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The Effects of Left vs Right Hemisphere Cerebrovascular Accident, and Treatment

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The Effects of Left vs Right Hemisphere Cerebrovascular Accident, and Treatment

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Honors Research Project

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Abstract

This project takes an in depth look at the various methods of treatment for stroke patients, the results that are gained, and the possible benefits and detriments of each type of treatment when administered properly. It examines the definition of a Cerebrovascular accident (CVA), and the various symptoms that occur when the left versus the right hemisphere is affected. The different causes of strokes are taken into account, along with the wide range of ways the victims may be affected by it, physically and mentally. It is important to be familiar with the different methods of treatment for a patient who has suffered from a stroke, and to be able to differentiate between a left and right hemisphere limitation. Studying the causation of the impairment, and the possible psychological effects of it and certain types of therapy will help the therapist to determine which would be the best therapy approach for a particular patient, as each patient has a different comfort, motivation, and ability level. This project seeks to show the best ways to support both the patients and their loved ones as the patient overcomes their communicative restrictions.

Overview of the Anatomy of the Brain

The human brain is one of the most remarkable features of the body. It processes everything we think, feel, and sense, along with directing every muscle and organ with how to move in coordination with the rest of the components of the body so that it will function properly, and survive. Taking a closer look at the brain, how it functions, and when some of the components malfunction, one can get a better glimpse of what causes neurological speech problems such as Aphasia. When one knows what the cause of the problem is and where it originates, then one can better approach the treatment successfully.

The brain is divided composed of three features, the cerebrum, the cerebellum, and the brain stem. We will be focusing on the cerebrum, which is the biggest component. The cerebrum is divided into two hemispheres, the left and the right. The left hemisphere is responsible for logic type skills such as mathematics and scientific thinking, as well as controlling the right side of the body. The right hemisphere is responsible for more creative skills such as art, as well as controlling the left side of the body. The hemispheres are connected by the corpus callosum, which in addition to holding the brain together, also lets the two hemispheres communicate with each other sensory information, memories, and knowledge. (LaPointe, Murdoch, and Stierwalt)

Each hemisphere of the brain has several lobes, or areas, that correspond with specific mental functions, or senses. The frontal lobe is located in the foremost part of the brain, and is the location of the pre-central gyrus, which controls all voluntary muscle

movements. It also houses Broca's area in the left hemisphere typically (but occasionally can be found in the right hemisphere). The parietal lobe is on the top of the head, and houses the sensory cortex. The occipital lobe is in the back of the head, and is the center of activity for vision. The temporal lobe is on the sides of the head, and is the location of Wernicke's area, which is where sound waves from the ears get processed into intelligible speech. When these areas are compromised, there are serious consequences in the speech and language abilities of the brain. (LaPointe, Murdoch, and Stierwalt)

Etiology of Cerebrovascular Accidents

A Cerebrovascular Accident, commonly referred to in the past as a stroke, is defined as a blockage of blood flow or a break in an artery that results in brain cell death due to lack of blood and therefore oxygen. The damage can be either focal or diffuse, meaning only one small area is affected, or there is widespread damage throughout several areas, affecting the patient in a variety of ways depending on where the damage is located in the brain, and the extent of the damage. If the Cerebrovascular Accident is an ischemic stroke, or caused by a blockage in a vein, then the damage will be localized in that particular area of the brain and only the functions of those brain cells will be affected. If the Cerebrovascular Accident is a hemorrhagic stroke, or a broken artery, then the internal bleeding could affect more areas around the original area of rupture and more bodily functions would suffer. (LaPointe, Murdoch, and Stierwalt)

Occasionally a patient can experience a Transient Ischemic Attack one or several times before they experience a significant Cerebrovascular Accident. A Transient Ischemic Attack is a temporary blockage or cease of blood flow to the brain that is quickly dissolved naturally. There is usually brain damage from a Transient Ischemic Attack, however if it is significant, the brain quickly repairs it and the body's function returns to normal. Since this is seen as a full recovery, and often the Transient Ischemic Attack is undiagnosed or unreported to medical professionals, the patients and their families are unaware that this is a warning sign of a bigger threat that could occur soon after if the cause of the Transient Ischemic Attack is not addressed and quickly. (Carlin)

A Transient Ischemic Attack or a Cerebrovascular Accident can both be caused by many pre-existing factors. If a patient has Diabetes, heart disease, or high blood pressure, these are all going to raise their risk of having a Cerebrovascular Accident. Smoking or drinking in excess will also raise their risk of having a Cerebrovascular Accident. Some risk factors are unavoidable, as some patients have a long family history of Cerebrovascular Accidents, Transient Ischemic Attacks and other related health problems. The older a patient gets, the higher their risk. If they have previously had problems such as brain aneurysms or arteriovenous malformations, then they are already predisposed to problems with blood flow in the brain. (Carlin)

