Assessment Guide & Kit for Clients who require Augmentative and Alternative Communication Rehabilitation

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Abstract

Augmentative and Alternative Communication (AAC) has grown as an independent field to provide a means of communication for those individuals with little or no functional speech. Over the past few years, different assessment methods have been developed. At present in the West and in India, no single assessment tool is used universally to define candidacy issues for AAC, the system requirements and AAC therapeutic goals. The lack of a comprehensive and exhaustive protocol prompted the preparation of the Assessment Guide & Kit for clients who require AAC rehabilitation. In this study an assessment tool was developed that consisted of a 'guide' and a 'kit'. In the 'Guide', the domains and sub-domains were selected with great care after an exhaustive review of previous assessment methods. Items were placed in a comprehensible manner and validated by two Speech Language Pathologists. Suitable modifications were incorporated. The assessment guide & kit was tested upon three clients of different disabilities (Cerebral Palsy, Mental retardation and Autism) in the age range of 2 to 10 years (Mental age range). Appropriate changes were incorporated in the protocol based on the responses obtained from the clients in terms of 'Comprehensibility of instructions' & 'Scoring' of the sub domains, after which the protocol was finalized. The assessment 'Kit' was prepared simultaneously by collecting the items required to carry out the activities finalized upon.

Introduction

Communication is a process through which one can exchange information, make requests, socialize and interact with each other. Most naturally individuals use spoken language to communicate. Few individuals, though, have disabilities that limit their ability to communicate effectively with others and their surroundings. These individuals require some augmentation of their existing communication abilities or require a completely alternate form to communicate that will enhance their interaction abilities. These forms of communication not only augment the clients speech but also may be used as an alternate mode, are called as 'Augmentative and Alternative Communication' (AAC), which can be understood as methods, systems and/ or devices to enhance communication. AAC is very popular means of communication worldwide, providing a means of expression to speech impaired individuals.

AAC devices vary greatly in nature and the devices that are available to the individuals, range from ones that are very simple and primitive to those that are very sophisticated and which involve advanced technology. Each individual who is in need of an AAC device has certain capabilities, attitudes, aptitudes and requirements. Depending upon these, each individual will have devices that are highly individualized therefore one device will not be like the other.

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As the needs of each individual are so specific, and since the devices need to cater to each individual requirement, it becomes essential that there should be a thorough process or procedure that will tap the prerequisites of the device. So, a detailed and thorough assessment process is a must before implementing the AAC device for communication therapy.

Assessment has been considered as 'a process during which information is gathered to make management decisions' (Yorkston & Karlan, 1986; Bailey & Wolery, 1989; Tomblin, 1994). In AAC assessment, the information is gathered across multiple domains. Various methods have been suggested for different purposes in the AAC assessment (Yorkston & Karlan, 1986; Mirenda, Iacono & Williams, 1990; Reichle, 1991; Von Tetzchner & Martinsen, 1992; Beukelman & Mirenda, 1992; Blackstone, 1993; Silverman, 1995). Some of these purposes include:

1. To determine the functional communication needs of the individual with little or no functional speech and / or writing.

2. To increase or maintain the individuals' opportunities for participation in communication interaction by meeting these communication needs today, tomorrow and in the future.

3. To maintain change within the individual.

4. To measure and evaluate the effects of intervention.

Over the years the assessment process has been guided by many different models. In the early assessment model the focus was on the candidacy issues. Over a period of time, other assessment models have been developed which focus on evaluating the skills and capabilities necessary for operation of the AAC system, though at present there is a lack of consensus regarding what constitutes a necessary skill for the AAC system/ user. The models included: Candidacy model, Communication Model, Participation model and Capability assessment models.

Based on these models, many assessment methods have been proposed by various authors and researchers. They have been summarized below:

Table 1: Summary of the assessment methods proposed by various proponents.

Sl. No.	Name of the Assessment protocol	Authors & Year of development	Description
1.	Decision Matrix	Shane & Bashir (1980)	The decision matrix consists of 10 categories: Cognitive factors, Oral-reflex factors, Language and Motor speech production factors, Motor speech- some contributing factors, Production- some contributing factors, Emotional factors, Chronological age factors, Previous therapy factors, Previous therapy-some contributing factors,& Implementation factors-Environmental. The final decision from the Matrix is to elect, delay or reject an augmentative communication system. Limitations: There is only a Yes/No binary choice decision available.

