The Use of a Handi Voice in the Treatment of a Severely Apractic, Non-Verbal Patient

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INTRODUCTION

We wish to describe the therapeutic procedures involved in the design and implementation of a treatment plan using the Handi Voice for three severely impaired apraxic and aphasic patients, and to present the impact of therapy on the patients' life system.

The decision making process used to decide the usefulness of an augmentative communication system is a complex one. The process we used to arrive at the decision to use an augmentative communication device included the following considerations:

1. What is the prognosis for the patient's ability to produce standard language?
2. If an augmentative communication system is to be employed should it consist of a gestural system, writing, the use of a communication board, and/or the use of an electronic device?
3. If the electronic device is chosen, one must also consider type of access modes (coded or direct select), mode of symbolization (pictures or words), and kind of output (voice, printout, or printed display).

Several of these considerations are summarized in a flow chart by DeHaven (1978), (Figure 1).

Shane and Bashire (1978) and Plumley, Medinger, and LaPointe (1979) have also addressed the decision-making process in the use of communication alternatives. Their suggestions include consideration of the special needs of the patient, such as the use of auxiliary switches, the preferences of the family, the demands of the communicative environment, the integrity of the patient's cognitive-linguistic system, a motor speech evaluation, any limiting physical factors, success in prior therapies, and the amount of listener burden required to achieve communicative success. I am going to discuss three case histories of patients with whom we decided to use either the Handi Voice 110 or 120.

Background Information: Patient CB. At the time of the initial evaluation, CB was 68 years old and had suffered a left cerebral infarct in August 1978. Her medical history revealed right hemiparesis and poor fine motor coordination.

The patient was first seen as an inpatient two weeks following CVA. She exhibited severe oral and verbal apraxia; however no auditory processing or cognitive deficits were noted (Table 1). Note that in the spontaneous speech sample obtained during pretreatment testing we used unsupplemented verbal communication, and in the posttreatment testing we used Handi Voice and verbal communication. She received treatment while in the hospital and

Table 1. Patient CV: Speech and language test results.

	Pre Treatment	Post Treatment
I. PICA		
A. Gestural	14.9	14.5
B. Verbal	2.60	8.8
C. Graphic	7.40	11.97
II. SPONTANEOUS SPEECH		
A. Clinic Sample		
1. MLU	0	6.4
2. Communicative Success	0	90%
B. Environmental Sample		
1. MLU	0	6.6
2. Communicative Success	0	96%
III. TOKEN TEST	100%	

as an outpatient, 3 to 5 days a week for 4 months, prior to the introduction of the Handi Voice. The treatment goal during that time was to reestablish volitional control of phonation and short phrases. It should be noted that this patient was initially aphonic and had plateaued in verbal speech training over several sessions prior to the introduction of the Handi Voice. As an interim means of communication the patient was trained to use an alphabetized communication board. (Both signing and writing were unsuccessful due to CB's poor fine motor coordination and/or her listener's poor comprehension of her intent.) Subsequently she was able volitionally to initiate phonation in single words with 90% accuracy; however generalization to spontaneous speech did not occur. She used the alphabetized communication board during communicative interations. However she was frustrated with its slow speed and the lack of communicative success she encountered. Due to the patient's cognitive-linguistic abilities and slow progress in therapy, we began training her to use the Phonic Mirror Handi Voice 110. The 110 is a device which displays words and phrases on the template and the user directly selects the response. The manual dexterity necessary to access the Handi Voice was judged adequate with the use of the template shield.

Treatment Plan. Therapy was designed to: 1) familiarize the patient with the device, 2) allow her to memorize the templates and approximate location of the vocabulary items, 3) increase the speed of programming, 4) determine the environmental impact of the communication device. The