Severity of Cerebrovascular Accidents

There are many factors that contribute to how severely the patient is affected by their Cerebrovascular Accident such as the location of the damage, amount of brain cell

damage, age, and handedness (whether the patient's dominant hand is the right or the left). The older a patient is, the less likely it is that they will be able to completely regain normal functioning if there is a lot of brain damage. A younger brain has more plasticity and the capacity for other cells to take over the function of the cells lost where an older brain might not be able to recover or replace all cells lost. Handedness can sometimes affect a patient's brain's ability to compensate for losses. If a patient is left handed, their brain may be able to relocate some functions, or they may not be losing a lot of the areas that a right handed person would have in that location in their brain. (LaPointe, Murdoch, and Stierwalt)

The amount of time the brain is deprived of oxygen will be an important indicator of how much damage can be expected. If there is internal bleeding, then the longer it continues, the more pressure will build up in the skull, causing more cells to suffocate to death essentially. The longer the brain is blocked from the oxygen rich blood, the more brain cells will die from lack of oxygen. When there is a blocking of blood flow to a certain part of the brain, the body will react in certain ways.

Symptoms of A Cerebrovascular Accident or Transient Ischemic Attack

One experiencing a Cerebrovascular Accident or Transient Ischemic Attack may feel numb or weak in their face, arm or leg, especially on one particular side of the body. They may become confused as to where they are or who they're with, and have trouble

speaking or understanding. They may have blurry vision, or dizziness and loss of balance or coordination. They may have a headache as well. (“Learn More Stroke Warning”)

Some of these symptoms may not be immediately recognized as an important concern, if it is only one or two of these symptoms. This is why it is so important for older and more at risk patients to know the signs of stroke and to immediately call 911 or go to a hospital if they suspect any of the symptoms are occurring in themselves or a loved one. Brain cells begin to die as soon as four minutes after being deprived of oxygen (LaPointe, Murdoch, and Stierwalt). Patients often do not realize how much damage can be done in so little time by a cerebral vascular blockage or hemorrhage. A Cerebrovascular Accident can affect the brain in multiple ways in the left and right hemisphere, and the therapy methods administered will depend on the severity and the location of the damage.

Right Hemisphere Syndrome

Location is another important indicator of what problems a patient will have and therefore what rehabilitation they will need. When a Cerebrovascular Accident damages the right cerebral hemisphere of the brain, the patient may experience Right Hemisphere Syndrome. The right hemisphere of the brain deals with personality and executive functioning, when it is damaged, the patient can experience problems with decision making, planning, processing emotions, problem solving, memory and attention. Friends and family of the patient may notice personality changes such as irritability, lack of proper social cues or body language, flat emotions or inappropriate emotional reactions.

They have trouble recognizing emotions in others as well. Visual perception is uniquely affected. They cannot perceive and therefore do not respond to anything in the left field of vision. Many times, someone with Right Hemisphere Syndrome will not even realize that they have sustained any serious developmental problems, which can hinder the rehabilitation process. (LaPointe, Murdoch, and Stierwalt)

It is important to note that when a Speech Pathologist encounters a patient who may have Right Hemisphere Syndrome, they need to use tests that assess the function of the right hemisphere specifically, in order to tell if damage was done and how severe it is. These tests are different from the tests given to patients who have had a left hemisphere Cerebrovascular Accident in that they look for the ability to answer open ended questions, focus or concentrate on one task at a time until completed, write, problem solve, and most importantly, how much of their left visual field they can see or recognize. Once the deficit is established, the therapist can build the patients abilities off of their remaining functional strengths. (Carlin)

Aphasia

The left cerebral hemisphere of the brain is the part of the brain that controls language in the majority of people, so if that is where the Cerebrovascular Accident occurs then they will most likely need speech therapy, as well as possibly swallowing therapy or physical therapy for the right side of the body. Broca's area is in the left frontal lobe of the brain. It helps the brain formulate and produce speech or language messages. Wernicke's area is also in the left hemisphere in the temporal lobe, which

processes and deciphers meaning from language that is heard. If even one of these two is damaged, or the brain tissue near one of these areas, there can be serious complications in the patient's road to recovery.

