the child has to take his aid or carry his device wherever he goes, e.g. Jennifer going to the beach, Zandile having to get into a taxi, Johnny wanting to take a bath, and Frankie playing outside.



Aided communication systems make use of symbols that are displayed either on communication boards or on communication devices. A symbol can be defined as something that is used to represent something else e.g. a spoon is used to represent mealtime. The way in which the different types of symbols are grouped in the above figure, shows broadly the hierarchy of difficulty, i.e. it is easier to understand the meaning of a real object than it is to understand a photograph (Beukelman & Mirenda, 1998). In teaching CSDs it is essential to start by using the easiest types of symbols while gradually moving to a more complex symbol.

A CSD can point to his plate to indicate that he wants to eat. Later a colour photograph can be used, followed by a line-drawing (e.g. Picture Communication Symbol) to indicate "*eat*".

a) Real objects

This is the easiest type of symbol to use for communication, and can be very effective for beginning communicators as well as for children with severe intellectual disabilities. The similarity of the thing the child wants (concrete referent), to the object is initially very important, e.g. at first the object-symbol for plate has to look exactly like the plate the child is used to otherwise he might not recognise it.

Real objects can be used most effectively when providing a child with choices. Two objects (that represent different activities) are presented to the child, and he is then asked to indicate a preference or make a choice, e.g. while holding out a spoon and a cup, the child is asked *"Do you want to drink your milk first, or eat you porridge first?*" The three dimensional nature of objects also makes them ideally suited for children with visual impairments as they can easily manipulate the objects (Musselwhite & St. Louis, 1988). Providing beginning communicators and/or children with severe intellectual disabilities with a means of communicating ensures future communication control and prevents learned helplessness. The use of object-symbols may serve as a useful introduction to AAC. The greatest disadvantage of using objects is their size. For some concepts (e.g. bed, bath, chair) the use of full size real objects will be impractical. To overcome this problem use may be made of a small piece of blanket, miniature soap, etc.

It is important to think of how these real objects will be presented to the child. They can be placed in a box with different compartments, stuck on a piece of cardboard, or fastened to a car-mat with Velcro. Durability is important and the display must be designed to minimise damage to objects and to reduce the loss of objects (Musselwhite & St. Louis, 1988). Furthermore if object displays are not

kept in the designated place where the activity will take place, it will not be used. It is important to realise that some children might need more than one object display, e.g. an object display depicting food, one depicting toys, one depicting favourite activities, etc. Flexibility of objects must be kept in mind; thus objects should not be permanently fixed, but rather attached with Prestik or Velcro so that they can be added or replaced quickly. Finally one of the biggest advantages of an object board is the fact that it is a static display that cues the child to start looking at all the possible choices and to scan through the choices in the same sequence (e.g. right to left or top to bottom).

b) Colour photographs

Colour photographs are more easily understood than line drawings (e.g. PCS), as they provide more clues, e.g. the *red* mug can easily be recognised, and the extent to which the foreground stands out from the background (Beukelman & Mirenda, 1998). An advantage of photographs over real objects is the fact that they are smaller, making it easier to display them, to expand the system and to portability. The greatest concern in the use of photographs is the fact that they are limited in terms of the ideas that can be expressed as they mostly focus only on nouns and verbs (Fuller, Lloyd & Stratton, 1997).

Photographs, especially those that are highly representative of the referent are often viewed as an intermediate step between real objects and more abstract line-drawings (e.g. PCS) (Musselwhite & St. Louis, 1988). Pairing is important when attempting to teach a child to generalise from objects to photographs. Start with a previously learned object together with the photographs and gradually fade the real object.

c) Picture Communication Symbols (PCS)

Picture Communication Symbols (PCS) consist of some 3,000 black and white line drawings that cover a range of different categories, e.g. nouns, verbs, descriptives, prepositions, etc. Phrases used in typical communication, e.g. ("*uh-*

uh!" "*my turn*") are also included. The advantages of using PCS are that they are relatively easily learned by CSDs, they are appropriate for all age levels, simple drawings for visual clarity, easy to reproduce and plenty of teaching materials for using PCS is available.

PCS are used extensively in schools in South Africa and children will benefit greatly if they are exposed to these symbols before they enter school. Teachers can then spend time teaching more complex concepts as they will not need to spend time on basic ADL activities. The use of PCS not only stimulates CSDs' receptive language, but it also provides CSDs with LNFS with an expressive means of communication as they can *"tell"* certain things by pointing at the symbols.

PCS can be displayed either on communication boards, or on communication devices (e.g. EasyTalk). For the purpose of the BCIP, the PCS that are used will be presented in activity-based format. This means that the whole vocabulary for a specific activity is presented together. Activity-based boards for three ADLs, namely eating, dressing and bathing, developed by Goossens', Sapp-Crain & Elder (1994) are used as a basis and slightly adapted for the South African context. The selection of these three activities will be discussed in more detail later.

