What is aphasia?

Aphasia is a disorder that results from damage to portions of the brain that are responsible for language. For most people, these are areas on the left side (hemisphere) of the brain. Aphasia usually occurs suddenly, often as the result of a stroke or head injury, but it may also develop slowly, as in the case of a brain tumor, an infection, or dementia. The disorder impairs the expression and understanding of language as well as reading and writing. Aphasia may co-occur with speech disorders such as dysarthria or apraxia of speech, which also result from brain damage.

Who has aphasia?

Anyone can acquire aphasia, including children, but most people who have aphasia are middle-aged or older. Men and women are equally affected. According to the National Aphasia Association, approximately 80,000 individuals acquire aphasia each year from strokes. About one million people in the United States currently have aphasia.

What causes aphasia?

Aphasia is caused by damage to one or more of the language areas of the brain. Many times, the cause of the brain injury is a stroke. A stroke occurs when blood is unable to reach a part of the brain. Brain cells die when they do not receive their normal supply of blood, which carries oxygen and important nutrients. Other causes of brain injury are severe blows to the head, brain tumors, brain infections, and other conditions that affect the brain.

What types of aphasia are there?

There are two broad categories of aphasia: fluent and non-fluent.

Damage to the temporal lobe (the side portion) of the brain may result in a fluent aphasia called Wernicke's aphasia. In most people, the damage occurs in the left temporal lobe, although it can

result from damage to the right lobe as well. People with Wernicke's aphasia may speak in long sentences that have no meaning, add unnecessary words, and even create made-up words. For example, someone with Wernicke's aphasia may say, "You know that smoodle pinkered and that I want to get him round and take care of him like you want before." As a result, it is often difficult to follow what the person is trying to say. People with Wernicke's aphasia usually have great difficulty understanding speech, and they are often unaware of their mistakes. These individuals usually have no body weakness because their brain injury is not near the parts of the brain that control movement.

A type of non-fluent aphasia is Broca's aphasia. People with Broca's aphasia have damage to the frontal lobe of the brain. They frequently speak in short phrases that make sense but are produced with great effort. They often omit small words such as"is," "and," and"the." For example, a person with Broca's aphasia may say, "Walk dog," meaning, "I will take the dog for a walk," or "book book two table," for "There are two books on the table." People with Broca's aphasia typically understand the speech of others fairly well. Because of this, they are often aware of their difficulties and can become easily frustrated. People with Broca's aphasia often have right-sided weakness or paralysis of the arm and leg because the frontal lobe is also important for motor movements.

Another type of non-fluent aphasia, global aphasia, results from damage to extensive portions of the language areas of the brain. Individuals with global aphasia have severe communication difficulties and may be extremely limited in their ability to speak or comprehend language.

There are other types of aphasia, each of which results from damage to different language areas in the brain. Some people may have difficulty repeating words and sentences even though they can speak and they understand the meaning of the word or sentence. Others may have difficulty naming objects even though they know what the object is and what it may be used for.

GLOBAL APHASIA

Clinicians tend to "use the term global aphasia to label an aphasia with relatively equal parts receptive and expressive deficits, regardless of severity of deficit" (Collins, M.2005). In cadence of global aphasia seems to suggest that it is the most frequent occurring type of aphasia. Global aphasia is an extreme impairment or loss of language ability in all input and output modalities, meaning the individual has very poor language comprehension as well as the inability to speak or write. Persons with global aphasia are often present with an awareness of their surroundings, and their feelings can be interpreted from their facial or manual gestures. However, in terms of dealing with symbolic materials (e.g. writing, reading, listening, speaking, etc.) such persons exhibit extreme deficiencies (*Davis, 2000)*. The disorder of global aphasia is a callous type of language disorder, obtained by neurological injury.

Global aphasia differ from other types of aphasia in the sense that the lesion in global aphasia is not always restricted to cortical areas of the dominant hemisphere (left in most cases) but may extend to subcortical areas as well i.e. grey and white matter. This means that lesion in global aphasia may be; cortical, subcortical, or both. Also; since the site of the lesion in global aphasia is severe, one would think that any case with severe lesions is a case of global aphasia but this is not always the case. There are various singular cases "have been reported in the literature suggesting that such an extensive lesion may not be necessary to produce a global aphasia" (chapey Ed., 2001). Thus, we may infer that unlike other aphasias, the site of lesion in global aphasia cannot be considered a defining criterion.