When Broca's or Wernicke's area is damaged by cell death in a CVA, this causes Aphasia. Aphasia is an acquired impairment of language that negatively impacts the production and understanding of spoken and written communication. There are several different types of aphasia one would see as a Speech Language Pathologist. Broca's aphasia, where the damage is primarily in Broca's area, Wernicke's aphasia, where the damage is primarily in Wernicke's area, or global aphasia, where there is damage throughout the brain affecting both language-producing centers. (Carlin)

Broca's aphasia affects a person's expressive language skills. Their intelligence is not at all affected by their condition, they just have difficulty composing a message and being able to get that message conveyed clearly. The patient may speak in short, choppy sentences, they may not be grammatically correct, and they may need more time to process a message and articulate it or may have troubling thinking of a word or how to form it physically. Since the patient is spending so much time concentrating on finding and producing the words they are looking for, they often will have a flat tone of voice with little inflection or prosody, and with frequent pauses. It is classified as non-fluent aphasia, meaning the patient is not able to clearly and quickly articulate their messages. (Carlin)

Wernicke's aphasia damages the part of the brain that processes auditory information. It is classified as fluent aphasia. The patient does not have trouble sending messages or putting them together, they just struggle to understand what him or herself or

anyone else is saying. The patients' sentences they can put together will have the normal prosody and flow of language, but they tend to have jargon or nonsense words mixed in. They cannot process their own speech along with everyone else's, so they do not know that their own words are not making sense either. (Carlin)

Global aphasia occurs when there is profuse damage throughout the brain affecting all language producing and comprehension areas. The patient will have trouble speaking and comprehending spoken language as well as trouble with reading and writing. They will most likely be non fluent as they will have trouble speaking or understanding more than a few words at a time. Even if the patient is severely compromised, they still may be able to say words or phrases that come to them automatically through a surprised or emotional reaction, or that have been used repetitively throughout their lives such as their name, address, counting, or singing a song. (Carlin)

Aphasic patients may also have other problems that are not directly language oriented. Aphasia is a language disorder that inhibits a patient's ability to communicate or understand symbols as well. Patients may have trouble understanding what road signs mean, doing math and remembering what amounts which numbers stand for, or if they used to play an instrument they may not be able to read music any longer (LaPointe, Murdoch, and Stierwalt). Since Aphasia so completely infiltrates a person's life and livelihood, it is important for the therapist to go into a treatment with the objective of rehabilitating the abilities that the patient most wants or needs for their quality of life to return to normal. With a cognitive functioning issue like Aphasia, the possibility of a patients language and communication skills going completely back to normal may be

low, but the therapist can take the patient's strengths and use those to find ways to compensate for the abilities lost so that the patient can continue to go about their day to day life with the quality of life that they had before.

Life Review Therapy

The Life Review Therapy method postulates that since the majority of older patients are already going through this mental journey, therapists could guide them through this process and ease their anxiety or stress. Davis formulated a study that would examine the effects of Life Review Therapy on individuals who had recently experienced a Cerebrovascular Accident, specifically. Since many of the individuals who have experienced a Cerebrovascular Accident are older patients, they may already be going through a life review process because of either their age, or the recent life change of a Cerebrovascular Accident. The study looked at the difference in both depression and life satisfaction rates in the control and experimental groups.

There were 14 total participants, randomly assigned to control or experimental groups. The control group, in 3 separate 1-hour sessions, was shown various informative movies and then engaged in discussion about the content. The experimental group was given Haight's Life Review and Experiencing Form, in 3 separate 1-hour sessions. The questions on this form inquired about experiences from all different ages, early childhood, adolescence, teenage years, early and late adulthood. It asked about regrets, and proudest moments as well.

Following the third and last session, the patients were given two tests, the Life Satisfaction Index, form Z, and the Zung Scale for Depression. The experimental group was found to have significantly higher scores on the Life Satisfaction Index, and also to have significantly lower scores on the Zung Scale for Depression after going through 3 Life Review Therapy sessions.

This method is not designed strictly for Speech Language Pathologists to administer, but it could most definitely be used by a Speech Pathologist to encourage speech in conjunction with other therapy methods. It is also important to note that recently after experiencing a Cerebrovascular Accident, patients are prone to depression, anxiety, and feelings of worthlessness, helplessness or inadequacy due to their new limitations on communication or mobility. This method seeks to eliminate those feelings or dampen them, by focusing on the high points, and triumphs of ones life, resulting in an overall feeling of satisfaction when looking back at ones life. While this study did not look to rehabilitate the patient's speech and comprehension specifically, it did aim to help them regain their previous quality of life, which is the goal of any type of therapy or rehabilitation.

Constraint Induced Language Therapy

Constraint Induced Language Therapy is a technique developed to help patients with Aphasia, specifically recently after acquiring the language problem. It focuses on teaching the patient how to isolate their verbal abilities to request items that are necessary for day-to-day life, rather than relying on the use of gestures, or any other mode of

communication that may be unclear to the caretakers. One reason this study was done on patients, who had recently acquired Aphasia, is so that they could train the patients to use their verbal language skills while they could still recover as much of their previous function as possible. It is a concern of many therapists that recovering patients, if they can get by with grunts or gestures, or some other mode of communicating, that they will rely on that rather than verbal communication, and that they will thereby lose some of those verbal abilities as a result.

