Treatment of Aphasia

Martin L. Albert, MD, PhD

Approximately 1 million people have aphasia in the United States today, yet with properly targeted therapy in selected patients effective communication can be restored. Current approaches to treatment of aphasia include psycholinguistic theory-driven therapy, cognitive neurorehabilitation, computer-aided techniques, psychosocial management, and (still on an experimental basis) pharmacotherapy. Arch Neurol. 1998;55:1417-1419

Language is not located in autonomous modules strategically implanted within the left hemisphere (a comprehension module in Wernicke’s area, an output module in Broca’s area, the 2 connected by a single, hard-wired cable). Neuroimaging studies of the last 15 years and contemporary analyses by cognitive neuroscientists have shown that multiple, complex, and overlapping cerebral systems underlie the elements of language. Each system seems to consist of a widely distributed network of cortical and subcortical components, both within and beyond the classic left hemispheric zone of language.

Linguistic and nonlinguistic cognitive functions, such as attention, memory, and executive system functions, are interdependent and may be affected to different degrees in patients with aphasia. Knowledge of how language can be influenced by nonlinguistic cognitive functions (traditionally assigned to the right hemisphere or considered to be linked to frontosubcortical systems) has been useful in developing new approaches to the treatment of aphasia.

This review addresses 3 issues: relevance of aphasia therapy to neurologists, current state of the art, and future trends.

IMPORTANCE OF APHASIA THERAPY TO NEUROLOGISTS

The number of people with aphasia in the United States today, primarily as a consequence of stroke and traumatic brain injury, is estimated at about 1 million. Eighty thousand new patients with aphasia are added to the pool each year from stroke alone.

For some individuals with aphasia, loss of the ability to communicate is tantamount to loss of personhood, and any help they can receive to recover function in this cognitive domain is treasured. Neurologists should know that current approaches to aphasia therapy, carefully tailored to treatment of specific signs and symptoms, actually help selected individuals with aphasia communicate more effectively. Contemporary research in basic neuroscience, cognitive neuroscience, and neuroimaging is expanding our therapeutic options for treatment of aphasia in ways that might not have been considered possible just a few years ago. Consequently, neurologists should work more closely and consistently with speech/language pathologists to help their patients with aphasia.

CURRENT APPROACHES TO APHASIA THERAPY

Efficacy

One reason, I suspect, that many neurologists have been skeptical about the value of aphasia therapy was the relative dearth of statistically valid and reliable studies documenting benefit of aphasia therapy over spontaneous recovery. Research in the last 10 years has changed that picture.

In a meticulously detailed study on the efficacy of treatment for individuals with aphasia, Robey carried out a meta-analysis of 21 studies that provided sufficient information for inclusion. He evaluated 3 classes of effect size: untreated recovery, treated recovery, and treated vs untreated recoveries. He excluded from his analysis all case studies, all studies using single-subject designs, all studies for which the report contained insufficient quantitative information to allow the calcula-
tion of an effect size, and all studies reporting uninter-
pretable effects. His conclusions document the clear
superiority in performance of individuals receiving treat-
ment. The effect of treatment beginning in the acute stage
of recovery was nearly twice as large as the effect of sponta-
neous recovery alone, while treatment initiated after the
acute period achieved a smaller, but nevertheless ap-
preciable, effect.

Holland and colleagues\(^6\) provided another com-
pelling review of treatment efficacy studies in aphasia.
Disregarding case reports in which only anecdotal tes-
timonial data were presented, they noted that nearly
200 studies pertaining to aphasia treatment have been
published in the English language alone. Included in
these reports were large and small group investiga-
tions, single-subject experiments, and single-case
studies. Holland et al conclude that individuals with
aphasia meeting specific selection criteria who are
treated improve more than those who do not receive
improvement. Improvement was documented in both the
quantity and quality of language.

**Treatment Approaches**

The critical clinical issue in current approaches to apha-
sia therapy is the necessity to individualize the thera-
petic modality for the specific aphasic sign or symp-
tom being targeted and the specific person being treated.
Traditional methods of aphasia therapy have been im-
proved by careful selection of timing and frequency of
treatment delivery, more precise delineation of which
aphasic deficit to focus on, more reasoned matching of
therapy technique to deficit, and modification of treat-
ment modality as the syndrome evolves. For each of these
clinical elements, an informed neurologist, working in
therapeutic partnership with the speech/language pa-
thologist, can manifestly aid the patient.

**Output-Focused Therapy.** Most speech/language pa-
thologists still use the technique known as stimulation-
response or direct retraining of deficit, as one aspect of
their therapy program. First, the aphasic deficit is iden-
tified and, then, repetitive drill through several modal-
ities (eg, reading or repetition) is encouraged. An end-
less array of sophisticated modifications of this traditional
approach has been developed.\(^7\)

A newer technique, called melodic intonation therapy
(MIT), is neurobehaviorally based. Through its Thera-
petiques and Technology Assessment Subcommittee, the
American Academy of Neurology has identified MIT, cur-
rently in use worldwide, as an effective form of output-
focused language therapy.\(^8,9\) Melodic intonation therapy
is a formal, hierarchically structured treatment program
based on the assumption that the stress, intonation, and
melodic patterns of language output are controlled pri-
marily by the right hemisphere and, thus, are available
for use in the individual with aphasia with left hemi-
sphere damage. Melodic intonation therapy, in essence,
consists of intoning normal language with exaggerated
rhythm, stress, and melody. The subcommittee deter-
mined that MIT was effective for patients with Broca’s
aphasia, if used in its full and formal manner.