Characteristics of this communicative disorder involves serious impairments in all aspects of speech and language. Such effects can result from [but are not necessarily limited to] large strokes, particularly lesions in the 'anterior-posterior' areas of the brain (*Ozeren et. al., 2006***)**. With an impairment of language in all modalities, global aphasia is the most severe type of the aphasias. Expressive or oral language is nonfluent, causing the person to be a single to

few word speaker. Utterances are frequently stereotypical orations, such as "oh my" or "how are you". Persons with global aphasia have a tendency to remain stuck or perseverate in both speaking and writing. They may write a letter over and over with the intention of writing their name, or repeat a word (i.e. "suitcase") when trying to communicate something else. Naming, repeating, and auditory comprehension are extremely impaired. It is believed that global aphasia specifically results from enormous lesions in the left perisylvian region of the brain ***(****Wallace, 1996*)**.**

Do other conditions accompany global aphasia?

Yes, particularly if the brain injuries extend beyond Wernicke's and Broca's areas. Accompanying conditions include *hemiplegia* (paralysis on one side of the body), *facial apraxia* (difficulty coordinating facial movements), and *emotional lability* (difficulty regulating emotions). *Depression* is another condition that is associated with global aphasia. Feelings of sadness may result directly from the brain injuries; they may also be a response to the loss of abilities.

Recovery from aphasia

The study of language functions recovery in aphasia is very important for patients and their family members as it is crucial for the clinicians who work with these patients. Since the study of language recovery is constantly changing, new data promoting all kinds of techniques and remedies keep accumulating, clinicians should always keep an ear open to studies issuing from the field. When it comes to individual patients, the ability to assess potential for recovery of language functions is of extreme importance not only for clinicians but also for patients and their families. Clinicians need extensive information about each patient so that they would be able to assign patients to the appropriate treatment programmes.

With that being said, it must be stressed that the study of language functions recovery in aphasia is not an easy task, especially in the early stages post-onset, for many reasons. First, the

neural mechanisms underlying recovery of function after brain injury are not completely understood. For example; in most patients, a certain degree of "spontaneous" recovery is expected in the following days/weeks after injury even if specific therapeutic interventions are not followed and maybe this is why it is difficult to diagnose and/or treat different aphasias immediately postonset. Second, in the study of aphasia there is a lack of animal model which places more challenges on specialists on the field. However, in recent years, thanks to modern scans (e.g. PET, and SPET) as well as other techniques.

Recovery of function in aphasia has been divided into two stages: an early stage and a late stage. The early stage is known by investigators as the first 1-3 months post-onset while the late stage is known as the months or even years post-onset. Spontaneous recovery seems to drop gradually by 6-7 months post-onset with little or no recovery after one year. Nevertheless, the degree of recovery can vary from one patient to another. One can never give up hope when it comes to brain damage though we know that once a brain cell is damaged it can never be regenerated but we also have reasons to believe that anything is possible. For instance, until recently permanent mentally vegetated patients had no hope of recovery. According to a report by Denise Cetta in CBS news, some mentally vegetated patients have sparked a nationwide debate when they spoke. One of the most interesting cases (in my opinion) in this report is the case of George Melendez who suffered from brain injury when he crashed his car. The doctors had told his mother, Pat Flores; that her son will never get better. Pat never gave up and kept nursing her son at home while looking for new treatments. One night her son kept moaning so she gave him a common sleeping pill (Ambien). Shortly, she noticed that the room got quiet and thought that the pill worked and her son slept, but when she looked at him she noticed that he was very much awake with his eyes wide open and was scanning the room! For the first time in five years, pat heard her son speak. Later, PET scans of George's brain before and after taking the pill showed remarkable brain activation of the language area. Actually, I personally consider

the fact that we do not yet have a thorough understanding of the brain and brain damage in general a blessing though many specialists tend to portray this point as misfortunate setback to their studies. My reason for saying this is that in most diseases case is generally considered closed, we rarely see any studies that recommend new remedies though we may hear of such diagnosis as an unusual case of so and so…what this "unusual" case is and why is it labeled "unusual case of…" instead of being separately dealt with remains an open question. Of course when it comes to recovery from aphasia one cannot really expect complete recovery (except in cases with mild and/or temporary aphasias such as anomic aphasia). Just like Pat puts it "I know I will never get the old George back". But better quality of life is the least that medical world should offer these patients.