This particular study, conducted by Kirness and Maher, aimed to isolate the patients' verbal communication skills so that they would not be lost or fall into disuse during the recovery period. They did intensive therapy sessions aiming for 3 hours of therapy a day. Due to the patients other obligations with physical therapy, these sessions were sometimes limited by the patients ability to continue through their fatigue. The sessions involved two communication partners, either the patient and another patient, or the patient and the Speech Language Pathologist. There were interactive flash cards and a board between the two communication partners, preventing them from seeing one another and therefore preventing the one communicating from using any method to indicate an answer besides verbal.

The results of this study were positive for each of the 3 individuals examined, however there was not a control group to compare those who went through the therapy sessions to. It could be argued that the majority of the progress made by the patients was due to spontaneous recovery rather than the therapy, but the fact that the patients who had ischemic strokes had a better recovery rate than those who had had hemorrhagic strokes (usually hemorrhagic stroke patients tend to have a better prognosis for recovery) led the

researchers to believe that the therapy had indeed been the salient factor in recovery. The patients improved by 5.1%, 18.7%, and 23.3% respectively from their baseline scores when tested on repetition and naming (Kirmess and Maher). When they were tested on receptive tasks or written tasks they did not show much improvement if any, however, Constraint Induced Language Therapy only focuses on verbal output from the patient, not written.

Since Constraint Induced Language Therapy has only been introduced in 2001, it is a relatively new technique. There are a lot of studies that have explored its use, but not a lot of definitive knowledge about its effectiveness, and how effectiveness varies related to the patients' condition or the intensity of therapy. An Evidence-Based Systematic Review was done by Cherney, et al to determine what Constraint Induced Language Therapy has to offer to therapists and patients. They started by searching through all studies that had been published and peer reviewed from 1990 to 2006, among other criteria.

A strictly evidence based review is unbiased, and prohibits any study from being included that has questionable practices or results. The validity and reliability of all of the studies done on Constraint Induced Language Therapy was evaluated carefully, and out of all of the studies found, only 10 were admissible. Those 10 studies were examined to see how many hours of therapy were administered, the previous state of the participants, the conditions of the study, and how much improvement was shown by the participants. An Effect Size was given to each study, determined by the individual improvements made by the participants in that study, and based off of the ability of the study to answer the clinical questions that were set forth by the authors.

Each study was evaluated for effectiveness and was given a score out of either 8 or 9 total markers of effectiveness. The studies ranged from 3 to 6 out of 8 and 5 to 7 out of 9. The combined results of all of the studies examined in the Evidence-Based Systematic Review showed that patients with chronic aphasia who underwent Constraint Induced Language Therapy sessions improved their scores on the tests for aphasia. They improved in word naming skills, receptive skills, and repetition.

There was one study that experimented with giving the patients and the family or caregiver's developmental exercises and activities for the patient to do at home, outside of the therapy sessions. This did not improve that group of patient's skills any further than the others that did not have those options at their disposal. That may be because of the lack of interest in those activities on the part of the patient or the caregivers, not enough time devoted to it outside of the regular therapy sessions, or just the fatigue of the patient. If the family or patient has interest in working outside of the therapy room, then it stands to reason that as long as they had the stamina and the time to work on it that they would improve their skills and better retain what the therapist was emphasizing, as long as the activities were being demonstrated correctly. Overall, Constraint Induced Language Therapy has been shown to significantly impact the patient's abilities in a positive way.

This therapy method is a valuable tool for those patients that are attempting to return to their lives independent of a full-time caregiver or aid. If a patient is seeking to continue independent living after experiencing a Cerebrovascular Accident, they need to be able to communicate verbally to those they come in contact with. Paper and pencil are not always readily available and gestures are not a reliable way of communicating. This

method of therapy is still very relevant to those living with caregivers or who have visiting aids. These Speech Therapists used flash cards with helpful words necessary for every day life in this study, to promote the patients independence. If the patients can correctly produce those words verbally when needed, it will save the caregivers and patients a lot of frustration and help the patients to maintain their independence for as long as possible.

Cued Picture-Naming Treatment for Anomia

Speech Therapists have a difficult task to do, and not an exceeding amount of time with which to do it. They have to decide on the intensity and duration of therapy sessions. If they are not intense enough, then the patient will not make progress, or at least will not make it quickly enough. If they make the sessions too intense, then the client will soon tire either mentally or physically and will not be able to complete the sessions. One of the goals of therapy is to have a large enough number of therapy sessions that are intense enough that the client has the abilities either ingrained in their mind, or that they will have the behavior patterns memorized to the point that the motor pathways are reflexive, and they do not have to consciously work to achieve that outcome even after therapy ends.