2.	Assessing non-oral clients	Coleman; Cook & Meyers (1980)	This is a checklist There are 3 phases in the evaluation : Technical evaluation (Including method of accessing the vocabulary, power source, construction method and material, reliability, physical structure etc.) Human factor evaluation (Including user skill and abilities required to operate the devices, features which increase or decrease the performance efficiency etc.) Clinical trials. Assessment of the user is carried out under the sub domains of Physical assessment, Language evaluation and pre-language evaluation. Following the evaluation process, the clinician relates these results with characteristics of speech and language. Limitations: The administration has to be done by professionals who are familiar with non-oral communication & there is no formal test of validity and reliability conducted.
3.	Decision making process in augmentative communication	Owens & House (1984)	This includes 3 separate matrices; Level I- tests whether an AAC system is needed or not. Level II- tests for appropriate mode of selection. Level III- tests for the code of selection. This model abolishes the prerequisite of the Piaget's stages for the candidacy of AAC systems. Limitations: The matrices are just guidelines and are not meant to dictate the order of evaluation & the matrices only use a binary choice of Yes/ No for the decision making.
4.	Communication Needs Assessment	Beukelman; Yorkston & Dowden (1985)	This is in a checklist format The domains within this checklist include- Positioning, Locations, Message needs, Communication partners and Modality of communication
5.	Assessment of communication needs in ICU	Dowden, Honsinger & Beukelman (1986)	This is an assessment checklist for individuals in the ICU who may need an alternative or augmentative form of communication. It consists of the following domains- Environment, Partners, and Message & Modes.
7.	Model for AAC evaluation and system selection	Woltosz (1988).	This model determines the following: Clients' functional needs Clients' skills or abilities, and Environmental factors. From these domains, specifications of the ideal device are generated This model utilizes assessment by feature matching. Limitations: It is time consuming & one requires a good knowledge of devices before its use.
8.	Interaction Checklist for Augmentative communication	Bolton & Dashiell (1991).	This is a checklist. It taps the different entry skills for communication interaction using AAC systems. It also looks into different Strategies (Initiation, Facilitation, and Regulations & Termination) and Contexts used by the child.
9.	Augmentative communication Interaction Checklist	Church & Glennen (1992)	This is a checklist The checklist is filled out following observation through a 30 - minute fun play activity Communication act categories included within this include request: object, request action, statement, yes/ no responses etc.

10.	AAC Information & Needs Assessment	Beukelman & Mirenda (1992).	Assessment is done through Interview The domains assessed include- Current method of communication, Past AAC experiences, Communication environments, Mobility & access, Other technologies and AAC expectations.
11.	AAC activity analysis	Glennen & De Coste (1997).	Assessment is through Interview The assessment is under the domains of – Communication partners, Purpose of activity & Style of communication during activity
12.	Augmentative Communication Assessment Protocol for Symbolic Augmentative Systems	Gamel – McCormick & Dymond (1994).	This is in Checklist and Questionnaire format The skills assessed include-Student skill (Expressive communication, Cognitive skills, Motor skills, Visual skills & Auditory skills), Content of communication, Receipts of communication, Student preferences (Tactile, Visual & Positioning, Interaction & communication), Family & care givers preferences. Through this, a decision about symbolic augmentative communication system is possible. Limitations: This is not very comprehensive in nature.
13.	Augmentative Communication Assessment	Georgia Project for Assistive technology	This is a checklist. It assesses the following domains- Access assessment, Symbol assessment & Augmentative devices evaluated. From the assessment the following are suggested-Communication mode, Access method, Vocabulary, Symbols & Strategies to enhance the device. Limitations: This method is time consuming as it is based on trial and error alone and uses many informal measures for assessment.

In the Indian set up the different methods available are as follows:

Table 2: Assessment methods in the Indian set-ups

| 1. | All India Institute of Speech and Hearing (AIISH) | Mysore | AAC Assessment Protocol has been developed:
• This is a checklist
• The areas assessed include- Language level (Comprehension, Expression, Reading / Writing, Intelligibility), Cognition, Sensory status, Motor status, Facial grimaces, Behavioural status.
• Limitations: The clinician has to infer the requirements of the AAC system required from the protocol & there is no kit to fall back upon. |

