Suggested APA style reference: Bennett, E. D., & Smith, J. N. (2011). *Neurology for smarties: Symptom recognition, referral, and support*. Retrieved from http://counselingoutfitters.com/vistas/vistas11/Article_57.pdf

Article 57

Neurology for Smarties: Symptom Recognition, Referral, and Support

Paper based on a program presented at the 2011 American Counseling Association Conference, New Orleans, LA, March 2011.

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According to the World Health Organization (2007) up to one billion people are affected by a neurological disease annually worldwide constituting 6.3% of all diseases. It is estimated that neurological diseases will increase approximately 12% over the next 20 years. Neurological disorders have a reported prevalence rate of 8.7% in the Americas. In the United States neurological disorders have been noted as the second leading cause of death and disease (Montefiore Medical Center, 2010). While lower to middle socioeconomic status is related to a higher incidence rate, people in all levels of status experience neurological disorders (Dua, Cumbrera, Mathers, & Saxena, 2006). When considering other factors in narrowing the populations that experience neurological disorders, there are no distinctive discriminators. Rather, it appears clear that regardless of the specialty or client-typology, counselors are bound to experience clients who have been diagnosed with neurological difficulties.

What might be even more important is the fact that counselors are apt to see clients who have symptoms of neurological dysfunction but who are not diagnosed, who have not had medical attention, and who may not be aware that medical attention is necessary. Indeed, it is not uncommon for clients to seek counseling due to symptoms that are a part of an unrecognized neurological disorder that happens to mimic the symptoms of a mood disorder. To complicate matters, there are more than 600 known possible neurological pathologies that can account for the various neurological symptoms presented to counselors (American Academy of Neurology, 2007). Given this data, there is no denying the critical importance of counselors holding clear knowledge of the most common neurological diseases, the symptoms that accompany those disorders, and a protocol for referring clients to the appropriate medical professionals. Additionally, it is

helpful when the counselor is familiar enough with the factors and treatment related to disorders so as to be a helpful support in assisting the client to comply with the medical doctor's prescribed regimen.

Despite the importance of this knowledge and training, it is likely that many counselors completed their education without exposure to the basics of neuroanatomy, neurological symptomatology, disease, and common treatment. To add to this deficit, even those who did gain such knowledge may well find themselves outdated as our insights into both peripheral and central nervous system functioning and disease is growing swiftly. Hence, it is "smart" for a counselor to at least periodically review the basics of neurology, the current information regarding prevalent diseases, and up-to-date treatment strategies utilized by neurologists and other medical specialists in their referral base. This paper serves to provide this brief overview of, and an introduction to, neuroanatomy to bring the "smart" counselor up to date.

Basic Brain Structures

The illustration below depicts the basic brain lobe structures (Fig. 1). The basic structure of each lobe is provided in the following paragraphs.

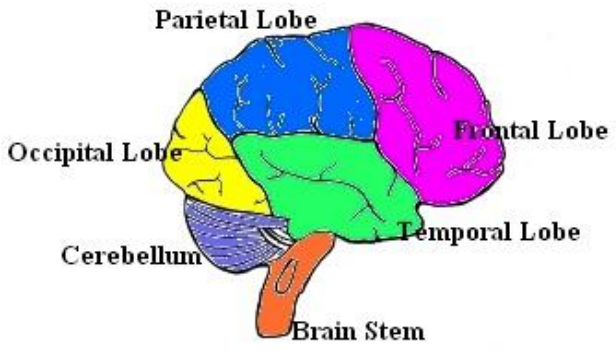

Figure 1. Lobes of the brain, right side view.

