

Advances in Geriatrics

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New Approaches to Understanding and Treating Aphasia

Stroke is one of the leading causes of disability among older Americans, and the VHA estimates that 15,000 veterans are hospitalized for stroke each year.¹ Although stroke rehabilitation tends to focus on the physical consequences of the disease, stroke also is a common cause of communication disorders, including aphasia. Approximately 20% of stroke survivors have persisting aphasia,² and the VHA's outpatient clinics treat 2,000 new cases of aphasia annually (A. Basvaraju and S.R. Pratt, unpublished data, 2008). The negative consequences of aphasia include psychosocial difficulties, reduced functional independence, and diminished vocational opportunities.

Established in 1999, the Geriatric Research, Education and Clinical Center (GRECC) at the VA Pittsburgh Healthcare System (VAPHS) in Pittsburgh, PA focuses on both the causes of and rehabilitation from stroke. The GRECC's basic laboratory research program works to develop new therapeutic approaches for stroke by addressing the molecular mechanisms that underlie the death of neurons and the mechanisms that promote repair and recovery. Its rehabilitation research program focuses on the cognitive mechanisms underlying

aphasia,^{3,4} the treatment of aphasia and related disorders,⁵ and the development of tests for quantifying narrative production and comprehension.^{6,7} The GRECC also has developed the Burden of Stroke Scale,⁸⁻¹⁰ a new measure of patient-reported physical and cognitive activity limitations and psychological distress. Clinically, the GRECC focuses on optimizing poststroke care for elderly veterans through multidisciplinary, primary care services provided in outpatient, long-term, and home-based settings.

Most recently, the GRECC has collaborated with the VAPHS's Audiology and Speech Pathology Program to develop the Program for Intensive Residential Aphasia Treatment and Education (PIRATE), a clinical demonstration project aimed at aphasia rehabilitation. This program, previously unavailable anywhere in the VHA, was conceptualized by a team of frontline VAPHS speech-language pathologists and GRECC researchers in collaboration with GRECC physicians and domiciliary staff. The PIRATE program combines innova-

tive service delivery methods with evidence-based care and is designed to increase access to care and improve patient outcomes.

UNDERSTANDING APHASIA

Aphasia is an impairment of language performance, usually resulting from focal brain damage involving the dominant (ordinarily the left) hemisphere.¹¹ It is a general language impairment, meaning that for any given case, deficits will be present in all input and output modalities, including speaking, listening, writing, and reading. The language impairment of aphasia is not attributable to dementia, delirium, coma, sensory loss, or motor impairment. Dysarthria—speech impairment resulting from neuromuscular dysfunction—is excluded from the definition of aphasia, although the two conditions frequently co-occur. Also, the language impairment of aphasia is disproportionate compared to any other cognitive deficits that are present. It should be noted, however, that aphasia can affect performance

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The VHA's Geriatric Research, Education and Clinical Centers (GRECCs) are designed for the advancement and integration of research, education, and clinical achievements in geriatrics and gerontology throughout the VA health care system. Each GRECC focuses on particular aspects of the care of aging veterans and is at the forefront of geriatric research and clinical care. For more information on the GRECC program, visit the web site (<http://www1.va.gov/grecc/>). This column, which is contributed monthly by GRECC staff members, is coordinated and edited by Kenneth Shay, DDS, MS, director of geriatric programs for the VA Office of Geriatrics and Extended Care, VA Central Office, Washington, DC.





Figure. A speech pathologist and resident of the Program for Intensive Residential Aphasia Treatment and Education at the VA Pittsburgh Healthcare System.

on tasks that measure other areas of cognition, such as memory and attention.