Some of the important elements of these boards are the fact that initially a total of 16 messages are depicted on the board, but that templating can be used to minimise the number of options in order to accommodate the ability of the particular child. Colour coding of word categories is used (e.g. nouns are yellow) in order to facilitate word recognition. Commonly used words (e.g. "*oh oh*", "*I*" etc.) are always placed in the same position on the board in order to facilitate quicker retrieval of messages (Goossens', Sapp-Crain & Elder, 1994).

d) EasyTalk 4 Option

As well as using the communication boards as discussed, the symbols can also be displayed on voice output devices. There are a variety of voice output devices available, ranging from very low to very high technology. The BCIP uses a digital speaker, namely the "EasyTalk 4 Option".

Voice output devices have numerous advantages, e.g. intelligibility of communication is improved (unfamiliar partners are more likely to understand voice output than gestures or symbol systems), the speed and accessibility of communication is increased and there are more possible communication partners (Beukelman & Mirenda, 1998). Kannenberg, Marquardt & Larson (1988) also state that voice output devices provide greater communication independence, as the non-speaking person is able to use his own *"voice"* to communicate, rather than having to rely on gestures, pointing and symbols on communication boards or books. This leads to these people experiencing themselves as *"speaking"*. It has also been noted that users of voice output devices display better communication effectiveness, they initiate interaction more often, use more complex sentence structures and generally have more control during communication (Smith, 1994).

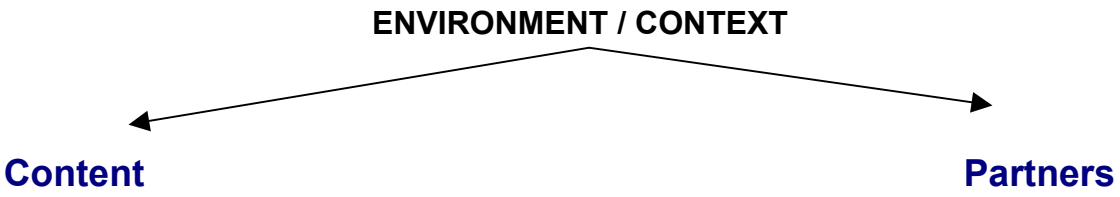
The two voice output devices generally used in the AAC field are digital speech (where speech is produced when the human voice is recorded and digitised) and synthetic speech (where speech is artificially produced by electronic means rather than by the human voice) (Quist & Lloyd, 1997). For the purpose of the BCIP emphasis will be placed only on digital speech, as a digital voice output device, namely the EasyTalk 4 Option is used. This device has been selected as it can be age, gender and language appropriate as speech is recorded, making it ideally suited to the multi-lingual South African context. Research has also shown that attitudes towards AAC users are more positive when the voice output is natural and easy to listen to (Gorenflo, Gorenflo & Santer, 1994).

When implementing the EasyTalk 4 Option, four different symbols for that particular activity will be selected and placed on the device. The child can then press on the photograph or PCS to activate the device and "*speak*" the message. Before using a voice output device, it is crucial that the child understands the meaning of the photographs/PCS that are placed on the device. If not, the device will not be used because the child does not understand the message, not because of lack of motivation to use the device.

6.2.3 Communication context / environment

The third communication aspect that needs to be addressed is that of communication environment. As previously mentioned, the communication context or environment refers to **where** the communication takes place. In order to interpret the meaning of a message, the context must be known. Context refers to where the child is, what the child is doing, whom the child is talking to, how he or she said something and what the partners had said, e.g. if the child says "*Daddy ball*" it can mean "*This is Daddy's ball*", "*Daddy get the ball"* or "*Daddy throw the ball*". The context determines how this simple message will be interpreted.

Research has indicated that training of CSDs should be conducted in relevant and meaningful contexts (milieu teaching)(Blischak *et al.,* 1997). Teaching in the natural context thus allows the primary caregiver to take advantage of cues and consequences that are natural parts of the setting. In some situations the first step in teaching a CSD to actively participate and communicate, includes the manipulation of certain aspects in his environment to make those settings more conducive to meaningful communication (Beukelman & Mirenda, 1992). From this communication environment two things thus arise:



6.2.3.1 Content

Content refers to **what** the child wants to communicate about. For the purpose of the BCIP, an ecological communication approach will be used as it is developmentally sound and clinically useful when dealing with CSDs (MacDonald, 1983). This approach states that for language to improve, major changes must occur in the child's communication, in communication of the partners and in the interactions between them. Secondly it states that language begins during the sensori-motor play activities and joint activities with others.

As play is the occupation of children, it is described as an excellent opportunity for discovering and learning new skills. During the early years of development play between an adult and a child is of particular importance, as this provides the content of learning experiences (Haring, 1993). Through joint play routines children observe adults and explore the world around them. However, during focus group discussions with primary caregivers in the Hammanskraal area, it was noted that primary caregivers do not regard play between a primary caregiver and child as culturally appropriate. Primary caregivers report that they do not generally play with their children but that a great deal of interaction occurs during activities of daily living (ADLs). As the aim of this protocol is to enhance participation and communication, three ADLs were selected, namely mealtime, bath/wash time and dressing/undressing. During these activities primary caregivers (caregivers) naturally interact with their children, which implies that in terms of intervention it is not something additional that they will have to do. These activities provide opportunities for joint attention and meaningful interaction between primary caregivers and children (McCormick & Schiefelbusch, 1984). The vocabulary used in these three ADLs also remains fairly consistent, providing opportunities for repetition and establishment of functional concepts.