2.	Indian Institute of Cerebral Palsy	Calcutta	Under the guidance of Dr. Sudha Kaul the assessment process includes the usage of many tools which include- • Picture Test of Receptive language (Developed by Sudha Kaul), Language Screening test (Developed by Sudha Kaul, 1996), Pragmatic protocol of everyday communication skills in children (Dewart & Summers, 1995), Assessment of AAC Access skills (Includes testing of Gross and Fine motor skills, Seating, Mobility and Occulomotor skills of the individual). • Limitations: Though few of the assessment processes are indigenously made others are taken from the Western set-up directly. The entire assessment is very long drawn. There is, again, no kit to fall back on to perform the assessment.
3.	Spastics Society of India	Bangalore	• This set up utilizes a therapeutics curriculum and checks against the skills the client is unable to perform, which are then taken up for therapy. The AAC curriculum and checklist enables development of new skills for communication and also monitoring of the same skills over a period of time. Different domains are present in the curriculum, like Vocabulary selection and development of low technology, effective communication skills. • No assessment protocol per se is used and also there is no kit present to assess the client with.
4.	College of Allied Health Sciences , Department of Speech and Hearing (MAHE)	Manipal	• There is no indigenously prepared assessment process or protocol used. They rely on the ones prepared by the Western Researchers.

Need of the study

As can be seen from the tables that there have been many assessment protocols developed over the years in the Western set ups. So also in the Indian context, protocols are available, but the tools are simple checklists or questionnaires, which are incapable of providing exhaustive information about the individual client. Some assessment methods used are directly borrowed from the Western set-up with out modifications made for the Indian populations, while some of them are checklists developed directly from the therapy skills required to be developed. The assessment methods are used in those institutes or centers where they have been developed and also no standardization has been carried out of the protocols. The lack of standardization of the protocols for AAC leads to a lot of variance in assessment across the country. All assessment methods and procedures that are available in the Western or Indian context do not include any material to test the clients.

The development of an Assessment Guide and Kit was taken up as, within the India set-ups there is:

1. No protocol which is exhaustive and comprehensive enough to tap all the necessary skills of the client.

2. No protocol is available that looks in to the aspects of candidacy, therapeutic goals to be taken up and the features necessarily required for use of an AAC device.

3. No assessment protocol present which has test items or a kit present along with the written material.

Aims of the study

This assessment kit enables the clinician to:

1. Assess the client's abilities which are required for using an AAC device.

2. Assess the different requirements that the individual needs from an AAC device.

3. Be able to combine the above two to visualize and decide on the appropriate device that a client can use of his communication purpose.

4. Enables the clinician to plan out therapy and choose appropriate therapy goals.

Method

The Assessment Guide & Kit for Clients in need of AAC rehabilitation is prepared for the use of individuals who are beginners in using AAC modes or who are potential AAC users. This assessment kit can be used just before the initiation of AAC therapy by the clinician to know:

1. Whether an AAC rehabilitation is essential for the client

2. The features that are required of an AAC device that can be used most effectively and appropriately with the client and

3. The type of device which suits the client the best during the initial therapy period.

The Assessment Guide & Kit has two components which include,

    a. Written manual or protocol

    b. The Kit

a. The **written manual:** It is the protocol that will guide the clinician through out the assessment process. The protocol is exhaustive and comprehensive. It contains within it many skills which have been tested through specific activities. It also includes questions which are directed to parents or caregivers of the client to probe into specific aspects.

b. The **Kit:** This contains within it the material required by the clinician for assessing skills in the different sub domains. The materials included in the kit are toy models, real objects, picture cards and orthographic or written cards.

The entire assessment protocol should be administered individually on each client. Before beginning to administer the assessment manual, the clinician should familiarize him or herself with the domains, sub domains, activities within each sub domain, scoring system and also the assessment kit and items found within it. Instructions have been provided for the clinician (Speech-Language-Pathologist) to proceed with each activity for identification and assessment of the clients' residual abilities which are essential for the prescription and use of an AAC device. The 'Response Sheet' should be filled up, preferably, soon after the administration of the activities under each sub domain. Once all the individual scores have been recorded, the 'Over all' and 'Total scores' should be calculated. Also the Scoring Sheet should be marked appropriately.