Frontal Lobe. Toward the back of frontal lobe is a section called the motor strip. The motor strip contains a premotor and supplementary motor areas. The premotor area is responsible for the planning and initiating of motor movement. The supplementary area is responsible for the controlling of complex tasks. The remainder of the frontal lobe is also responsible for higher order functions such as meta-cognition, cause and effect/futuristic thinking, planning, reasoning, judgment, impulse control, memory, and speech production. Speech production and language processing occurs in the area at the left hemisphere bottom middle of the frontal lobe called "Broca's Area." It is named following research by Pierre Paul Broca who discovered that patients who had experienced injury to this area lost the ability to speak. The frontal lobe is the last of the lobes to mature fully with women peaking in their early twenties and men in their mid-to-late twenties. This lobe is also more susceptible to damage than other lobes due to its location and size (Giedd, 2002).

The Parietal Lobe. Toward the front of the parietal lobe is an area similar to the motor strip called the sensory strip. Like the motor strip, the sensory strip receives signals from sensory nerves, processes the information, and sends messages to specialized areas of the brain in order to receive, code, and respond to sensation. The remainder of the parietal lobe is responsible for cognitive activity such as the integration of sensory information—particularly pain, touch, and visual perception. It is also in charge of spatial orientation and speech. This lobe holds knowledge of numbers and their relations. It also plays a major role in the manipulation of objects.

The Occipital Lobe. The primary roles of the occipital lobe are the control of vision and color recognition. This lobe is not particularly vulnerable to injury due to its location; however, a significant trauma to this lobe may result in visual defects both in perception fields and interpretation.

The Temporal Lobe. The temporal lobe plays a major role in emotional responsiveness. Other critical roles include hearing, memory, and speech comprehension. The latter of these is due to an area named Wernicke's area after the discovery by Karl Wernicke of the area's connection to an aphasic pattern. Wernicke's area is located in the middle of the top of the temporal lobe and not only provides for language comprehension, but it also performs semantic processing, language recognition, and language interpretation. Damage to the temporal lobe is noted primarily by eight major signs including changes in auditory sensation and perception, changes in attention to auditory input, visual perception difficulties, impaired verbal organization, changes in language comprehension, impaired long-term memory, altered personality, and altered sexual behavior.

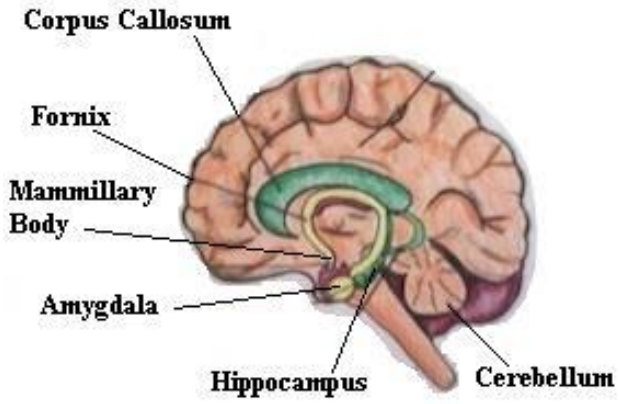

Figure 2. Basic structures of the limbic system.

The Limbic System. The limbic system (see Figure 2 above) involves the coordinated interaction of various particular structures of the brain that influences the endocrine system and the autonomic nervous system. The structures include the hippocampus, amygdala, thalamus, cingulate gyrus, fornix, parahippocampus gyrus, and basal ganglia. The basal ganglia includes the striatum, pallidum, substantia nigra, and subthalamic nucleus. The basal ganglia plays a central role in a number of neurological conditions, including several movement disorders such as Parkinson's and Huntington's, due to the motor coordination role it plays.

The Endocrine System. The system involving particular parts of the brain and the hormones distributed throughout the body is known as the endocrine system. The involved brain structures include the thalamus, hypothalamus, pituitary and the pineal gland. Throughout the body are the thyroid and parathyroid glands, the adrenal glands, the pancreas, and the reproductive glands (ovaries and testies). The glands of the endocrine system and the hormones they release influence almost every cell, organ, and function of our bodies. This system is involved in mood regulation, growth and development, tissue funtion, metabolism, and sexual and reproductive processes. Hormone levels are influenced by stress, infection, and changes in the balance of fluid and minerals in the blood. These influential factors make it difficult to note when changes in emotions are due to neurological issues or to factors in the environment.