Initial aphasia severity is the single most important factor for its impact on outcome. It is also important because of its interaction with other factors affecting recovery. Studies have suggested that patients with severe aphasias demonstrated a longer period of language recovery than patients with less severe aphasias. Another issue to consider is that the investigation of cases with different aphasias seems to suggest that the amount of recovery is dependent on the site and size of the area of the damage to language areas and consequently it varies according to the aphasia type. Also, it has been suggested that the right (unaffected) hemisphere plays an important role in aphasia recovery. However, the different conflicting data concerning recovery from aphasia tell us that there is no single factor alone that can predict outcome in patients with aphasia. For example, personal and biographical factors such as age, handedness, and gender have been studied but no clear evidence on their effects has been found (Chapey Ed.2001).

Although the future for recovery from global aphasia is not encouraging and many studies suggest that global aphasia may be the lowest on the scale of recovery among other aphasias. Data suggests that some global aphasic patients recover to become Broca's aphasics. Does this tell us that comprehension recovers more than production? If this is the case then why

most of the studies seems to suggest that chances for recovery from aphasia are better for Broca's patients rather than Wernicke's patients? Or is comprehension not restricted to Wernicke's area and presented in larger portion of the brain?

An important issue to consider when looking for improvements in patients with global aphasia is the significance of analyzing subsets of communication skills rather than looking at the overall scores to evaluate recovery from aphasia. For example, a study conducted in 1993 by Nicholas, Helm-Estabrooks, Ward-Lonergan, and Morgan on cases of sever global aphasia, gave different patterns of recovery for language and non-language skills following longitudinal administration of the Boston Assessment of Severe Aphasia (BASA), an instrument designed specifically to evaluate communication performance in sever aphasia (Chapey Ed.,2001). Again this seems to stress the point that in order to fully understand and deal with aphasia one should be very specific.

Decisions in the treatment of global aphasia may include decisions of: when to begin the treatment, how much to treat, how long to treat, what to treat, and when treatment should end. Rosenbek, LaPointe, and Wertz 1989 stress that: "Globally aphasic patients deserve treatment, and the treatment can be worth everyone's time. Verbal expression may not be realistic long-term goal for such persons, but short-term attempts to establish or expand it are a legitimate therapeutic activity for both acute and chronically globally aphasic people" (p.231). It should be clear by now that some form of treatment for global aphasia should starts as soon as the patient is able to participate because a good number of recent studies in the field seems to stress this point implicitly. With regards to how much to treat, there is a clinical intuition that more is better. In a study conducted by Denes, Perazzolo, Piani, and Piccione in 1996, globally aphasic patients were intensively treated (130 individulized sessions over a 6-month period). When compared with patients receiving regular treatment (60 sessions over a 6-month period), patients receiving intensive treatment showed a tendency to evolve to a more favorable type of

aphasia (mostly Brocas).Treatment in global aphasia should at least extend to 6 months postonset, but treatment should always be maintained at some level, sometimes the family continue to work with the patient with better skills than professionals. Further, the goals in the treatment of global aphasic patients should be as reasonable and attainable as possible especially for patients with severe global aphasia. These will help with choosing the right approach for treatment which in turn is of crucial importance in global aphasia (Collins, 2005).

In the last 6 years or so remarkable progress have taken place in treating global aphasia but future clinical research must further refine and specify the conditions under which treatment for global aphasia is mostly effective. This will enable specialists to manage care and resources more effectively and will help them to cope with financial pressures that constantly require them to select and limit their treatment to the best candidates i.e. the most promising cases of global aphasia.