On the downside it must be noted that the expansion of the vocabulary is limited when using ADLs. In addition, ADLs are activity-driven, i.e. they each have a set goal, and the primary caregivers try to achieve that goal, usually in the shortest time. Furthermore, ADLs have a fixed pattern, which is often difficult to change.

One of the biggest problems with CSDs is the selection of appropriate vocabulary in order to provide them with the necessary content to communicate a particular message.

Aided language stimulation (ALS) through the use of activity-based communication boards was designed specifically for CSDs and is based on milieu teaching (Goossens' *et al.*, 1994). The purpose is to provide the CSD with models for combining symbols in a flexible manner, and opportunities to do so. They are based on the premise that observing adults using the symbols extensively in natural interactions, the CSD will begin to establish a cognitive template of how to combine symbols to generate new messages (Beukelman & Mirenda, 1998). These activity-based boards are thus used in a very natural way.

ALS implies that the primary caregiver will highlight symbols on the child's communication board as she verbally interacts with the child during the activity, e.g. during mealtime the primary caregiver will say "*Uh oh! Look how dirty your face is! It is full of food*" while pointing to the symbols UH OH, DIRTY and FOOD. This means that the primary caregiver must know the symbols and have access to them. As discussed earlier, the primary caregiver should also provide numerous opportunities for interaction while conducting the activity.

According to Blischak *et al.* (1997) ALS serves at least three purposes: (1) it provides the user with a model of how the system must be used, (2) it allows the child to see the symbols used in everyday situations and (3) it suggests that the AAC system is an acceptable means of communication.

How can the three ADLs that provide the **content** for the participation and communication (what is communicated) be integrated with the communication

contexts (where communication takes place) and the **means** (how communication takes place).

Content : Mealtime		
Context: **Providing opportunities**	**Communication modes:** **Objects & symbols**	**Procedure**
1. Providing choices of ▪ Materials ▪ Tasks ▪ Partners ***This teaches the child labels & choice-making***	**Objects:** Spoon, plate, cup, food **Pictures:** Spoon, plate, cup, **Signs:** Milk, porridge, mother, I, grandmother, eat, drink **PCS Communication board** **EasyTalk 4 Option**	▪ Before starting to feed, ask the child "*Do you want your porridge or your milk?"* Hold up both options so that child can see. Emphasise the particular one by holding it slightly more to the front.(material) ▪ Ask: *"Do you want to eat or do you want to drink?"* (task) ▪ Ask: *"Must I help you or must Koko help you?"* (partner)
2. Making desired items inaccessible ***This teaches the concept of requesting "help"***	**Object**: Cup **Pictures:** Cup, help, want **Signs:** Cup, want, help **PCS Communication board** **EasyTalk 4 Option**	▪ Place food in see-through container that the child cannot open independently. ▪ Place cup on top of cupboard (out of reach but in sight) ▪ Place food out of reach.
3. Providing small portions / brief turns ***This teaches the concept of requesting "more".***	**Objects**: Cup, spoon, plate **Pictures:** Cup, spoon, plate **Signs:** More, want, help, eat, drink **PCS Communication board** **EasyTalk 4 Option**	▪ Pour only one mouthful of water into the child's cup ▪ Feed one mouthful, and take plate away. If child feeds himself, follow same procedure.
4. Selecting materials that require assistance ***This teaches the concept of requesting "help"***	**Objects**: Cup, jug, mango **Pictures:** Cup **Signs:** Cup, jug, want, help, drink, **PCS Communication board** **EasyTalk 4 Option**	▪ Put water in jug that closes very tightly, so that child has to ask for assistance. ▪ Close tap tightly, so that child cannot open it independently. ▪ Put a fruit in a see-through container that the child cannot open independently.
5. Withholding attention ***This teaches the child to draw attention to himself and to signal his presence.***	**Objects**: Cup, jug, mango **Pictures:** Cup, mango **Signs:** Cup, jug, want, help, drink, **PCS Communication board** **EasyTalk 4 Option**	▪ When setting the table, or when giving food to the siblings, pretend to '*forget*" the CSD. When he signals his presence, immediately react, and say *"I'm sorry! I forgot about you! I'm silly"*
6. Offering non-preferred items ***This teaches protesting and the concept of "no".***	**Objects**: Water, mango, lemon **Pictures:** Mango, lemon **Signs:** Like, yuck, no **PCS Communication board** **EasyTalk 4 Option**	▪ If you know that the child wants a mango, give him a lemon instead and see if he will reject it. ▪ If child wants milk, give water. ▪ If child wants to eat, first give a drink.
7. Violating expectations ***This teaches protesting as well as surprise and humour.***	**Objects**: Cup, spoon, plate **Pictures:** Cup, spoon, plate **Signs:** No, funny, mine **PCS Communication board** **EasyTalk 4 Option**	▪ When feeding the child, do something totally unexpected like eating a mouthful yourself! ▪ When feeding the child, hold the spoon the wrong way round or upside down. ▪ Instead of giving the child something to eat, give him something else, e.g. a stone