The Assessment kit is meant to identify the needs and requirements of an AAC candidate and it also serves as a useful guide for planning and initiating therapeutic activity. The following are the 3 main domains included in the assessment kit:

Domain I: Assessment to aid in the selection of appropriate AAC devices

Domain II: Assessment of Client or Individual potentials and related factors

Domain III: Assessment of Family & environment related factors

The Structure of AAC assessment Guide & Kit:

Domain I: AAC Devices

The activities in this domain assess the abilities of the individual which are most desirable and appropriate for the selection of AAC device. This domain consists of 5 sub domains which includes the following:

1. Symbols
2. Access methods & Interfaces
3. Tray placement
4. Symbol features
5. Portability

1. **Symbols:** This tests for only 2 types of symbol sets, namely; Orthography and Picture symbols. The symbols have been limited to these due to ease of accessibility of the symbols sets for the clients and their families and frequent use of these in the clinical set ups in India.

2. **Access methods & Interfaces**: 'Access method' refers to the manner in which the client accesses the symbols and 'Interfaces' are the items / modalities / devices through which the symbols can be selected. The sub domain of 'Access method' includes the most common methods that are often adopted in AAC rehabilitation and this includes:

   c. Direct selection
   d. Scanning

The 'Interfaces' that can be inferred by this assessment tool has been limited to three electronic devices (including the manual methods) and they are:

   a. Pointers
   b. Switches
   c. Joystick

d) **Tray placement**: This sub domain assesses for the 'ideal placement or positioning' of the communication tray for the individual client. The decision for placement of the tray, on which the symbols are placed, may be as follows:

   a. Low level
   b. Chest level

    c. Elevated level.

e) Symbol features: This sub domain assesses for the physical attributes of a selected and required symbol system. It includes sections for assessment of:

    a. Size of the symbols

    b. Placement or location of items or symbols on the tray, and

    c. Color enhancement of the symbols.

f) Portability: Assessment of this sub-domain helps to define whether the device should be one that can be easily carried around or not. Hence the binary decisions outcome of this sub domain helps in the selection of a:

    a. Portable AAC device.

    b. Non portable AAC device.

Domain II: Assessment of Client or Individual related factors

This domain aims to assess the client's residual capacities with which he or she can use or manipulate the AAC system most effectively. There are 6 sub domains which are assessed in this section. Each of these sub-domains furthers and facilitates selection of AAC device and helps to decide which features of the AAC device would be more appropriate for the individual client. The 6 sub-domains of this section are as follows:

1. Cognition

2. Mobility or Physical functioning

3. Sensory functioning

4. Behavioural considerations

5. Language

6. Literacy

1. **Cognition:** The various cognitive skills which are necessary for AAC device usage are assessed. The areas assessed include

    a. Attention & Concentration

    b. Memory

    c. Matching

    d. Sequencing

    e. Categorization

    f. Visual presence & Object permanence

    g. Means end relationship

    h. Causality

    i. Spatial relationships

    j. Object concept

g) **Mobility or Physical functioning**: This sub-domain taps the clients' capabilities / potentials / deficits / limitations in the following areas:

    a. Primitive reflexes & Postural stability

    b. Seating/positioning errors

    c. Motor coordination problems

    d. Muscle tone status

    e. Finger pointing ability & grasp- release motor ability in the hand.

h) **Sensory functioning**: In this sub-domain, the clients' sensory abilities are assessed to observe for and obtain information on sensory abilities which may be impaired in the client. This information will help the clinician in making appropriate decision for selection of AAC system. The sensory functions assessed include:

    a. Visual ability

        • Visual field

        • Visual acuity, and

        • Perception of color

    b. Hearing ability

        • Hearing sensitivity

        • Auditory localization, and

        • Auditory memory skills

    c. Tactile ability

    d. Preferences in Visual, Auditory and Tactile stimulus.

i) **Behavioural considerations:** This sub-domain provides scope for obtaining information regarding behavioural problems, if any, in a given client. Most of the responses are elicited as a 'yes-no' or descriptive response to selected questions.

j) **Language:** The language skills which are assessed in this sub domain include:

    a. Comprehension (Syntax & Semantics)

    b. Expressive language skills

    c. Pragmatic or Language use, and

    d. Others (Phonology & Prosody).

k) **Literacy:** This sub domain is used to further the decision of whether to choose Orthographic symbol set or picture symbol set in AAC intervention. The questions probe into the clients' literacy skills and aptitudes, which further helps in deciding the choice of orthographic or picture symbol sets.