References

AMO Bakheit, S Shaw, S Carrington, & S Griffiths. (2007). The rate and extent of improvement with therapy from the different types of aphasia in the first year after stroke. *Clinical Rehabilitation*, 21(10),941-949. Retrieved November 1, 2007, from ProQuest Medical Library database. (Document ID: 1372771051).

Basso, A., & Farabola, M. (1997, July). Comparison of Improvement of Aphasia in Three Patients with Lesions in Anterior, Posterior, and And Antero-posterior Language Areas. *Neuropsychological*

Rehabilitation, 7(3), 215-230. Retrieved November 26,2007, from Academic Search Premier database.

Brunswick, N., & Martin, G.N.(2006). The neuropsychology of language and language disorder. In G.N. Martin, *Human Neuropsychology* (2nd ed., pp.273-320). Pearson Education Limited.

Cappa, S. (2000, June). Neuroimaging of recovery from aphasia. *Neuropsychological Rehabilitation,* 10(3), 365-376. Retrieved November 26, 2007,from Academic Search Premier database.

Cetta, Denise. (2007, November 25). *Awakenings: Return to life* [Television breadcast]. MMVII, CBS Interactive Inc.

Chapey, R. (Ed.). (2001). *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders* (4th ed.). Lippincott Williams & Wilkins.

Collins, M. (1991).*Diagnosis and Treatment of Global Aphasia.* Singular Publishing Group, Inc.

Collins, M. (2005). Global aphasia. In L. LaPointe, *Aphasia and Related Neurogenic Language Disorders* (3rd ed.,pp. 186-198). Thieme Medical Publishers, Inc.

Crane, L.B., Yeager, E., & Whitman, R. L. (1981). *An Introduction to Linguistics.* Little, Brown & Company Ltd.

Ellis, Charles, Rosenbek, John C, Rittman, Maude R., Boylstein, & Craig A. (2005, Nov/Dec). Recovery of cohesion in narrative discourse after left-hemisphere stroke. *Journal of Rehabilitation Research & Development,* 42(6), 737-746. Retrieved November 26,2007, for Academic Search Premier database.

Hensel, S., Rockstroh, B., Berg, P ., Elbert, T. & Schonle, P. W. (2004). Left-hemispheric abnormal EEG activity in relation to impairment and recovery in aphasic patients [Electronic version]. *Psychophysiology,* 41(3),394-400. From Blackwell Synergy (10.1111/j.1469-8986.2004.00164x).

Kertesz, A. (1979). *Aphasia and Associated Disorders: Taxonomy, Localization, and Recovery*. Grune & Stratton.

Libben, G. (1996). Brain and Language. In W. O'Grady, M. Dobrovolsky, & F. Katamba, *Contemporary linguistics* (3rd ed., pp.416-437). Copp Clark Pitman Ltd.

Obler, L. K., & Gjerlow, K. (1999). *Language and the Brain.* Cambridge University Press. W. G. Webb, & R. K. Adler, *Neurology for the Speech-Language Pathologist* (5th ed.). Mosby Elsevier.

Selnes, O., & Hillis, A. (2000, December). Patient Tan Revisited: A Case of typical Global Aphasia?. *Journal of the History of the Neurosciences*, 9(3), 233-237. Retrieved November 26, 2007, from Academic Search Premier database.

Stefano Paolucci, Gabriella Antonucci, Luca Pratesi, Marco Traballesi, Sergio Lubich, & Maria Grazia Grasso. (1998). Functional Outcome in Stroke Inpatient Rehabilitation: Predicting No, Low and High Response Patients. *Cerebrovascular Diseases*, 8(4), 228-234. Retrieved November 1, 2007, from ProQuest Medical Library database. (Document ID: 668384391).

Zuchner, S, Kawohl, W, Sellhaus, B, Mull, M, Mayfrank, L & Kosinski, C (March 2003). A case of gliosarcoma appearing as ischaemic stroke. (Short Report). *Journal of Neurology, Neurosugery and Psychiatry*, 74, 3. P.364(3). Retrieved December 10, 2007, from General OneFile via Gale.