8. Asking yes/no questions ***This teaches the child to confirm or negate information***	**Objects**: Cup, spoon, food **Pictures:** Cup, spoon **Signs:** Head-nodding/head-shaking **PCS Communication board** **EasyTalk 4 Option**	Ask questions such as ▪ Do you want milk? ▪ Do you want some chicken? ▪ Do you want something to drink? ▪ Are you hungry? ▪ Do you like pumpkin?
Content : Baththime		
Context: **Providing opportunities**	**Communication modes:** **Objects & symbols**	**Procedure**
1. Providing choices of ▪ Materials ▪ Tasks ▪ Partners ***This teaches the child labels & choice-making***	**Objects**: Soap, water, sponge, towel, toothbrush **Pictures:** Soap, sponge **Signs:** Wash, pointing, dry **PCS Communication board** **EasyTalk 4 Option**	Hold out the soap and the sponge and ask, *"What do you want? Do you want the soap, or do you want the sponge?"*(Materials) Ask the child *"What must I wash? First you face or first your hands?"* (task) Ask the child: "*Must we first have a bath, or first brush teeth?"* (task) Ask the child *"Who can bath with you? Lesego or Mpumi?"* (partner)
2. Making desired items inaccessible ***This teaches the concept of requesting "help"***	**Object**s Soap, sponge **Pictures:** Soap sponge **Signs:** Want, help, wash, soap, water **PCS Communication board** **EasyTalk 4 Option**	▪ Place sink tub out of the child's reach (if he enjoys bathing). ▪ Place sponge out of reach. ▪ Place soap in plastic bag that the child cannot open independently. ▪ Place anything that the child plays with in the bath in a container that he can't open.
3. Providing small portions / brief turns ***This teaches the concept of requesting "more".***	**Objects**: Soap, sponge **Pictures:** Soap, arm, hands, face, foot **Signs:** More, wash, nice, point to different body parts. **PCS Communication board** **EasyTalk 4 Option**	▪ When bathing the child make foam with the soap on the sponge, and then only wash one body part at a time. Name the body part that you are currently washing. ▪ Stop, ask the child "*Do you want more?" Yes, more wash. Let's wash your other leg.*" ▪ Proceed with all body parts in the same way.
4. Selecting materials that require assistance ***This teaches the concept of requesting "help"***	**Objects** Tap, shampoo bottle, soap, toothpaste **Pictures:** Soap, shampoo **Signs:** Want, help, open, nice, look! **PCS Communication board** **EasyTalk 4 Option**	▪ Close the tap very tightly. Ask the child to run the water. ▪ Put soap in a see-through container that the child cannot open independently. ▪ Use an empty shampoo bottle that he can play with and close the lid very tightly. ▪ Close lid of toothpaste very tightly
5. Withholding attention ***This teaches the child to draw attention to himself and to signal his presence.***	**Objects**: Towel, soap **Pictures:** Soap **Signs:** Want, help, dry, putting up his hand **PCS Communication board** **EasyTalk 4 Option**	▪ This is not a strategy that is recommended during the bathtime routine, as it has certain safety implications. ▪ It can, however, be used when the child is washing his hands before lunch. Pretend not to notice him and do not offer him a towel to dry his hands.
6. Offering non-preferred items ***This teaches protesting and the concept of "no".***	**Objects**: Shampoo bottle, sponge, towel **Pictures:** Sponge, soap **Signs:** Want, help, no, wash, dry, head-shaking **PCS Communication board** **EasyTalk 4 Option**	▪ During bath time this activity is usually done by giving the child a bath toy (e.g. shampoo bottle, etc.) that he doesn't like. ▪ When the child has to get out of the bath and it is time to dry himself, don't give him the towel, but give him a sponge and say "*Yes, It's time to dry yourself*".

