Case Study in Global Aphasia of Patient
With Left-hemisphere Ischemic Stroke

Global aphasia is a severe form of aphasia that affects a person's expressive and receptive language abilities (Davis, 2007). This case study examines the evaluation and treatment of a 56-year-old woman diagnosed with global aphasia following a left-hemisphere ischemic stroke. Of special interest are such outcomes as: whether or not the patient will be able to return to work after treatment and recovery; whether the patient will successfully learn to write with her nondominant (left) hand; and if speech-therapy "homework assignments" prove to be an effective component of the patient's treatment plan.

**Patient's Biographical Information**

The subject of this case study, referred to as EN (not her true initials), began treatment for global aphasia approximately four weeks after her stroke. A 56-year-old female, the patient's health conditions include diabetes and hypertension. These two factors are very much associated with the likelihood of stroke. As George, Hong, and Bowman (2015) state in the CDC publication *Public Health Reports*: "Hypertension is the most important risk factor for stroke. Up to half of all strokes may be due to uncontrolled hypertension."

The patient's diabetes was of course another risk factor for ischemic stroke (Mankovsky et al., 1996). Incidentally, while diabetes as a risk factor seems generally accepted, there appears to be some debate as to whether diabetes correlates with worse functional outcomes following a stroke. According to Mankovsky et al. (1996), "Stroke patients with diabetes have a higher mortality rate, worse neurologic outcome, and more severe disability than those without diabetes." However, Ripley et al. (2007) state: "Persons with diabetes who suffer a stroke seem to benefit and improve during their acute rehabilitation stay at levels equivalent to peers who are not diagnosed with diabetes." It should be emphasized that Ripley et al.'s (2007) findings expressly refer to the "acute
As far as the patient's physician is aware, this is EN's first stroke. The treating speech-language pathologist (SLP) states that given the patient's health history, previous transient ischemic attacks (TIAs) are not unlikely. However, according to the American Stroke Association (2012), TIAs usually do not result in permanent damage. Therefore, the damage to the patient's left hemisphere is very likely specific to the recent stroke.

Prior to her stroke, EN worked for 11 years as a certified nursing assistant (CNA). Since her stroke, she has been on short-term disability as she has not recovered enough function (physically and cognitively) to return to work as a CNA. As is not uncommon following a left-hemisphere stroke, the patient has right-side hemiparesis. She can walk, but she has not driven a car since the stroke. The speech-language pathologist is unsure whether EN is "medically cleared" to drive, but she does know that the patient reports that she currently does not drive.

Another effect of the right-side hemiparesis is that the patient no longer has the ability to write with her right hand, which has been her dominant hand. Part of EN's treatment will involve learning to write with her left hand.

Upon release from the hospital, EN received speech-language therapy for 1-hour sessions twice weekly. She received a total of 17 treatment sessions over the course of 2.5 months.

**Neuro-radiological Findings**

The SLP did not have access to the patient's neuro-radiological report. The SLP did have access to physician notes confirming a lesion in the patient's left hemisphere consistent with an ischemic stroke. Furthermore, EN presented with signs and symptoms typically associated with a left-hemisphere stroke affecting critical expressive and receptive language areas. These deficits were evaluated during the SLP's assessment.


ASSessment

At the beginning of treatment, the SLP administered the Western Aphasia Battery (WAB). EN's performance indicated difficulty with written language, expressive language, and comprehension. The SLP also performed informal assessment by observing the patient both during the session as well as at times when the patient interacted with the receptionist and her daughter in the waiting area. Results of the WAB and the SLP's formal and informal observations culminated in a diagnosis of global aphasia. Global aphasia is "a severe depression of language ability in all modalities" (Davis, 2007).

Global aphasia is categorized as a "nonfluent" aphasia, given the impairment of language production. The so-called nonfluent aphasias may also be referred to as the "anterior" aphasias, as they typically involve lesions to the anterior language portions of the brain, such as Broca's area. However, one key way in which global aphasia differs from Broca's aphasia is that the patient has difficulties with language comprehension as well as production. This was indeed the case with EN.

EN's global aphasia was characterized by anomia, a relatively high incidence of phonemic paraphasias, and some semantic paraphasias. For example, she referred to a hamburger on a cafeteria tray as "fish" (most likely semantic paraphasia) and might say "clues" for "shoes" (phonemic paraphasia).

The SLP's assessment was not limited to speech and language. Another component involved communicating with EN's physical therapist (PT) and occupational therapist (OT). Through this interaction, the SLP learned that EN would not be able to write with her right hand anymore, so any therapy that involved written language should take that into account.