Aphasia's universal features include anomia, or word finding difficulty; impairment of auditory comprehension; and moment-to-moment variability in language performance. The condition can cause many types of anomic errors, including simple failures to retrieve the intended word (which can be a person, place, thing, idea, action, or relationship); circumlocutory responses (for instance, saying "I use it to find my way," in place of simply saying the word "compass"); and paraphasias (substituting words and using them in inappropriate ways, such as using the words "knife," "fort," "forp," or "stocktery"

for the word "fork"). Aphasia-related auditory comprehension impairments can range from subtle deficits that go unrecognized without formal assessment to impairment so profound that even the simplest language cannot be understood. People with aphasia can have highly variable responses to repeated presentations of the same item, although they usually are stable in their overall language performance once physiologic recovery is complete.

The classical categories of aphasia, of which Broca's and Wernicke's are the most familiar, are based on a model described by Wernicke and Lichtheim in the late 1800s and revived by Geschwind in the 1960s.¹² This framework—often referred to as

the Boston classification system—is based on hierarchical dichotomies of fluent versus nonfluent speech, intact versus poor comprehension, and good versus poor verbal repetition. While the framework still is used by many clinicians and researchers, it is increasingly recognized that these categories have limited value for understanding and treating aphasia—primarily because they are heterogeneous and fail to capture important distinctions. Auditory comprehension deficits, for example, can have many different underlying causes, including poor sound discrimination, impaired recognition of individual word forms, or impaired access to word meanings.

APHASIA TREATMENT OVERVIEW

A large number of treatments for aphasia have been described. One broadly influential method is stimulation-facilitation therapy, which focuses on restoring function.¹³ In this approach, the clinician asks the patient to perform tasks such as naming objects, following spoken commands, or describing recent events. The clinician facilitates appropriate responses by using repetitive auditory-verbal stimulation and manipulating such stimulus factors as speech rate, length of spoken stimuli, word frequency, presentation of cues, and supplementation with visual modalities. Patients are not permitted to struggle for their responses, and the clinician focuses on eliciting a large number of correct responses in each session, rather than on correcting errors. As responses are elicited hundreds of times to varying stimuli, they become more available to the patient and language function improves.

Clinical aphasiologists also use models of specific language processes to inform treatment. For example, psycholinguistic models of normal word production, which suggest that the meanings and the sounds of

words are activated in distinct stages, have been applied usefully to the description and treatment of word finding deficits.^{14,15} Similarly, models of syntax borrowed from linguistics have been used to motivate successful treatments of sentence comprehension and production.¹⁶

The evidence clearly suggests that aphasia therapy is effective.¹⁷ A VA cooperative study demonstrated the benefits of aphasia therapy versus no treatment in a postacute sample,¹⁸ and a subsequent German study replicated this finding.¹⁹ Recent meta-analyses have found that more intensive therapy schedules lead to greater treatment gains.^{20,21} The American Congress of Rehabilitation Medicine recommends postacute language treatment as a practice standard,²² and the VA/DoD Clinical Practice Guideline for the Management of Stroke Rehabilitation gives treatment of chronic aphasia an “A” level evidence rating.²³ There also is evidence that behavioral changes resulting from intensive aphasia therapy are associated with neuroplastic changes in functionally relevant areas of the brain.²⁴

Current treatment limitations

One limitation of aphasia treatment is that it's labor-intensive, for both the clinician and the patient. A substantial investment of time—often over the course of months—and effort is needed for gains to be realized. After physiologic recovery is complete, communication gains tend to be limited to those aspects of language function receiving direct treatment, and generalization of reacquired responses to untrained stimulus items sometimes is sparse or lacking entirely. Additionally, successful transfer of improved language performance to environments outside a poststroke clinic often requires sustained and directed effort.

In recent decades, these limitations, along with trends in health care

delivery services (including managed care and decreasing reimbursement schedules), have led some speech-language pathologists to shift away from the impairment-based, restorative interventions described above and toward compensatory approaches to managing aphasia. Such approaches—variously described as “functional,” “life participation,” or “social” approaches—generally seek to modify the environment of the person with aphasia through counseling significant others, training in alternative communication techniques, and community advocacy. For example, a couple in which one partner has aphasia might be instructed on effective conversational techniques, including the use of verification questions, supplementing verbal output with writing, and allow-

A vitally important task facing the discipline of clinical aphasiology is to better define the combinations of treatment and patient characteristics that produce the best outcomes. In general, we know that aphasia therapy works, but in order to make the most effective use of limited clinical resources, we must know exactly what works and for whom it works.