7. Violating expectations ***This teaches protesting as well as surprise and humour.***	**Objects**: Soap, bath, sponge **Pictures:** Soap, sponge **Signs:** Want, help, wash, funny, no, like, don't like **PCS Communication board** **EasyTalk 4 Option**	Do something totally out of routine, e.g. ▪ Put the child in the bath without water and say "*We are going to have a bath now!*" ▪ Put the child in the bath with all his clothes on, and see if you get a reaction ▪ Put the sponge under his armpit ▪ Put the soap on his head - pretend not to see
8. Asking yes/no questions ***This teaches the child to confirm or negate information***	**Objects**: Water, sponge **Pictures:** Sponge, spoon **Signs:** Head-nodding/ head-shaking **PCS Communication board** **EasyTalk 4 Option**	Ask a number of questions to which the child can indicate a yes or a no, e.g. ▪ Must I wash your face? ▪ Are we going to wash your hair? ▪ Have you finished? ▪ Do you want some more?
Content : Dressing & Undressing		
Context: **Providing opportunities**	**Communication modes:** **Objects & symbols**	**Procedure**
1. Providing choices of ▪ Materials ▪ Tasks ▪ Partners ***This teaches the child labels & choices-making***	**Objects**: Pants, shirt, cap, socks **Pictures:** Cap, socks, shoes **Signs:** Want, dress, shoe, shirt, pants **PCS Communication board** **EasyTalk 4 Option**	▪ Give the child a choice of what he wants to wear, e.g. *"Do you want your red T-shirt or do you want your striped T-shirt?*" (materials) ▪ Give the child a choice of what to do first, e.g. *"Must we first take off your shirt or first take off your pants?"* (task) ▪ Give the child a choice of who must help him, e.g. *"Must I help you or must Pauline help you?"* (partner)
2. Making desired items inaccessible ***This teaches the concept of requesting "help"***	**Objects**: Socks, shoes, hanger, plastic bag, shirt **Pictures:** Socks, shoes, shirt **Signs:** Help, want, give, dress, sock, shoe, shirt **PCS Communication board** **EasyTalk 4 Option**	▪ Put his favourite clothes on a shelf out of reach. ▪ Put his shoes in a plastic bag that he cannot open independently. ▪ Hang clothes on a hanger over the door where he cannot reach. ▪ Knot two socks together so that he is unable to untie them.
3. Providing small portions / brief turns ***This teaches the concept of "more".***	**Objects**: Socks, shoe, pants, shirt **Pictures:** Socks, shoe, cap **Signs:** More, on, in, shoe, shirt, give **PCS Communication board** **EasyTalk 4 Option**	▪ When putting on the child's shirt, put only one arm through the armhole and wait so that he can indicate *"more"*. ▪ Put on only one sock and pretend you have finished. ▪ Put on only one shoe. ▪ Pull on only one leg of the pants.
4. Selecting materials that require assistance ***This teaches the concept of requesting "help"***	**Objects**: Shirt, pants, shoe **Pictures:** Shoes, socks **Signs:** Help, you, shoe, close, difficult **PCS Communication board** **EasyTalk 4 Option**	▪ Do not automatically start fastening the buttons of the shirt; give the child the opportunity to request assistance. ▪ Do not close the zip directly, but draw the child's attention by saying "*Yes, fasten your zip"* ▪ Ask the child to buckle/unbuckle his own shoes.
5. Withholding attention ***This teaches the child to draw attention to himself and to signal his presence.***	**Objects**: Shirt, dress **Pictures:** Shirt, dress **Signs:** Help, dress, put on, take off, difficult **PCS Communication board** **EasyTalk 4 Option**	▪ While child is undressing himself, help him to pull the shirt over his head, but do not pull it off completely. Pretend to ignore him and start picking up the other clothes. ▪ After undressing the child, start doing something else and pretend not to notice him

6. Offering non-preferred items ***This teaches protesting and the concept of "no".***	**Objects**: Shirt, spoon, cap, pants **Pictures:** Shirt, cap, pants **Signs:** Head-shaking, give, help, want **PCS Communication board** **EasyTalk 4 Option**	▪ While dressing the child, give a totally incorrect item. Say "*Put on your shirt*" but give him a spoon. ▪ If the child selected his red T-shirt, deliberately give him the striped one. ▪ If the child wants to put pants on first, give him his cap.
7. Violating expectations ***This teaches protesting as well as surprise and humour.***	**Objects**: Socks, pants, shirt, shoe **Pictures:** Sock, pants, shirt **Signs:** No, funny, give, mine, finished **PCS Communication board** **EasyTalk 4 Option**	▪ After undressing, give the child the "dirty" clothes again to put on. ▪ Put a sock on the child's hand. ▪ Pull the pants over the child's head. ▪ Try to put his shirt on yourself. ▪ Put his shoe on your head. ▪ Give him your shoe to put on
8. Asking yes/no questions ***This teaches the child to confirm of negate information***	**Object**: Shoes, dress, jersey **Pictures:** Shoes, dress, jersey **Signs:** Head-shaking / head-nodding **PCS Communication board** **EasyTalk 4 Option**	Ask a number of questions to which the child can respond with a yes/no response: ▪ Do you want to wear shoes? ▪ Are you cold? ▪ Do you want your aeroplane shirt? ▪ Do you want to wear a dress today?

Conclusions about the communication content

According to MacDonald (1983) a few strategies are important when addressing the content of the interaction. In order to provide stimulating content, social contact is necessary, i.e. you need somebody with whom to communicate. That is why all three the activities discussed above involve the child and at least one other person (usually the caregiver). It is also important to provide opportunities for the child and to be in the child's world. This highlights a number of proximity issues, namely the importance of being on the child's level (be on the same level of eye contact and do not "talk down" to the child). It is also important to imitate the child, as this is the way in which he learns to imitate the adult. If the child puts a sock on his head, put the other sock on your own head. Apart from providing a rich opportunity for interaction, it is also great fun!

"*Salt 'n Pepper*" contacts (interaction opportunities spread throughout the day that provide frequent, natural opportunities for interaction work best. (Beukelman & Mirenda, 1998). This is why these three ADLs were selected: mealtime happens at least three times a day, the child dresses and undresses at least

twice a day, and there are frequent opportunities to wash face and hands throughout the day. These are thus activities that occur frequently.

6.2.3.2 Communication partners

This relates to **whom** the child communicates with. The communication partner is a vital part of the interaction process, because if you have something to say (content), you have the ability to say it, e.g. you know the manual sign for "*hello*", but there is nobody to say it to, it all becomes futile. Communication partners, e.g. caregivers, siblings and peers also need to be taught how to communicate with the CSDs and what to expect of them in interaction. Partners should be taught to look for communication means that might not be very obvious, They also need to be aware of the different communication functions, e.g. the CSD is requesting *"more*" or requesting "*help*".