Since therapists are looking for ways to increase the intensity of a therapy session without increasing the length of time a client spends there, a study was done to investigate how long it took each individual to experience a successful change in their ability to name pictures presented in therapy sessions (Harnish, et. al). They presented 50

pictures to the client 8 times during 1 hour of treatment, and they gave the client cues to help them name the picture. This was repeated four times weekly, but only for 2 weeks.

The purpose of this study was to give evidence as to how much intensity was needed in therapy for Aphasic patients to be able to retain picture-naming skills without increasing the amount of time spent in therapy sessions. The repetition of the tasks, and going over the pictures so many times in the therapy sessions engrains the motor pathway necessary to speak the word that describes the picture almost second nature. The higher number of times someone says a word or phrase, the more easily the movement will come each succeeding time. By repeating each picture so many times in such high intensity therapy sessions, the study hoped to find how quickly an Aphasic patient can regain the ability to more easily speak a multitude of vocabulary words. In order to see if the subjects' abilities to name were limited only to the picture cards practiced in therapy, there were also picture cards that were not practiced that they were tested on both before and after the treatment was completed.

Six out of the eight participants achieved significant increases from their baseline ability after the first session, and the other two participants had significant increases from their baseline ability after the third session. Only seven of the original eight participants were followed up with two months after the trials. Six of the seven had retained the skills gained from therapy for at least two consecutive follow up tests. As far as the testing on the pictures not included in the therapy sessions, two of the seven clients that participated showed significant improvement from their baseline, showing that some picture naming skills had been generalized for them.

When a patient is able to improve their skills on the specific items trained on in therapy sessions, that is a successful treatment. When the patient is able to generalize the information or skills learned in therapy and apply it in other areas or in other ways then that treatment will be useful to them in multiple situations and for much longer after treatment has ended. Results depend heavily on how severe the patient's disorder is and how severely it affects their life, but the higher the intensity of the treatment, the more likely a patient is to retain the information and the skills if it is administered correctly and they are not easily fatigued.

Response Elaboration Training

Response Elaboration Training is another type of treatment for patients with aphasia. In this approach, the therapist attempts to make the therapy sessions as much like interactions would be naturally, if not prompted. This approach is a much less stressful environment for the patient, because rather than most picture cued therapy sessions, there is no 'right' or 'wrong' response (Wambaugh, Nessler, and Wright). The therapist produces a picture card, and the patient makes a statement about whatever is pictured on the card. The therapist then begins a conversation with the client, entirely based off of what the client's responses are. It is a natural discourse between the two, and the client practices repeating the target word multiples times during each guided conversation.

In this particular study by Wambaugh, Nessler, and Wright, they wanted to see if the same results could be achieved from response elaboration, but rather than using picture cards to guide the topic of the conversations, they allowed the clients to tell

personal narratives, and they pursued further elaboration from what the client told. For the first part of the therapy sessions they would ask open-ended questions about what the client would do in a certain every day situation to give them the chance to talk about something they were familiar with. Then the therapist would ask if there was anything they wanted to talk about, such as a book they were reading, or their grandchildren coming to visit. If the client was interested and engaged in the subject being talked about, then they would be more willing to participate. These therapy sessions were conducted either at home or in the laboratory according to which the patient was most comfortable with.

They measured the results in correct information units, and information units. There were only three participants, but all three participants had a much higher increased rate of information units, and correct information units. The percentages of correct information units after treatment compared to the baseline for the first treated procedural set went up for the first participant from 48.9% to 63.9%, and for the third participant from 59.2% to 68.1% (Wambaugh, Nessler and Wright). There was an increase in the amount of words that were used that were defined as 'novel' by the researchers, meaning that not only did the amount of words used increase, but the speakers were exploring using a wider vocabulary at the end of the treatment as well. Since this was a very small group, no mass conclusions should be drawn, but one can gather from this that when clients are in a comfortable environment and encouraged to engage in conversation about subjects that are important to them, they may just open up and strengthen their speaking skills along with their vocabulary.

Semantic Feature Analysis

Another study done by Wambaugh, et. al, investigated Semantic Feature Analysis, and attempted to generalize the results with the clients. What Semantic Feature Analysis does is it reinforces in the client's mind all of the different ways they can categorize that object, person, place or thing, so that the next time they are trying to retrieve that word, they have a multitude of words to describe it that can trigger the response of the target word. A therapist sits down with a client, and they go through picture cards. Rather than moving on to the next card when the client correctly names the item in the picture, the therapist goes through all of the ways the item pictured can be categorized or recognized so in the future they can more easily retrieve the word they want to say. This study postulated that if a client is familiar with the semantic groups surrounding the target words practiced in therapy sessions, then they should also be able to name target words not practiced in therapy sessions that were in the same semantic groups.