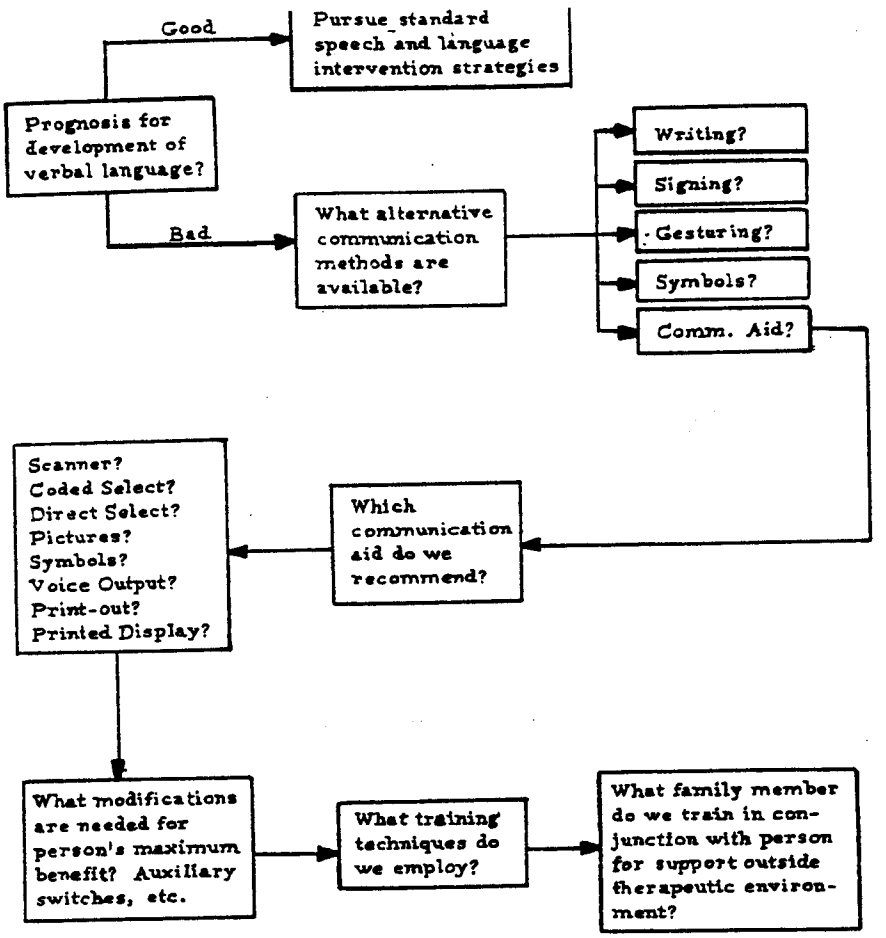

Figure 1. Steps in non-oral evaluation which may lead to recommendation of a communication aid.

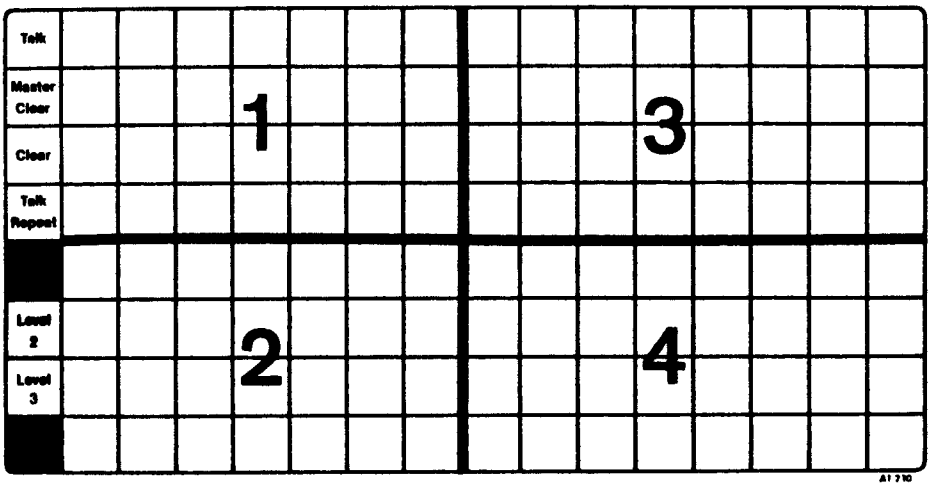

Figure 2. Template for use with Handi-Voice.

introduction to the instrument included familiarizing the patient with turning the machine on, producing words and phrases, and learning programming and memory functions. This was accomplished during the initial session.