Also, the PT and OT expressed that EN was highly unlikely ever to return to work as a CNA, regardless of how much language function EN recovers. The physical demands of work as a CNA include lifting patients, dressing them, helping them walk, transporting them
in wheelchairs, and manipulating various kinds of equipment, just to name a few. In EN's case, the hemiparesis was expected to be permanent. She would no longer be able to perform the rigorous manual labor tasks of a CNA.

In addition to physical duties, a CNA's role includes writing notes in charts and communicating effectively in what is often a fast-paced and sometimes stressful environment. This can be difficult for many individuals, even those who have not experienced a cerebrovascular accident (CVA); it would be especially challenging and perhaps even dangerous for EN to attempt. CNAs need the ability to respond to emergencies quickly, which EN might not ever be able to do at the same level she could before her stroke.

EN's case exemplifies a particular challenge that can arise with stroke patients. At 56, EN is still years away from the typical retirement age. However, she is at a life stage where it is very difficult to start an entirely new or different kind of career. Not having a college education also imposes some limits on the kinds of jobs EN might be able to secure. Ideally, a patient such as EN would be connected to a vocational rehabilitation counselor. Vocational rehabilitation counselors can help a patient re-enter the workforce after an event such as a stroke. They can ease the transition of a return to a previous job or help the patient find work that accounts for his or her different set of abilities.

With the knowledge that EN was very unlikely to return to work as a CNA, the SLP was better equipped to create functionally relevant goals for EN's speech-language therapy. In this case, it would be inappropriate for the SLP to create goals based on returning to work as a CNA. Instead, the treatment goals ultimately focused on independence in activities of daily living (ADLs).

From a psychological perspective, it was important that the SLP knew EN faced a change in her working life. EN's family expressed that overall, she had liked working as a CNA, as she enjoyed working with people and especially talking to them. This meant that
along with the physical and cognitive changes following the stroke, EN was also experiencing the loss of work that gave her purpose and provided income. Furthermore, anxiety and depression are already associated with acquired brain injury such as a stroke: "The most common reactions to acquired brain injury, particularly in the postacute state, include depression, anxiety, lowered self-esteem, dependency, and perplexity" (Sohlberg & Mateer, 2001).

Also relevant to EN's speech-language treatment plan was the fact that depression following stroke (or "poststroke depression") can significantly impact a patient's motivation and progress during communication therapy (Swindell & Hammons, 1991). Moreover, Swindell and Hammons (1991) note that at least one study indicates poststroke depression is especially associated with left-hemisphere infarctions (as opposed to right-hemisphere lesions). While it is not the SLP's role to treat depression nor to serve as a psychological counselor, he or she is in a position to identify early signs of depression and make the appropriate referrals. Also, the SLP can make treatment choices that could ameliorate depression: for example, suggesting group therapy in an effort to mitigate social isolation.

With respect to EN, the SLP knew that the patient had superior access to counseling resources within this particular outpatient facility as compared to other rehabilitation clinics. The SLP made sure to confirm that EN knew how to access counseling if needed. Overall, the SLP did not note any strong indicators of depression that might merit a referral to a psychologist or psychiatrist. In fact, compared to many other patients the SLP has treated for global aphasia, EN was exceptionally motivated and energetic. She was highly focused on recovery and accepting of her situation.

Speech and language assessment was not limited to the beginning stages of EN's treatment. The SLP consistently recorded data during each session to track efficacy of different techniques. Progress was evaluated at periodic intervals throughout treatment.
Treatment

EN's treatment consisted of twice-weekly sessions, each an hour long in duration. The SLP made a special effort to always begin with a task that she knew EN could accomplish with minimal or no difficulty. The middle of each session was devoted to tasks with which EN had more difficulty. The SLP made sure to end each session with items that presented little difficulty. The aim was to start with success and end with success. This is important for maintaining motivation and morale.

The goals for EN's treatment centered around activities of daily living. Some specific ones were: balancing a checkbook and paying bills; communicating via telephone and in person to schedule appointments (medical as well as social); and developing a "script" for EN to use to address questions about her condition.

In early sessions, EN could barely say her name. However, she could respond consistently to "yes/no questions." The SLP made extensive use of these throughout treatment but especially during the initial stage.

The SLP also spoke with EN's daughter about the use of yes/no questions so the daughter would have a way to communicate with EN at home. While the daughter did not live with EN, she checked on her daily and transported her to and from appointments as well as assisted with getting groceries, outings, and other activities. Having a starting point for communication eased frustration for both the daughter and EN.