There were four categories of practiced words total. Two categories had plants and animals in them, with 26 words each. The other two categories had inanimate objects in them, also with 26 words apiece. All of the participants showed great improvement in ability to name the words that had been practiced in the therapy sessions, but they were not able to generalize the results and name other objects or items that had not been practiced in therapy.

Generalization is an important skill for clients to grasp. If they are able to take what they learn in therapy sessions and apply it in their every day life and conversations,

then they will be able to acclimate themselves to speaking in any situation or conditions. Semantic Feature Therapy has the potential to help clients learn to generalize objects or words in the same categories, but it would need to be administered with the necessary intensity, and to clients that had the cognitive capability of generalizing those large categories.

Multimodal Communication Program for Aphasia

Wallace, Purdy, and Skidmore devised a treatment method called the Multimodal Communication Program for Aphasia (MCPA). They had noticed that not many treatment plans for aphasia are implemented and studied during the acute stroke phase. Since the first month or two after a stroke occurs is the time when the brain is most actively trying to repair damaged neurons and connections, this is the time when therapy should be focused on. This would give the patient the highest chance of recovering the skills lost, or as much as can be recovered. They state in their introduction that a patient who is in the immediate recovery stage of their Cerebrovascular Accident and begins undergoing therapy will have a different outcome than someone who had a Cerebrovascular Accident several months ago and is in the process of treatment.

Two adults with severe aphasia were studied for the 3 weeks immediately after they experienced a Cerebrovascular Accident. This therapy model that was used was modeled after Multimodal Communication Training, which focuses on teaching patients how to integrate writing, drawing, and gesturing into conversations to bridge the communication gaps that come up. This in turn helps to exercise their executive

functioning skills as well since they need to decide when another mode of communication is necessary and which mode to use.

There was a major difference between the two patients, and between the results achieved by both of them. Patient 1, during the baseline assessment, did not often initiate switching of the mode of communication (only 13.33% of the time) if the one attempted was not conveying the message accurately. In the post intervention check up, 3 months following the Cerebrovascular Accident, she demonstrated the ability to initiate communication via a different modality 75% of the time, and she was able to accurately produce a target concept each time one was presented (Wallace, Purdy, and Skidmore).

Patient 2 did not have such a drastic change in communicative behavior. The individual primarily relied on spoken communication in the baseline and the post intervention checkup. The patient only used gestures when necessary to answer a question on the evaluation. Even though the patient did not initiate or attempt switching at all during the assessment, it was exhibited that when gesturing was necessary, that mode of communication was more accurate than during the baseline examination.

This observation only included two patients, and obviously more research would need to be done in this method of therapy before coming to a definitive answer as to if this is effective or not. What one can glean from this however is that patients with aphasia often have trouble initiating speech, or any form of communication. If the therapy sessions focus on helping them discover when another form of communication is necessary, and how to go about switching modes or which mode would be appropriate or necessary depending on the environment or the communication partner, then the patient

will more easily be able to see how they best can communicate if their original mode is unsuccessful.

Speech Music Therapy for Aphasia and Apraxia of Speech

Many individuals have been involved with music at some point in their life, whether it be choral, theatrical, orchestral, or just singing along to songs on the radio. Many people find it easier to remember tasks, numbers, instructions, or other important bits of information when it is sung to a tune. This is the basis of a method called Speech Music Therapy for Aphasia, and Apraxia of Speech. It incorporates speaking with a melody with the purpose of helping those with Aphasia and Apraxia to be able to produce target words or sentences more easily by remembering the tune they were sung to.

In the therapy sessions, the clients and therapists choose target words, phrases, or sentences that are used in every day situations. The therapist demonstrates the target utterance in a singsong voice, giving the client a tune to follow when they repeat the utterance each time. When the client is focusing on the tune, they may more easily be able to repeat the desired word or phrase, and the motor pattern may come more easily to them. After repeating the desired utterance a set amount of time, and when the client is showing more ease in the repetition of the task, then the amount of singing or difference in pitch during the phrases is reduced and eventually eliminated in order to use in daily situations. The patient will more easily be able to produce the target utterance since now the motor pathways are habitual, and they will not have to struggle so much to produce

typically used sentences in public places. This will ease their comfort when interacting in with others in public, and increase their quality of life.

