

Dr. Gudrun Lange, Ph.D., is a Clinical Neuropsychologist with sixteen years of experience in the assessment and study of the cognitive and behavioral aspects of chronic pain and persistent fatigue. She has received federal grants for her work and most recently, received National Institutes of Health (NIH) funds for a pilot study to assess the tolerability and efficacy of vagus nerve stimulation (VNS) therapy in patients with severe Fibromyalgia (FM) pain. Dr. Lange reviewed the process of neuropsychological testing for Chronic Fatigue Syndrome (CFS) and FM at the April 28, 2012 Educational Forum co-sponsored by the Massachusetts CFIDS/ME & FM Association (MassCFIDS) and the Massachusetts Department of Public Health.

Dr. Lange said that in the absence of objective biomarkers neuropsychological testing is "the silver bullet" when it comes to qualifying for disability. Cognitive testing is accepted as an objective measure of impairment in function by the Social Security administration.

## **Dr. Gudrun Lange: the Boston approach**

Dr. Lange uses a quantitative, individualized approach to neuropsychological testing that allows for detailed interpretation of the test data within the context of an individual's overall profile of cognitive strengths and weaknesses. While individuals with Chronic Fatigue Syndrome generally report that the cognitive problems they experience are of great impact on their lives and everyday function, quantitative, objective neuropsychological testing often reveals very subtle cognitive problems. Many times the deficits found on objective testing do not rise to the level of an absolute impairment. Dr. Lange argued that any deficits observed need to be interpreted relative to the individuals other strengths and weaknesses, otherwise it may lead to misleading findings.

## **Difference between focal or diffuse brain injury**

Dr. Lange provided a brief overview of the developmental history of clinical neuropsychology. She mentioned that neuropsychological testing evolved to assess individuals with focal acquired brain injuries for diagnosis and management. She distinguished acquired brain injuries that occur after birth from those that an individual is born with, congenital or genetic brain conditions. Before the advances made in neuroimaging technology such as Cat and MRI scans, neuropsychology was used to pinpoint the area of dysfunction in the brain. However, damage to the brain is not always focal, but can be diffuse in nature. Dr. Lange explained that neuropsychological assessment of diffuse brain injuries, affecting many interconnecting areas of the brain, is difficult as the measures were developed to reveal dysfunction in specific brain regions. These conditions include Multiple Sclerosis, Parkinson's disease or Chronic Fatigue Syndrome.

She noted that appropriate interpretation of test data from individuals with these conditions requires a significant degree of interpretation and knowledge by the practitioner. If a

neuropsychologist has not had the opportunity to deal with patients with an illness that affects the brain in a diffuse and subtle manner, such as CFS, they might not be sensitive to the type of cognitive dysfunctions seen in these patients. Patients need to find neuropsychologists who are sensitive and knowledgeable to these issues. When a patient is looking for a neuropsychologist, he or she must find someone who is knowledgeable about CFS and FM. Patients must interview neuropsychologists to determine the best candidate, because neuropsychological testing is expensive. CFS patients have deficits. A knowledgeable neuropsychologist must look at the numbers across the different cognitive domains for an appropriate reflection of the cognitive profile with its strengths and weaknesses.

## **Not less smart, just less fast**

The brain is organized in a fashion where basic motor and sensory functions are well represented allowing for a significant degree of redundancy. Therefore, if a problem occurs in one of these regions, the brain can adjust for it.

This is less true for cognitive functions that are considered "higher" functions, such as executive function, attention, working memory and information processing. Symptoms in CFS such as brain fog and memory impairments fall under these higher levels of brain function. Although many patients find ways to compensate and may not notice their full impairments all at once, it gets more exhaustive for the patient as they have to exert increased amounts of energy to do the same mental tasks.

## **CFS patients specifically**

It is not the case that patients with CFS become less intelligent. Many patients are concerned that they are "dementing." Dr. Lange stated that she has not seen a CFS patient with dementia. CFS is not a degenerative neurological disorder. I.Q. tests are divided between steady state functions, well-entrenched information firmly planted in the brain, and more transient functions. The steady state information does generally not decay in patients with CFS.

In Dr. Lange's experience, the major problem with CFS patients is the slowing down of information processing. It affects working memory, the ability to keep pieces of information in mind for immediate use. For instance, hearing a phone number and then being able to recall it five minutes later to make the call. For most CFS patients, that is impossible. The resulting frustration then makes the cognitive problem worse.

Dr. Denise Park has called this the "premature aging of the brain," meaning that the brain in a thirty-five-year-old fibromyalgia patient in Park's study (Arthritis & Rheumatism, Vol. 44, No. 9, September 2001, pp 2125-2133, Cognitive Function in Fibromyalgia Patients) reflected the neuropsychological testing performance of a person 20 years older.

## Neuropsychological testing for CFS

Dr. Lange described how she conducts neuropsychological testing. First, she conducts a thorough clinical interview, which lasts about two hours. After the clinical interview, patients receive a full I.Q. assessment.

After the I.Q. testing, she tests for memory, attention, visual, language, and motor function, and executive function including multi-tasking and decision-making. Language, visual and motor function are almost never affected, but attention and executive function are usually abnormal and often relatively impaired.

Overall, she spends a total of 20-25 hours on a case, first reviewing the medical records, then spending time with the patient in the initial interview, then hours of testing and scoring with several more hours for writing up the report,.

If a patient is required to redo the testing for Social Security, Dr. Lange uses a screening tool and taps into the specific issues previously identified to keep the time and costs down and it usually takes 3-4 hours.

## To test or not

If a patient is trying for Social Security disability, neuropsychological testing is the only objective test to show a dysfunction in the brain. MRI and SPECT scans are not standardized for CFS. Again, Dr. Lange pointed out that *there are no focal injuries in CFS*. It is a diffuse assault of the central nervous system in the brain, so static MRI scans are generally normal.

Dr. Lange urged patients to carefully think about undergoing neuropsychological testing before paying the expense of the testing procedures. She recommended discussing it with a patient's physician before moving forward to identify a clinical neuropsychologist with knowledge about cognitive function in CFS.

Dr. Lange also recommended patients proceed with integrative medicine because a CFS patient must approach the chronic condition in an integrative fashion. That includes pharmacological approaches, but also complementary alternative methods such as low impact physical modalities - tai chi and Qi Gong are two techniques that patients can do at their own pace. Dr. Lange underscored the importance of "coaching," an intervention that can help patients learn ways to gain a modicum of control back over their lives and ultimately, feel better.