During an early session, the daughter expressed to the SLP that no one in the hospital or acute care had ever explained to her just what aphasia is and what it meant for her mother's future. The daughter understood that her mother "couldn't talk," but she confessed she didn't know if her mother could really understand what others said. She said she felt like she never truly got the chance to ask for clarification in the hospital, which had been an overwhelming and intimidating experience (not to mention emotional, as her mother had just had a stroke).
The SLP explained to both the daughter and EN that global aphasia meant EN had difficulty with both speaking as well as understanding what other people say. The SLP explained that speech-language therapy would help EN re-learn these abilities as much as possible, but time would tell how much she would be able to recover.

The SLP was careful to not share predictions with the family. That said, EN's overall prognosis for language was that at least some improvement could be expected, due to several factors. First, there is usually a degree of spontaneous recovery among most stroke patients during the initial weeks and months following the CVA (Fridriksson, 2008). Second, the patient was motivated, as evidenced by her attitude during therapy and compliance with homework assignments the SLP provided. One example of a homework assignment was using a photo album with a set of images in it in different ways. Sometimes the assignment was to simply look at the pictures and listen to a recording of the words on CD. Other times, the instructions were to practice saying the word for each picture before confirming the correct response with the CD. Later in treatment, the task became to write the name of the object in the picture.

At-home practice for patients receiving speech therapy appears to facilitate overall progress. One study of patients who were assigned language therapy homework with a specially designed iPad app for aphasia indicated that "patients who logged on more often showed more changes on the tasks assigned" (Kiran et al., 2013). It should be noted, however, that this particular study was part of a presentation at the 2013 ASHA convention (as opposed to published in a peer-reviewed journal). The main author also disclosed a significant financial interest in the success of this iPad app.

Another reasonable prediction for EN's recovery is that, in general, language comprehension tends to recover better or sooner than language production (Fridriksson, 2008). Therefore, it was not unlikely that EN's global aphasia could eventually become more
similar to Broca's aphasia; it could also improve beyond that, depending on a number of variables.

Initial sessions focused first on naming. The SLP would have EN start with something basic such as "tell me your name." Even this was difficult at first, so the SLP paid careful attention to the pacing of the sessions.

Naming tasks included extensive use of the SLP's Language Activities Resource Kit (or "LARK box"). The kit includes physical objects common to daily life as well as pictures of these objects. This tool enabled the SLP to work with EN on both expressive as well as receptive language (comprehension). Sometimes the SLP asked EN to name specific items. Other times she would provide a one- or two-step directions such as "Pick up the hairbrush" or "Pick up the hairbrush and show me what you use it for."

During each session, the SLP recorded correct and incorrect responses with different activities. As EN improved, the therapist adjusted the tasks to increase slightly in difficulty. If a technique did not appear to correspond with improvement, the SLP replaced it with a different strategy.

Another treatment technique the therapist utilized was auditory closure (essentially, completing sentences). The SLP had EN complete different sentences such as "My name is ________." Finishing common phrases was another component: "Night and ________ (day). Monday through ________ (Friday)."

With respect to multi-step tasks and following directions, the SLP strove to keep treatment as practically based as possible. An example of multi-step instructions the SLP requested of EN might be: "Pick up your phone, pretend to dial your doctor's office, then ask them when your next appointment is." This differs from instructions such as "First touch your nose, then stick out your tongue, then state your pet's name," because those tasks are not something the patient is regularly called on to perform in daily life. Indeed, verifying whether
a patient can follow basic directions such as "point to the window" can be an important part of assessment. However, such a task is not necessarily as applicable to treatment, because it is a relatively unnatural activity. Of course, one might also consider naming objects to be an unnatural activity as well. However, studies do indicate that the ability to name is correlated with lexical retrieval, which greatly facilitates conversation (Fridriksson, 2008).

In addition to receptive and expressive language tasks, the SLP worked with EN on writing with her left hand. EN had difficulty and experienced frustration with this process, but she was able to progress from tracing letters with the OT to copying her name and writing out math problems. Success in learning to write with one's non-dominant hand due to an injury to the dominant hand appears difficult to predict. One study suggests that such performance varies among individuals and indicates a need for a systematic, evidence-based protocol to serve this population (Yancosek et al., 2011).

Over the 2.5 months of treatment, the patient made strong improvement in language comprehension and strong-to-moderate improvement in language production. Toward the end of treatment, EN continued to struggle with some anomia and produce semantic and phonemic paraphasias on occasion. However, EN was still able to get communicate messages with minimal frustration on most days.

The SLP dismissed EN when it was her clinical opinion that EN could accomplish the initial treatment goals that would enable her to live independently. From a data standpoint, this meant that EN was consistently accomplishing the objectives of the individual sessions with at least 80% accuracy. Before dismissal, the SLP equipped EN as well as her daughter with a variety of resources to continue practice following dismissal from therapy. The SLP emphasized to EN that progress can and may plateau, but it can often continue for weeks, months, and even years following stroke.
References