Joost Hurkmans, et al. decided to do an in depth look at the effects of this type of therapy on 5 clients with Aphasia and Apraxia of Speech. In this particular study the subjects were given 24 Speech Music Therapy for Aphasia sessions, with an intensity of thirty-minute sessions, twice a week. They were tested with the Diagnostic Instrument for Apraxia of Speech before, during, and after treatment up to three months after their last therapy session. The results were that all of the patients improved in intelligibility. 4 out of the 5 patients increased in diadochokinesis and articulation. Once the therapy had ended, the patient's scores did not decrease, they remained the same. They were able to retain what they had been working on in therapy even after they were not rehearsing the target phrases with therapists any longer.

The authors of this study came to the conclusion that Speech Music Therapy helped at least 3 out of the 5 participants. They observed that the patients were not only achieving better results on their tests than they did on the baseline, but that this would mean that they were functioning better in the world outside the therapy room. Since the phrases in therapy that are being practiced are those that would be used for example in a grocery store, bank, or running errands, if the patients are able to memorize a motor pattern to be able to quickly and easily produce these sentences they will be using most often then they can more smoothly be able to communicate what they need to with the general public, easing a lot of social and mental anxiety. The longer a patient participated in Speech Music Therapy, the more phrases they would be able to add to their list that

they were comfortable with and had memorized the specific motor pattern to since they had gone over it with a therapist so many times.

When they are practicing using a certain phrase for each setting in public, which will make it easier for them to get over their anxiety about being able to ask where the restroom is or another simple question like that. When they practice saying that phrase set to a musical melody, that gives them practice with adding some prosody and pitch changes to their voice as well, which the majority of patients with Aphasia or Apraxia are lacking since they have to concentrate so hard on thinking of what to say and how to say it. If the phrase is able to come to them automatically then their other markers of speech will come more naturally as well.

Assessing Communications Therapy in the North West

A study was done where two groups were given various types of interactive therapy, both with a speech language pathologist, and with a visitor, who would engage the patient in interactive rehabilitative activities, but in a way that the patient did not know they were actively being given therapy treatments. This is a type of study known as ACT NoW, or Assessing Communications Therapy in the North West (Young). Both the results, and the patients' reactions to the activities were observed. The purpose of this study was to assess if the purposeful therapy approach worked best for the patient overall and if early, focused interaction with those who had recently suffered from a Cerebrovascular Accident could improve the recovery or assist in spontaneous recovery. They also looked to answer the question that if patients had early, focused interaction

soon after experiencing a Cerebrovascular Accident with a person that was not a speech pathologist, would they still experience those improved language skills they might gain from therapy?

This was both randomized and a controlled trial. The speech language pathologists working with the patients gave them a battery of activities for those struggling with aphasia and dysphasia. They worked with flashcards and picture boards if necessary for the patient to communicate with people. They aimed to improve memory that was remaining and to rebuild the lost vocabulary or language skills.

The other group of participants was not seen by speech pathologists for rehabilitation sessions. There was a group of people that were trained by the researchers and speech pathologists that administered the same amount of time and attention to the patients in their group, just in a different way. These participants were not aware that they were receiving any type of therapy indirectly or directly. The visitors that came in interacted with them in a way that would engage their minds in seeking and retrieving activities to build memory, and vocabulary, while making it seem as though they were merely holding a casual conversation.

The study did not show any results that would determine that beginning communication therapy earlier would improve the mental or cognitive skills beyond those that would normally be achieved from spontaneous recovery of the patient with the exception of improving attention skills. Another study was done on the results of this, looking into the qualitative results of the patient's experiences with the therapists versus the trained visitors that contributed to the study.

While the majority of the patients enjoyed their therapy and their time spent with the speech pathologists, there were a few that did not feel encouraged, did not feel that the therapist had a positive attitude, or that they made much, if any, progress during the therapy sessions. The group that experienced the visits from trained visitors felt that they were making progress on their own (since they were not aware of the specifically directed activities), and were encouraged by this sign of improvement in their condition. They felt that the visitors always had an upbeat, positive, encouraging attitude, which in turn always lifted the patient's spirits and improved their mood (Young).

The important point of patient service to be taken from this study is that human interaction is not going to be enough to improve the patients mental or cognitive state on its own, unless that person is trained in how to indirectly administer therapy activities. While the patients may not always want or feel like they need therapy sessions, the reasons they may feel adverse to them could be because of the attitude, mood, or lack of encouragement and sense of progress from the therapist.

It is critical for the therapist to be a positive motivator for their patients. The patients should leave sessions feeling accomplished, like they are improving, even if only by small steps. A therapy session should lift their spirits, not make them feel hopeless, or like they are losing a battle with their own mind. If the therapist lifts their confidence in themselves and encourages them and shows them the progress they have made, it will have a much better impact on the patient's entire sense of self worth. They will have hope that they will improve, that they are improving, and have that sense of purpose and motivation that we strive to provide.