The Neuron and Synapse. The basic cells comprising each structure within the brain are called neurons (See Figure 3). Critical components of neurons include the cell body that houses the nucleus (the motherboard of the cell), axons (the long corridor running outward from the cell body), the terminal button at the end of the axon, and the dendrites at the other end of the cell body. The nucleus dictates the cell's gathering of ingredients and making of specific neurotransmitters (brain hormones that signal other neurons into action). The axon is covered by a waxy substance called myelin sheath that serves as an insulator for the axon making possible the transmission of messages cell to cell in a much more efficient manner. Areas not insulated are called Nodes of Ranvier—the spots where, like an old telephone line, the

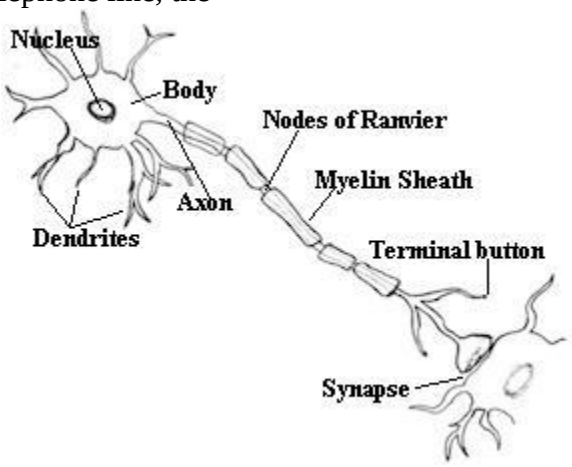

Figure 3. The components that make up a neuron.

messages jump until reaching the end of the axon and cueing the dumping of the sacs containing the premade and waiting neurotransmitters at the terminal button. The neurotransmitters are dumped into the synaptic cleft (area between the terminal button and the next cell's dendrites). This process is known as synapse and is the neurons' means of communication signals throughout the brain. The dendrite of the next neuron picks up the neurotransmitter and, when full, signals the action of its cell. Should this system be interrupted by a break down of the myelin sheath, the insufficiency of neurotransmitter or its ingredients, or the ineffective collection of neurotranmitter, the area of the brain so interrupted does not function properly.

The Meninges and Spinal Fluid. The meninges (See Figure 4) is comprised of three layers of protective coverings including the Dura Mater (just beneath the skull), the

Arachnoid Mater, and the Pia Mater (closest to the brain). Spinal fluid fills more than the spinal cavity in that it is the fluid that is found cushioning around the brain and within the shock-absorbing vacuoles which are cavities found in the central regions of the brain.

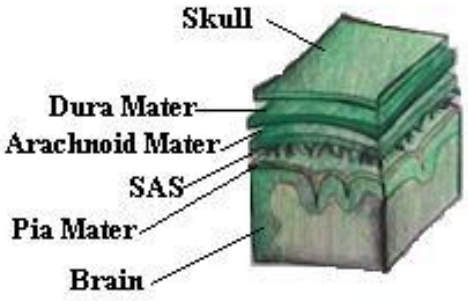

Figure 4. The layers of the meninges; Dura Mater, Arachnoid Mater, and Pia Mater.

Common Neurological Disorders

The most common neurological disorders and injury apt to present to the counselor include Multiple Sclerosis (MS), Huntington's Disease (HD), Parkinson's Disease (PD), Alzheimer's Disease (AD), Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig's Disease), and meningitis, encephalitis, and closed head injury (American Academy of Neurology, 2007). The following will provide the prevalence rates and most likely symptoms notable to the counselor so as to assist in accurate referral to the appropriate medical professional as well as effective assistance to support compliance with the doctor's prescribed medical regimen.