PIRATE: AN EFFECTIVE APPROACH

PIRATE is an advanced clinical access service delivery model designed to eliminate the barriers that prevent community dwelling veterans with aphasia from accessing language rehabilitation services. It is modeled, in part, on the University of Michigan Aphasia Program (UMAP), which was

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ing extra time for the spouse with aphasia to respond. While these interventions often have been described in opposition to impairment-based methods, it is increasingly acknowledged that treatment optimally should incorporate both restorative and compensatory approaches.

Access to care is another important issue related to aphasia. Like stroke rehabilitation in general, most aphasia treatment has shifted to outpatient settings. Because VHA facilities often have wide catchment areas, transportation difficulties frequently limit access to care (especially for intensive treatment), resulting in higher missed opportunity rates and poorer patient outcomes.

originally established in 1947 for the benefit of World War II veterans. The UMAP currently provides six weeks of intensive, residential aphasia treatment to the general public on a fee-for-service basis. A retrospective study reported that patients participating in the UMAP had better language outcomes following their participation than after comparable periods of no treatment or less intensive treatment.²⁵ PIRATE is intended to provide similar services to veterans at greatly reduced costs through the effective utilization of existing VA resources. In developing the program, we conducted a cost recovery analysis using the Veterans Equitable Resource Allocation model,

which showed that the program can be at least cost-neutral.

PIRATE participants stay in residential villas located on the H. John Heinz III VA Progressive Care Center of the VAPHS. The villas include private bedrooms, bathrooms, living rooms, kitchens, and laundry facili-

One purpose of encouraging family participation in individual treatment sessions is to enable family members to practice effective communication techniques with their loved one who has aphasia. This participation also helps to transfer the patients' individual treatment gains to their

publications. We hope that within four years, the PIRATE model will be replicated in other VISNs and allow broader access to intensive, evidence-based treatment for veterans with aphasia. ●

Author disclosures

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Structured conversational interactions between patients and program volunteers are used to transfer treatment gains to everyday interactions.

ties. During each 17-day PIRATE program, participants receive six hours per day of evidence-based aphasia intervention services. Occupational therapy, physical therapy, and nursing services also are provided as needed to facilitate patients' safe participation in the program. Sessions are offered on a bimonthly schedule, with each program serving three to four veterans. To date, participation is limited to VHA-eligible veterans with aphasia who reside in the VISN 4 catchment area and who are medically stable and ambulatory or able to transfer independently from wheelchair to bed and toilet.

Other PIRATE services include individual therapy sessions, group treatments, and computer-based learning activities. Individual and group therapy sessions employ both restorative and compensatory methods. Educational and counseling sessions for family members and caregivers are conducted upon the patient's entry into the program, on both Saturdays during each session, and on the patient's exit from the program. Family members also may participate in additional sessions as their schedules permit, although housing is available only for veteran participants.

interactions with family members. To further promote the transfer of treatment gains, these interactions and all group treatment sessions target language behaviors and employ stimuli used during individual sessions. Similarly, structured conversational interactions between patients and program volunteers are used to transfer treatment gains to everyday interactions.

As of May 2009, three PIRATE sessions serving a total of eight veterans have been completed. In addition, three stroke survivors with aphasia were enrolled for the program's July 2009 session, and applications were being reviewed for the September session. An evaluation of PIRATE will be conducted at the end of the program's first year of operation. Evaluation measures will include a performance-based assessment of language function,²⁶ an assessment of functional communication by family members or caregivers,²⁷ and a patient-reported measure of functioning and well-being.¹¹ Data obtained from these measures will be aggregated across patients, analyzed using appropriate statistical procedures, and disseminated at local and national VHA meetings and in appropriate printed

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