**Treating Linguistic Deficits—Psycholinguistic Approach.**
The psycholinguistic approach to aphasia therapy applies
information-processing models of normal cognition to an
understanding of language disorders.\(^10,11\) An attempt is made
to identify the locus of the language deficit within the
cognitive/linguistic structure of normal language. An anal-
ogy might be the search for a missing or defective enzyme
within a complex metabolic system. The premise under-
lying this approach is that a specific aphasic sign or symp-
tom may be the surface clinical manifestation of different
underlying deficits within the cognitive structure of lan-
guage. Only by uncovering the precise underlying psycho-
linguistic deficit can therapy be properly targeted. To date,
the clinical phenomena of anomia and agrammatism have
been most responsive to this approach.

**Treating Related Neurobehavioral Deficits—
Cognitive Neurorehabilitation.** A newer approach to
aphasia therapy is based on the idea that the ability to
communicate is dependent not only on linguistic com-
petence but also on related neurobehavioral functions,
such as attention and memory. The assumption is that
brain damage that produces aphasia also produces dis-
turbance in other, language-related cognitive functions,
and that treatment of these other cognitive deficits can
facilitate communication. Holland\(^12\) outlines the strengths
and limitations of this approach.

For example, virtually all individuals with aphasia de-
velop perseveration, which interferes with communicative
capability. In 1988 Helm-Estabrooks and colleagues\(^13\)
introduced Treatment for Aphasic Perseveration,\(^9\) and
demonstrated that cognitive therapy focused on related
neurobehavioral deficits, in this case perseveration, can
improve language function in individuals with aphasia.

McNeil and colleagues\(^14\) have long argued that in-
dividuals with aphasia suffer a deficit in allocation of at-
tentional resources and proposed an “integrated atten-
tion theory of aphasia,” asserting a relation among
attention, arousal, and language processing. This argu-
ment receives support from contemporary research in cog-
nitive neuroscience, in which a left hemisphere atten-
tional system linked to language has been described by
Posner.\(^15\) Indirect evidence exists that attempts to treat
attentional dysfunction in individuals with aphasia may
ameliorate the language disorder; and experimental
studies are just beginning to test this hypothesis.

**Computer-Aided Therapy.** Of the many attempts to ben-
efit individuals with aphasia by means of computer-
aided therapy, perhaps the most creative was intro-
duced by Baker and colleagues\(^16\) in the middle of
the 1970s\(^17\) and further developed by them and by
Weinrich and colleagues\(^18\) over the next 20 years.

Computerized visual communication (or C-VIC) was de-
signed as an alternative communication system for pa-
tients with severe aphasia and is based on the notion that
those with severe aphasia can learn an alternative sym-
bol system (alternative to the symbol system used in natu-
ral language) and can use this alternative system to com-
municate. Pictures or icons, representing meaningful
concepts or things, are developed and loaded into a com-
puter. The patient with aphasia learns to manipulate these
icons on the computer screen for purposes of communication. According to Weinrich and colleagues, most patients with severe aphasia whom they tested could master the mechanics of the system, learn icons for proper and common nouns, and use them in simple sentences, although they produced their sentences agrammatically. Nevertheless, teaching patients with severe aphasia to communicate by computer, even with agrammatic output, is a remarkable achievement.

Treating the Whole Person—Psychosocial Aspects and Pragmatics. Martha Taylor Sarno, one of the pioneers of modern aphasia therapy, has also been one of the staunchest supporters of the effort to manage the whole patient, to help the patient recover functional communication using all techniques possible in a comprehensive therapy program. She says that “the condition of aphasia should not be limited by a definition which separates the language pathology from the person.”

One of the most active movements in current aphasia therapy is related to Sarno’s cautions. Group treatment, focusing on regaining conversational skills, and on developing alternative strategies for communicating despite aphasia, is becoming increasingly popular. Interpersonal social contexts for developing effective supported communication are themselves the focus of treatment.

One technique that has gained considerable popularity is Promoting Aphasics’ Communicative Effectiveness (or PACE). In this program the emphasis is on enhancing communicative ability, nonverbal as well as verbal, in pragmatically realistic settings. Use of compensatory strategies is encouraged, with less of a focus on relearning a lost or deficient linguistic skill, and more on improving communication by any means possible.

NEW DIRECTIONS IN THERAPY FOR APHASIA

Pharmacotherapy for aphasia is a new, still experimental, and somewhat controversial adjunct to other therapeutic approaches, and one which may, at last, capture the attention of neurologists on behalf of their patients with aphasia. In contemporary cognitive neuroscience, disorders of memory are being fractionated, with different components of memory systems correlated with abnormal levels of specific neurotransmitters. Similar attempts are being made to understand the cognitive neurochemistry of language. Grossly, and as yet without fully adequate experimental support, language output abnormalities have been linked to dopaminergic system deficiencies and anomia and auditory comprehension disorders have been linked to cholinergic system deficiencies. Single-case studies, in which the patients serve as their own controls, have demonstrated remarkable improvement in language function following pharmacotherapy for aphasia using this chemicocognitive model. Few well-controlled studies have been carried out, however, and these, to date, have been less convincing than the single-case studies. Nevertheless, a detailed and critical review of the topic concludes “when used as an adjunct to behavioral therapy, pharmacotherapy appears to have benefit.”

Accepted for publication May 28, 1998.

This study was supported by the Medical Research Service, Department of Veterans Affairs, Boston, Mass, and grant DC-00081 from the National Institutes of Health, Bethesda, Md.

Harold Goodglass, Nancy Helm-Estabrooks, Audrey Holland, and Barbara Dworetzky offered helpful comments on earlier drafts of the manuscript.

Reprints: Martin L. Albert, MD, PhD, Harold Goodglass, Aphasia Research Center, Boston Veterans Affairs Medical Center, 150 S Huntington Ave, Boston, MA 02130.

REFERENCES