Multiple Sclerosis. This disorder involves a breaking down of the myelin sheath insulating the axon thus making signals difficult if not impossible to transmit neuron to neuron. The cause is unknown (Dias, et al., 2006). This disease is commonly found across similar latitudinal bands worldwide and occurs in approximately one in one thousand people. The symptoms of this disorder include changes in vision, sensory processing, motor movement, coordination, bladder and bowel control, sexual activity, levels of fatigue, cognition, and mood (American Journal of Pathology, 2009).

Huntington's Disease. Huntington's Disease is thought to result from a genetic degeneration of neurons in the brain caused by a mutation of the protein in the Huntington gene and occurs in approximately 30,000 people currently (American Academy of Neurology, 2007). Changes in the brain are noted in the basal ganglia which impacts motor coordination. Early symptoms include personality changes such as irritability, anger, depression, loss of interest, decreased cognitive abilities such as decision making, learning new information, and remembering information. Other early symptoms include balance issues, clumsiness, and involuntary facial movements such as grimacing. Later symptoms include chorea (sudden jerky involuntary movements throughout the body including eye movements), balance and coordination problems, hesitant or slurred speech, problems swallowing, behavior changes including antisocial behavior, irritability, hallucinations, and restlessness, and finally, dementia (Neuroscience, 2009).

Parkinson's Disease. While the causes of this disorder that occurs in 10 of every 1,000 persons are unclear, genetic factors, environmental factors, toxins, and viruses are each suspect (American Academy of Neurology, 2007). Basic changes noted in the brain related to Parkinson's Disease include lack of dopamine and low levels of norepinephrine (major neurotransmitters) and presence of Lewy Bodies (clumps of proteins). Major symptoms include tremors, muscle rigidity, akinesia (lack of movement or slowness in initiating/maintaining movement), postural instability (a backward or forward lean with frequent falling), cognitive disturbance, visuospatial difficulties, memory dysfunction, and mood alteration (University of Sheffield, 2010).

Alzheimer's Disease. Alzheimer's Disease has likely received more attention than most other neurological disorders. The prevalence rate is noted at 67 per 1000 people (American Academy of Neurology, 2007). The cause remains unknown but contributing factors may be genetic, environmental or life-style issues. The degeneration includes the development of a plaque-like substance that coats the neuron, the entanglement of neurons that seem to fuse together creating neuronal dysfunction, and the creation of holes or vacuole that are demonstrative of absent/non-functioning patches of neurons (Dias et al., 2006). Very early signs and symptoms are primarily noted in basic memory delays. Early symptoms include memory loss, confusion, poor judgment, and personality changes, which are often the reasons noted for a client entering counseling without yet having been diagnosed with Alzheimer's Disease. Symptoms during the mid development of the disease include memory loss and confusion increase, difficulty learning new things, hallucinations, delusions, paranoia, impulsive behavior, inability to cope with new situations, and difficulty carrying out tasks with multiple steps. Late stages of Alzheimer's Disease include significant brain tissue shrinkage, severe recent and remote memory loss, inability to communicate, and dependency on others for basic activities of daily living. It is noteworthy that this disorder is not fully accurately diagnosable until a post-mortem autopsy is conducted on the brain (Gzil, 2009).

Amyotrophic Lateral Sclerosis (Lou Gehrig's Disease). This disease is less common than those presented above with four in every 100,000 people diagnosed with ALS (American Academy of Neurology, 2007). This progressive disease affects nerve cells in the brain and spinal cord extending through to the muscles in the body. Its causes are not known; however, the progression of the disease is clear. The motor neurons in the spinal cord degenerate making intentional muscle movement the first to decline and eventually total paralysis ensues leading to death. The onset of ALS usually occurs between the ages of 40 and 70 with men more often diagnosed earlier, but both genders are diagnosed equally in later years. Early symptoms include twitching and cramping of the muscles though early symptoms are experienced differently per person. Muscle weakness is the main early symptom found in most persons diagnosed with ALS resulting in tripping, dropping things, fatigue of the arms or legs, and slurred speech. Eventually symptoms progress to a paralysis that involves the inability to swallow, chew, or breathe. Sight, touch, hearing, taste, and smell are not affected as these are not related to motor neuron functioning. Furthermore, though the muscles of the eyes and the bladder are motor related, these functions generally remain unaffected.