To learn the organization of the vocabulary on the four templates, a Xeroxed copy of each template was made and divided into four quandrants, as illustrated in Figure 2. During the next three one-hour sessions, the patient became familiar with the location of the vocabulary items through the use of pseudo-conversations used in the clinic and by memorizing copies of the templates which could be taken home. The patient's family participated in the program by helping to design functional pseudo-conversations and by helping CB memorize the location of the items. Example of pseudo-conversation:

Q: What time will Norma arrive today?
A: 11:00, right after breakfast
1:2 3:4 4:1 2:3

Q: Do you have plans for today?
A: Yes, I need some groceries
3:3 1:2 1:3 4:4 4:3

Two numbers were written under each of the answer portion, the first number refers to the tamplate number, 1 through 4: the second number refers to the quadrant 1 through 4 as illustrated. Quadrant 1 would be the upper left, 2 the upper right, 3 the lower left and 4 the lower right. Using this system the patient was able to quickly determine the approximate location of the vocabulary item.

At this time we requested that the patient lease a Handi Voice so that she could determine whether the instrument was environmentally appropriate. Prior to the patient's receiving the Handi Voice for home use a training session with the family and nurse was scheduled to demonstrate the proper use of the Handi Voice, and its potential.

Therapy with the patient continued during this time to increase her programming speed and to monitor the use of the instrument in her environment. Due to CB's regular environmental use of the instrument during the leasing period, and her continued progress at increasing her programming speed we recommended purchase of the device. Our ultimate goal with this patient was efficient communication, so throughout the training period the Handi Voice was paired with verbal communication training to facilitate maximum communicative success. DB's family continues to work with her to increase control of volitional speech. She attends therapy on a followup basis only so that we may monitor her use of the Handi Voice and her verbal communication progress.

Environmental Impact. CB's frustrations with her inability to communicate verbally and her tendency to communicate too slowly with the alphabetized communication board were notably reduced following training with the Handi Voice. As she experienced increased success when attempting to communicate, she was encouraged to return to any ordinary daily activities that she could manage. At present she has assumed an active role within her family, is able to complete domestic responsibilities, manage family meals, including grocery shopping and food preparation, and pursue social activities outside of her home with family and friends. Prior to regaining communicative ability, she would not leave her home and she avoided most interactions with family members within the home. The patient now has been out of active treatment for over one year. In a recent followup appointment, the patient

reported that she feels that she has returned to nearly all of the same activities she engaged in premorbidly and she also states that she sees herself as communicatively independent.

Background Information: Patient DC. Patient DC was referred to our clinic for an alternative communication evaluation in October 1979. He had had traumatic head injury as a result of an automobile accident in December 1978. During his recovery process he also contracted meningitis. He had severe apraxia of speech (Table 2).

Table 2. Patient DC: Speech and language test results.

	Pre Treatment	Post Treatment
I. SPONTANEOUS SPEECH		
A. Clinic Sample		
1. MLU	2.4	5.7
2. Communicative Success	30%	80%
B. Environmental Sample		
1. MLU	0	4.8
2. Communicative Success	0%	85%
II. WESCHLER ADULT INTELLIGENCE SCALE		
A. Verbal	105 I.Q.	
B. Performance	100 I.Q.	
C. Full Scale	110 I.Q.	

We began training with the Handi Voice 110. However, due to visual perceptual difficulties (the patient had vision in his left eye only) we switched to the Handi Voice 120. This is the device which codes words and phrases with a 3 digit number. Following the previously discussed therapy plan we initially familiarized the patient with the device, helped him to memorize the codes for the vocabulary items, increased the speed of programming, and determined the environmental impact.

He received outpatient treatment one hour per week for 8 months. The goal during that time was to train efficient communication with the Handi Voice. It should be noted that the patient received prior treatment at the time of his hospitalization, with no resulting change in his motor speech ability. Initially we also attempted motor speech training. However, we discontinued it following several weeks without progress.

To help the patient to learn the vocabulary and digital codes, we printed pseudo-conversations and the corresponding codes on poster board large enough for the patient to read. We trained his nurse to work with

him to help him memorize the codes and sent home a drawn replica of the keyboard.