Domain III: Assessment of Family and Environment related factors

This domain assesses the nature and extent of environmental barriers and other support systems offered by the family members & / or caregivers and the surrounding environment. This helps the clinician or Speech Language Pathologist in deciding the exact

nature of requirements of the device and in providing information according to the requirements of the client. The sub-domains within this include:

1. Family involvement

2. Environment

1. **Family involvement:** This section probes into the various factors such as the family's interest to help the client, extent of time spent & general attitude towards the client by the family members or caregivers and the psychosocial support that is offered by the family.

2. **Environment:** Depending upon the environmental demands, few decisions regarding the requirements of AAC device are made. The factors of interest include:

    a. (a) Availability or Accessibility of the symbol set

    b. (b) Socio economic status of the family, and

    c. Environmental settings (It refers to the setups the client is exposed to).

Scoring

A 'Response sheet' is available along with this tool, to document the individual clients' scores and descriptive responses for the various skills tested. Total score for each sub domain and an 'Overall Total Score' is calculated. The individual scores of the client under each skill are transferred onto the 'Score Sheet' to give a graphical representation of the client's performance across the domains. These sheets combines enable the clinician to make informed decisions regarding:

- Candidacy issues
- Therapeutic goals for the client
- Features to be utilized while considering the AAC device for the client.

Assessment Kit: For each sub domain activities have been incorporated. For administration of each of the activities a set of items is necessary. All the essential items were collected and compiled together to form the 'Kit' for this manual.

Item Validation: The assessment protocol was subject to item validation by 2 experts. The criteria for selection of these experts include Speech Language Pathologists with:

- A minimal qualification of post graduate degree in the field
- Working experience in AAC intervention and assessment methods or techniques for more than 2 years.

The experts analyzed each activity of the sub-domains. Each activity was assessed and verified for its appropriateness in eliciting the required response in prospective clients for AAC. Those items which had 100% agreement among the experts were incorporated in the protocol while the other items were subjected to modification or omitted.

Usefulness of the protocol

The usefulness of the tool was measured by administering the manual upon 3 subjects of different disabilities, namely, Autism, Cerebral Palsy and Mental Retardation.

The criterion for subject selection was as follows:

- Subject had just begun to attend AAC therapy or were identified as a potential AAC users

- Subject had severe expressive communicative disability
- Subjects with mental age below 12 years.

Suitable changes were incorporated into the tool after the administration of the manual on the clients. The final document was prepared after this verification.

Implication

This assessment kit is an indigenous tool which can be used routinely for assessment of AAC candidates in the clinical set up. It will provide appropriate information for the type and nature of the AAC device that needs to be utilized by the client for their initial AAC therapy.

Summary

Augmentative and Alternative Communication (AAC) grew as an independent field to provide methods and materials to meet the communication needs of individuals with little or no functional speech. Over the past few years the field has grown by leaps and bounds and has become popular the world over, with more and more clients accepting and utilizing AAC.

The past decade has defined different methods for deciding candidacy for AAC and assessment methods have varied greatly. At present in the West, no single assessment method is used universally to define candidacy issues for AAC, the system requirements and AAC therapeutic goals.

Also, in the Indian set-up, there is a lack of a universally accepted assessment protocol. Most of the assessment protocols are indigenously prepared and lack standardization. Few set-ups may even use the Western protocol with adaptations for the Indian populations. The lack of a comprehensive and exhaustive protocol prompted the preparation of the Assessment Guide & Kit for clients who require AAC rehabilitation.

In the 'Guide' or protocol of this study, the domains and sub-domains were selected with great care after an exhaustive amount of review of previous assessment methods, available around the world. Items were placed in a comprehensible manner and then items were validated by two Speech Language Pathologists. Suitable modifications were incorporated. The assessment guide & kit was tested upon three clients of different disabilities (Cerebral Palsy, Mental retardation and Autism) in the age range of 2 to 10 years (Mental age range). Appropriate changes were incorporated in the protocol based in the responses obtained from the clients in terms of 'Comprehensibility of instructions' & 'Scoring' of the sub domains. After which the protocol was finalized. The assessment 'Kit' was prepared simultaneously by collecting the items required to carry out the activities finalized upon.

Recommendations

- The protocol has to be administered on more number of clients with different communication disorders such as Developmental Apraxia of speech, Traumatic Brain Injured clients. Suitable modifications may be incorporated in the tool.
- The protocol is meant for individuals with Mental age below 12 years. The feasibility of using the same for clients with mental age more than 12 years may be explored and accordingly suitable changes or modifications may be incorporated in the assessment guide and the kit of this tool.

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