Conclusion

A Cerebrovascular Accident can affect the brain in multiple ways in the left and the right hemisphere, and what type of therapy is administered to them depends on the location and severity of the damage. Some therapy principles are universal. The most important thing a therapist can do for their patient is to make them feel like they are a person first, rather than a handicapped person first and foremost. These patients, whether young or old, are struggling with their sense of self worth and frustration that their abilities have been reduced to a fraction of what they were before the Cerebrovascular Accident. When the therapist addresses the mental and emotional needs of the patient as well as the physical then the patient can become fully recovered, use their remaining abilities to successfully communicate, and come to terms with who they are as a person with a speech or language problem. This is the goal, as a Speech Language Pathologist: to enable the patient to have a positive outlook on their life and future with their speech or language disorder, and to give them the tools they need to help them to regain their quality of life.

References

Carlin, Charles. "Aphasia." Organic Disorders, The University of Akron. Akron, Ohio. Mar. 2016. Lecture.

Cherney, Leora R., et al. "Evidence-Based Systematic Review: Effects Of Intensity Of Treatment And Constraint-Induced Language Therapy For Individuals With Stroke-Induced Aphasia." *Journal Of Speech, Language & Hearing Research* 51.5 (2008): 1282-1299. *Academic Search Complete*. Web. 26 Mar. 2016.

Courville Davis, Marsha. "Life Review Therapy As An Intervention To Manage Depression And Enhance Life Satisfaction In Individuals With Right Hemisphere Cerebral Vascular Accidents." *Issues In Mental Health Nursing* 25.5 (2004): 503-515. *Academic Search Complete*. Web. 23 Mar. 2016.

Harnish, Stacy M., et al. "Dosing Of A Cued Picture-Naming Treatment For Anomia." *American Journal Of Speech-Language Pathology* 23.2 (2014):S285-S299. *Academic Search Complete*. Web. 18. Apr. 2016.

Hurkmans, Joost, et al. "The Effectiveness Of Speech-Music Therapy For Aphasia (SMTA) In Five Speakers With Apraxia Of Speech And Aphasia." *Aphasiology* 29.8 (2015): 939:964. *Academic Search Complete*. Web. 17. Apr. 2016.

Kirmess, Melanie, and Lynn M. Maher. "Constraint Induced Language Therapy In Early Aphasia Rehabilitation." *Aphasiology* 24.6-8 (2010): 725-736. *Academic Search Complete*. Web. 24. Mar. 2016.

LaPointe, Leonard L., Bruce E. Murdoch, and Julie A. G. Stierwalt. *Brain-Based Communication Disorders*. San Diego: Plural Publishing, 2010. Print.

"Learn More Stroke Warning Signs and Symptoms." *American Heart Association*.

American Heart Association, 16 Oct. 2015. Web. 18 Apr. 2016.

<http://www.strokeassociation.org/STROKEORG/WarningSigns/Learn-More-Stroke-Warning-Signs-and-Symptoms_UCM_451207_Article.jsp#.VxVjsvkrLIU>.

Schow, Ronald L., and Michael A. Nerbonne. *Introduction to Audiologic Rehabilitation*. 6th ed. Boston: Pearson, 2013. Print.

Wallace, Sarah E., Mary Purdy, and Elizabeth Skidmore. "A Multimodal Communication Program For Aphasia During Inpatient Rehabilitation: A Case Study." *Neurorehabilitation* 35.3 (2014): 615-625. *Academic Search Complete*. Web. 14 Mar. 2016.

Wambaugh, Julie L. Christina Nessler, and Sandra Wright. "Modified Response Elaboration Training: Application To Procedural Discourse And Personal Recounts." *American Journal Of Speech-Language Pathology* 22.2 (2013):S409-S425. *Academic Search Complete*. Web. 18 Apr. 2016.

Wambaugh, Julie L., et al. "Semantic Feature Analysis: Incorporating Typicality Treatment And Mediating Strategy Training To Promote Generalization." *American*

Journal Of Speech-Language Pathology 22.2 (2013): S334-S369. *Academic Search Complete*. Web. 18 Apr. 2016.

Young, Alys, Timothy Gomersall, and Audrey Bowen. "Trial Participants' Experiences Of Early Enhanced Speech And Language Therapy After Stroke Compared With Employed Visitor Support: A Qualitative Study Nested Within A Randomized Controlled Trial." *Clinical Rehabilitation* 27.2 (2013): 174-182. *Academic Search Complete*. Web. 3 Apr. 2016.