Literature indicates that communication partners rate CSDs as competent communicators if they are able to do the following:

(1) Portray a positive self-image to their partners (this can only be accomplished if the CSDs have a sense of self-esteem and they feel that they are also able to do something and can contribute to the interaction).

(2) Show an interest in others and draw others into interaction. This implies that CSDs have the ability to ask questions, to convey compliments, etc. Although this is a very important aspect, it will not be addressed as such in the BCIP due to the specific activity-based nature of the communication content.

(3) Actively participate and take turns during interaction. This aspect is highlighted in the BCIP as the CSDs will have ample opportunities to engage in turn-taking activities. The deliberate provision of communication opportunities is an attempt to facilitate turn-taking

(4) Put their partners at ease, e.g. by commenting. Although this aspect will not receive direct attention in the BCIP, is expected to be a spin-off due to the particular method of training that is used. (Blischak *et al*., 1997).

Providing CSDs with communication opportunities directly relates to the partners' perceptions of the children's ability to respond appropriately (Blischak *et al.*, 1997). Therefore, intervention that fails to examine and address the role of the partners' expectations has limited benefit for potential CSDs. Any intervention programme should therefore involve the raising of the partners' levels of awareness and by teaching them to expect the CSDs who use an AAC system to play an active role in interaction.

7 GENERAL INTERVENTION PRINCIPLES

1. The intervention process should enhance participation in current and future integrated environments (Blischak *et al*., 1997). Beukelman & Mirenda (1998) also stress that interventions should be relevant for both short- and long-term development ("*for today and tomorrow"*). This implies that the skills that the CSD learns should also be applicable once he enters school, and when he is interacting with people outside the immediate family. The critical communication messages that the child is taught during ADLs should also be applicable to other activities, e.g. if the child is taught to request help when dressing, he can also request help when he is at school and, for example, he is unable to open the paint.

2. The role of interaction is not only to facilitate interaction between the primary caregiver and the CSD, but also to generally increase social interaction (especially with peers and siblings). In the past this factor was overlooked, but as educational inclusion and social inclusion (integration into community activities) become more of a reality for CSDs, it is receiving more and more attention.

3. The skills taught to the CSDs should be essential components of further development. The cognitive skills that develop with the communication skills (e.g. object permanence) is a good example of this. Increasing a child's communication skills will lead to an increase of learning abilities once he

enters school. Literature has indicated that the first five years of a child's life is the critical period for learning, and this period has to be utilised to its full extent. Currently teachers are spending a lot of time teaching CSDs basic ADL skills and recognition of body parts – functions that could have been acquired in the pre-school years had the primary caregivers known how to facilitate them.

4. It is important that the development of functional communication should be a priority for the CSD and for the family. Although ADLs as such might not be highly motivational for CSDs, they might find the interactional component very enjoyable – this is the time when they have one-on-one interaction with their primary caregivers. During discussions with primary caregivers it was noted that they found ADLs very important in their daily routine, due to the high frequency. Their aim is to help their children to become as independent as possible in the pre-school years.

5. One of the golden rules of interaction with CSDs is a give-and-take balance. Primary caregivers should be cautious to not always give, give, and give. They have to be taught to **wait** for a response. This is one of the most difficult skills to acquire, as we become anxious if there is a silent period and try to fill it by talking. It is necessary to wait for at least 15 seconds, and when a child is busy discovering a new activity, the partner may have to wait for between 1 – 3 minutes. This is not a passive waiting period where the partner can do other things, but an active waiting period where she looks at the child and tries to understand what he wants to tell her! Waiting and observing are two sides of the same coin.

6. It is also important to actively facilitate conversational skills by keeping the interaction going. This can be done by chaining things together, e.g. *"Yes, that is your sponge. We wash your tummy with your sponge. This tummy is full!"* However, it is important to keep a balance and not to dominate the interaction – expect a response from the child! If the partner keeps on talking

and does not wait expectantly for a response the child will never learn to become an active communication partner taking turns during communication.

8 MONITORING PROGRESS

8.1 Why is it important to monitor progress?

Service provision to CSDs is an on-going process, and monitoring progress is part of it. This is largely due to the fact that CSDs' needs and abilities change over time, requiring adaptations to the intervention plan. Being able to monitor progress assists in the planning of new objectives and the setting of new goals. It is also a method of evaluating the effectiveness of the service provision heightening accountability. Finally, service providers (the nurse and caregivers in the case of the BCIP) gain self-confidence in performing their tasks if progress is seen.

Progress checklist

Name of child_____ Name of person completing the form_____

Age_____ Date _____

A THE CHILD

A-1 Which ways of communication did the child use? (communication means)

Does the child use **pointing** to communicate?

1 2 3 4

Does the child use **objects** to communicate?

1 2 3 4

Does the child use **crying** to communicate?

1 2 3 4

Does the child use **facial expressions** to communicate?

1 2 3 4

Does the child use **manual signs** to communicate?

1 2 3 4

Does the child use **photographs** to communicate?

1 2 3 4

Does the child use **line-drawings** (symbols) to communicate?

1 2 3 4

Does the child use the **EasyTalk** to communicate?

1 2 3 4

Does the child use **vocalisations** to communicate?

1 2 3 4

Does the child use **speech** to communicate?