DC quickly memorized the carrier phrases and acquired a functional vocabulary within 12 weeks. At this time we recommended that the patient lease the device to determine its environmental appropriateness. Training sessions were held with the family and nurse to acquaint them with the Handi Voice and instruct them in its use. Therapy with the patient continued to expand his repertoire of words and to increase his programming speed. Both DC's nurse and wife reported significant changes in his communicative success. Consequently DC was motivated to use the Handi Voice with increasing frequency. We recommended that the Bureau of Vocational Rehabilitation purchase the device, and we are currently waiting for their approval. The Bureau of Vocation Rehabilitation is currently completing a work evaluation to determine what kind of sheltered work he might be placed in.

Environmental Impact. Due to DC's severely restrictive physical handicaps we found that the synthesized speech electronic device significantly increased his communicative effectiveness. He was able to interact with individuals in his community, to use the phone independently, and to participate with relative freedom within his home. At present, he continues to attend therapy on a fortnightly basis to monitor his progress and train him in the use of the phonetic codes.

Both of these patients were able to use the Handi Voice within their home environment and generalized its use to new situations and novel utterances. These patients succeeded so well because of their intact cognitive, linguistic and receptive abilities. In addition we have used this program with a severely impaired aphasic person, who was able to learn a corpus of functional words and transfer its use into his home environment.

Background Information: Patient AT. Patient AT presented with severe aphasia with marked deficits in all modalities. He was unable to produce any intelligible speech and had very poor imitative ability (Table 3).

Table 3. Patient AT: Speech and language test results.

	Pre Treatment	Post Treatment
I. PICA		
A. Gestural	10.68	11.4
B. Verbal	4.0	3.85
C. Graphic	7.25	7.57
II. SPONTANEOUS SPEECH		
A. Clinic Sample		
1. MLU	1.7	3.4
2. Communicative Success	25%	60%
B. Environmental Sample		
1. MLU	2.2	3.7
2. Communicative Success	45%	75%
III. TOKEN TEST	0/25 correct	0/25 correct

We designed several programs to increase his comprehension, verbal output and gestural communication, but he experienced little success. The patient's wife requested a trial period of therapy with the Handi Voice. Although we were apprehensive about success, we agreed to try the Handi Voice for a short time. We began with a clear template from the 110, with two pictures on it: one to symbolize food and one to symbolize bathroom. The wife trained the patient to use these two words appropriately at home. (When he touched the picture of bathroom, the Handi Voice said, "Bathroom.") We expanded his one word utterances to a corpus of 20-25 words and then began to teach him to use two word utterances combining agents and actions or states. The patient is currently able to use the trained utterances in his environment but has not yet begun to generate novel utterances. However, with the Handi Voice he is able to communicate functionally and to interact in a limited fashion within his home. We also put some emergency statements in the memory so that he could get help for himself over the phone, if left alone. By pushing just one button he could access, "I am using an artificial voice. This is an emergency. I need help. Please call _____." Recall that the symbols used on the template were pictures. However, when we tried a picture communication board the patient was not at all successful. It might be that the patient's increased performance using a communication system that involved pointing to a picture might be related to a motivational factor. That is, the audible output of the Handi Voice may have enhanced the patient's perception of the normality of his communicative interactions. Another possible explanation may be that the audible output facilitated the patient's ability to self-monitor his communicative attempts. Without question, the use of the Handi Voice expanded the range of situations in which the patient could effectively communicate.

An example of this latter point relates to this patient's ability to call for emergency assistance while alone. We referred this patient to the Bureau of Vocational Rehabilitation in an effort to obtain third party payment for the Handi Voice. Following a work evaluation it was determined that they would purchase the instrument because it would make his wife more independent and free to pursue her own vocation, while his vocational goal would be that of homemaker.

DISCUSSION

Several important issues were raised during the discussion of this paper. It was asked whether patient II was observed to develop learning strategies to memorize the digital codes. We did not observe him using any specific strategies. However, due to his severe physical handicaps he relied heavily on our "teaching strategies."

Patient I did react to the "male soundedness" of the Handi Voice, (despite our raising of the pitch) however, her discomfort was outweighed by her increased communicative independence, and she did not display any reluctance to use the instrument in her daily life.

Finally, we did not notice an increase in the amount of verbal output following training to use the Handi Voice.

REFERENCES

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