Meningitis and Encephalitis. Both Meningitis and Encephalitis involve the infection by bacteria or virus and resulting tissue swelling that impacts the brain. Meningitis involves infection of the meninges while encephalitis involves infection

within the brain and spinal cord. Bacterial meningitis affects approximately three in every 100,000 United States citizens while viral meningitis affects about 10 in every 100,000. The symptoms of viral meningitis are similar to the flu making those infected less likely to seek medical attention thereby making the number of diagnosed cases smaller than warranted. There are as many as 150 to 3,000 cases reported in the United States annually though many more cases are thought to go unreported. Meningitis is caused by an infection in the blood stream and can be transmitted from person to person through saliva, nasal discharge, and feces. It is noteworthy that much like Multiple Sclerosis, Meningitis is known to occur in latitudinal bands. Encephalitis is caused by any of the following: herpes simplex virus; varicella-zoster virus; arboviruses (from ticks and mosquitoes) including Eastern Equine Encephalitis, St. Louis Encephalitis, and West Nile Encephalitis; and Rabies (contracted through animal bite). Symptoms of both Meningitis and Encephalitis include headache, fever, lethargy, skin rash, irritability, and seizure. Symptoms specific to Meningitis include stiff neck, vomiting, photophobia (eye sensitivity to light), and trouble staying awake. Symptoms specific to Encephalitis include joint pain, loss of consciousness, double vision, confusion, hallucinating, and bulging in the soft spots of the skull in infants. These neurological disorders differ from others in that there are steps that can be taken to prevent them. There is now a vaccination series for Meningitis along with other vaccinations that may assist in prevention including Measles, Chickenpox, pneumococcal infection, and Haemoplius influenza type B (Hib). Encephalitis may be prevented by taking caution in areas where mosquitoes and ticks are more common such as using netting or repellant (Dias et al., 2006).

Closed Head Injury. Closed head injuries represent one of two types of Traumatic Brain Injuries (the other is open head injuries such as gun shot wounds and other obviously visually noted injuries to the head). One half-million closed head injuries present in medical facilities each year, which are caused by motor and non-motor vehicle accidents, assaults, falls, sports related mishaps, and other events that create trauma to the brain and surrounding tissues (Faul, Xu, Wald, & Coronado, 2010). Closed head injuries include four major categories of injuries that are not obviously visually notable. These include concussion, contusion, diffuse axonal injury, and hematoma.

Concussion is diffuse trauma to the brain that results in symptoms such as head ache, dizziness, nausea with or without vomiting, ringing in the ear, speech production issues such as slurring, confusion, disorientation, decrease in balance, mood swings, sensory sensitivity, and sleep pattern disruptions. Concussion is often noted medically by dilated pupils with application of bright light with treatment likely being close watched inactivity, monitoring of symptoms, and general rest.

Contusion is the bruising of the brain (hemorrhage) in a localized area that accounts for approximately 20-30% of head injuries (All About Traumatic Brain Injury, 2009). Symptoms of contusion include weakness, numbness, decrease in coordination, memory problems, cognitive problems, and pressure. The brain can reabsorb the blood from a contusion and often does so over time. When the brain does not do so and the blood is found in the spinal fluid, permanent neurological damage may result. Contusions require immediate medical attention. In addition to the treatment for concussion, contusions may require surgical intervention.

Diffuse axonal injuries are often caused by high-speed motor vehicle accidents and includes wide spread brain injury and swelling producing intracranial pressure. The consequences are permanent and most often lead to vegetative states or coma. At best, rehabilitative treatments are required and ongoing caregiving needed. At worst, death ensues. Often vegetative states persist and can do so for years (All About Traumatic Brain Injury, 2009).