1 2 3 4

A-2 Why does this child communicate? (communication functions)

How well does the child **request help**?

1 2 3 4

How well does the child **request objects**?

1 2 3 4

How well does the child **request "more"**?

1 2 3 4

How well does the child **protest**?

1 2 3 4

How well does the child **confirm?**

1 2 3 4

How well does the child **draw attention** to himself?

1 2 3 4

How well does the child **label (name)** things?

1 2 3 4

How well does the child **make choices**?

1 2 3 4

How well does the child **indicate humour / teasing,** etc.?

1 2 3 4

B COMMUNICATION PARTNERS & ENVIRONMENT

B-1 How does the child communicate with people in the environment?

How frequently does the child communicate with **caregivers** / people in the house?

1 2 3 4

How frequently does the child communicate with siblings and other **children**?

1 2 3 4

How frequently does the child communicate with **unfamiliar adults** (strangers?)

1 2 3 4

B-2 Daily living information about the child

How **aware** is the child of the environment (interest in environment)?

1 2 3 4

How much **enjoyment** is seen?

1 2 3 4

How **active** is the child in interaction?

1 2 3 4

How **independent** is the child during ADLs?

1 2 3 4

C NURSE'S OBSERVATION : Which strategies should I encourage the primary caregiver to use with her child?

Providing opportunities for **choice-making**

Low priority Medium priority High priority

Providing **small portions** of materials or **brief turns**

Low priority Medium priority High priority

Making desired items **inaccessible**

Low priority Medium priority High priority

Selecting materials that require **assistance**

Low priority Medium priority High priority

Withholding **attention**

Low priority Medium priority High priority

Offering a **non-preferred** item

Low priority Medium priority High priority

Violating expectations

Low priority Medium priority High priority

Asking **yes/no** questions

Low priority Medium priority High priority

D. RECOMMENDATIONS

_____

_____

_____

CODES

No	Description
1	No evidence at all.
2	Emergent use. (Skill is starting to develop, but it is not clear and inconsistent).
3	Correct use, but with low frequency.
4	Uses correctly when needed.

CASE STUDY / VIGNETTE

Busi is a four-year-old girl brought to you by her mother. Her mother has noticed that she is reaching milestones at a slower rate than her brother who is two years younger. Her mother says that the brother is able to do things that Busi is still unable to do. Busi is the middle one of three children who live in an informal settlement in Hammanskraal. Her mother is not working, as she has to look after Busi. The father is a taxi-driver. Busi's mother feels that they are stigmatised due to Busi's disability. There is no family history of disability. At present Busi spends most of the day outside watching the other children play. The mother also has problems in dressing and feeding Busi as she is always on the move and becomes agitated easily. She mostly communicates using facial expressions, and makes sounds. She pushes things away when she does not want them.

Answer the following questions

1. Current abilities

1.1 Which different ways of communication does Busi use at present? *(communication means)*

1.2 What does Busi try to say with the things she does? (e.g. Which reasons for communication does she have?) *(communication functions)*

1.3 Who are the people Busi communicates with? *(communication partners*)

2. Recommendations

2.1 If you are the nurse working with Busi and her mother, what advice will you giver her to help Busi?

2.2 Which different ways of communication do you think Busi should acquire? *(communication means)*

2.3 Which reasons for communication will you encourage Busi to learn? (e.g. what does she want to say with what she does?) *(communication functions)*

2.4 How can you increase the number of people Busi can communicate with? *(communication partners)*

2.5 How can you change things in Busi's environment in order to giver her more opportunities to communicate? *(communication opportunities)*

REFERENCE LIST

American Speech-Language Hearing Association. (1989). Communication-based services for infants, toddlers and their families. *ASHA, May,* 32-34.

American Speech-Language Hearing Association. (1996). Technical report of the ad hoc committee on multiskilling. *ASHA,* 38(2), 53-61.

Berger, M.S. (1980). Problem solving. In M.S. Berger., D. Elhart., S.C. Firshich., S.B. Jordan & S. Stone (Eds.), *Management for nurses*. (pp. 200-205). St Louis: Mosby.

Beukelman, D.R. & Mirenda, P. (1992). *Augmentative and alternative communication. Management of severe communication disorders in children and adults.* Baltimore *:* Paul H Brookes Publishing Company.

Beukelman, D.R. & Mirenda, P. (1998). *Augmentative and alternative communication. Management of severe communication disorders in children and adults. (2nd ed.).* Baltimore *:* Paul H Brookes Publishing Company.

Blackman, J.A. (1995). *Training and continuing education in early intervention.* Maryland : Aspen Publishers.

Blackstone, S. (1991). Intervention with partners of AAC consumers. *Augmentative Communication News,* 4(2), 1-6.

Blischak, D.M., Loncke, F. & Waller, A. (1997). Intervention for persons with developmental disabilities. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 299-339). Massachusetts : Allyn & Bacon.

Bornman, J. & Alant, E. (1999). Training teachers to facilitate classroom interaction with autistic children using digital voice output devices. *South African Journal of Education,* 19(4), 364-373.

Bornman, J. (1998). It takes two to interact but also a few other skills… *Clinica: Applications in Clinical Practice of Communication pathology,* 3, 37-47.