Hematoma is the pooling of blood between the brain and the skull resulting in decreased levels of consciousness (unconsciousness), seizures, and lethargy. The area of pooling dictates the type of hematoma. Subdural hematoma is the pooling of blood between the brain and dura mater. Epidural hematoma occurs between the dura mater and the skull. Intraparenchymal hematoma occurs within brain tissue. Hematomas may create pressure on the brain and result in a multitude of dysfunction. Immediate and ongoing medical attention is required, and surgery may be needed to reduce the pressures to prevent ongoing or permanent symptoms or death. Recovery from hematoma can be lengthy (All About Traumatic Brain Injury, 2009).

Treatment for closed head injuries varies according to the location, severity, and type of damage involved in the injury. At a minimum rest, pain relievers, and monitoring are provided. At more severe but non-lethal levels diuretics, anti seizure medications, induced coma, surgical removal of clots, draining and shunt applications, and rehabilitative services may be required.

The Counselor's Role

Counselors must know the symptoms and signs and the common complaints that are associated with each stage of each of the most common neurological disorders and injuries presented above in order to be effective as an initial screen for neurological disorders that might present in the counseling office. It is not critical nor ethically a part of the counselor's role to be able to diagnose the suspected neurological disease given the presentation; rather, the counselor must have a solid, known, trusted, appropriate medical professional to whom to refer.

In addition to the ongoing cultivation of positive collaborative relationships with general practitioners, counselors are best prepared to refer clients once that relationships exist between counselors and neurologists, hospitals, rehabilitative service providers, and others involved (Fairfax, 2007). Such relationships can begin by attendance at local or regional conferences for treatment providers of neurological disorders where knowledge of current best practice can be gained and networking orchestrated. A knowledgeable counselor may then offer adjunctive services and work to build a reciprocal relationship with said treatment providers (Corazzini, 1992).

The counselor must have a protocol for assuring successful and timely referral of their client to an appropriate medical professional and must offer to the medical professional (after appropriate release of information) all pertinent data as well as the counselor's position of supportive adjunct to the doctor's prescribed regimen. Such a protocol should be outlined in a documentation that makes clear the services offered and the limitations of services for clients and caregivers as well as for other providers (e.g., medical and rehabilitative). Referral should begin with the client's general practitioner and must be made in accordance with the client's insurance requirements to avoid undue

financial hardship for the client. Should the client not have a primary medical provider, a referral directly to a neurologist may be in order. It is also appropriate and even necessary to send a patient with even a remote hint of acute issues to the emergency room without hesitation of any kind. Again, symptoms indicative of neurological issues such as meningitis, encephalitis, concussion, contusion, diffuse axonal injury, or hematoma should be referred immediately for medical evaluation.

The counselor's role may well include not only a supportive function in helping the client to be compliant with the medical doctor's instruction; additionally, the counselor may provide psycho-education, support, grief work, and lifestyle adjustment work in order to assist the client in achieving the best possible quality of life given the disease and its accompanying symptoms. It is often the role of the counselor to assist the client in exploring and defining life meaning and post life/death beliefs in accordance with the client's interest in doing so. There are times when the counselor's job may include occupational/career goal redefinition and adjustment. In some cases the counselor is critical in problem solving for avoiding reoccurrence or future prevention where possible.

The counselor may also provide education, support, grief, and adjustment assistance to the family of the afflicted or other persons significant to the client. One population of clients seeking services from counselor is caregivers for various disabled populations including those with the above neurological issues (Taylor, 2005). Caregivers are at markedly increased risk for burnout, inordinate stress, and depression. Supportive and educative services from counselors can prove to be invaluable in the health and well-being of caregivers and family members. Focus in counseling for the caregiver may include a reduction in personal stressors, clear delineation of goals/solutions for issues related to caregiving and self care, effective communication, and relationship building with physicians, nursing staff, and rehabilitation specialists may prove to be extremely helpful (All About Traumatic Brain Injury, 2010).

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Note: This paper is part of the annual VISTAS project sponsored by the American Counseling Association. Find more information on the project at: http://counselingoutfitters.com/vistas/VISTAS_Home.htm