Brandon, J.E. & Majumdar, B. (1997). An introduction and evaluation of problem-based learning in health professions education. *Family Community Health*, 20(1), 1-15.

Croxford, J. & Viljoen, D. (1999). Alcohol consumption by pregnant women in the Western Cape. *South African Medical Journal*, 89(9), 962-965.

Dublinske, S. (1983). The nurse and communication disorders in the schools. In S. Shanks (Ed.), *Nursing and the management of paediatric communication disorders.* (pp. 5–53). San Diego : College-Hill Press.

Freeman, R.B. & Heinrich, J. (1981). *Community health nursing practice.(2nd ed.).* Philadelphia : W.B. Saunders Company.

Fuller, D.R., Lloyd, L.L. & Stratton, M.M. (1997). Aided AAC Symbols. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 48-77). Massachusetts : Allyn & Bacon.

Givens-King, M., Sebastian, J.G., Stanhope, M.K. & Hickman, M.J. (1997). Using problem-based learning to prepare advanced practice community health nurses for the 21st century. *Family Community Health,* 20(1), 29-39.

Goossens' C., Sapp-Crain, S. & Elder, P.S. (1994). *Communication displays for engineered pre-school environments.* Solana Beach : Mayer Johnson Company.

Gorenflo, C.W., Gorenflo, D.W. & Santer, S.A. (1994). Effects of synthetic voice output on attitudes towards the augmented communicator. *Journal of Speech and Hearing research,* 37(1), 48-64.

Haring, T. (1993). Research basis of instructional procedures to promote social interaction and integration. In R.A. Gable, & S.F. Warren (Eds.), *Strategies for teaching students with mild to severe mental retardation.* (pp. 129-164). Wiltshire: Cromwell Press Ltd.

Jacobs, T. (1997). Developing integrated education programmes for occupational therapy: the problem of subject streams in a problem-based course. *British Journal of Occupational Therapy,* 60(3), 134-138.

Johnson, J.M., Baumgart, D., Helmstetter, E & Curry, C.A. (1996). *Augmenting basic communication in natural contexts.* Baltimore : Paul H Brookes Publishing Company.

Kannenberg, P., Marquardt, T.P. & Larson, J. (1988). Speech intelligibility of two voice output communication aids. *Journal of Communication Disorders,* 21(1), 11-20.

Lloyd, L.L., Fuller, D.R. & Arvidson, H.H. (1997). Glossary. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 522-543). Massachusetts : Allyn & Bacon.

Loncke, F. & Bos, H. (1997). Unaided AAC Symbols. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 80-106). Massachusetts : Allyn & Bacon.

MacDonald, J.D. (1983). A conversational approach to language delayed children: Problem-solving for nurses. In S. Shanks (Ed.), *Nursing and the management of paediatric communication disorders.* (pp. 103-164). San Diego : College-Hill Press.

Mast, D.L. (1983). Selecting and implementing communication methods for children. In S. Shanks (Ed.), *Nursing and the management of paediatric communication disorders.* (pp. 225-250). San Diego : College-Hill Press.

McCormick, L. & Schiefelbusch, R.L. (1984). *Early language intervention. An introduction.* Columbus : Charles E. Merrill Publishing Company.

Musselwhite, C.R. & St. Louis, K.W. (1988). *Communication programming for persons with severe handicaps. Vocal and augmentative strategies. Texas :* Pro-Ed.

Quist, R.W. & Lloyd, L.L. (1997). High technology. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 137-168). Massachusetts : Allyn & Bacon.

Rourke, A.(1998, August). *Introducing and developing choices.* Paper presented at the International Society for Augmentative and Alternative Communication Conference, Dublin, Ireland.

Rowland, C. & Schweigert, P. (1993). Analysing the communication environment to increase functional communication. *Journal for the Association for persons with Severe Handicaps,* 18(3), 161-176.

Savin-Baden, M. (1997). Problem-based learning, Part 2: Understanding learner stances. *British Journal of Occupational Therapy,* 60(12), 531-536.

Sailor, W. & Guess, D. (1983). *Severely handicapped students and instructional design.* Boston : Houghton Mifflin Company.

Salvatori, P. (1997). Towards developing a flexible health workforce. *Canadian Journal of Occupational Therapy,* 64(2), 47-52.

Silverman, F.N. (1995). *Communication for the speechless.* Englewood Cliffs : Prentice Hall.

Smith, M.M. (1994). Speech by any other name: The role of communication aids in interaction. *European Journal of Disorders of Communication,* 29(3), 225-240.

Viljoen, D. (1999). Foetal Alcohol Syndrome. South African Medical Journal, 89(9), 958-960.

Westling, D.L. & Fox, L. (2000). *Teaching students with severe disabilities.* Ohio: Charles E. Merrill Publishing Company.

WHO (1999). *ICIDH-2. International Classification of Functioning and Disability. Beta-2 Draft. Full version.* Assessment, Classification & Epidemiology Group. Geneva : World Health Organisation.

Zangari, C. & Kangas, K. (1997). Intervention principles and procedures. In L.L. Lloyd, D.R. Fuller, & H.H. Arvidson (Eds.), *Augmentative and Alternative Communication. A handbook of principles and practices.* (pp. 137-168). Massachusetts : Allyn & Bacon.