



## **Causes of Mood Change in MS**

### **Featuring: Dr. Anthony Feinstein & Dr. Fred Foley**

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#### **Dr. Anthony Feinstein**

I think the causes are going to be multifactorial. Cognition, it's easier to look at the brain and say why someone is cognitively impaired. You can make a reasonable connection between what's going on in the brain and cognition. With mood, it's more complex because of the lives that we lead and how social factors can influence how we feel. That said there's now a growing brain imaging, uh, database showing that particular changes in the brains of MS patients are linked to depression. So, for example, work that we've done in our lab using detailed, uh, brain MRI has shown that lesions in anterior parts of the brain, anterior temporal lobes, middle parts of the frontal lobe are strongly associated with clinically significant depression.

We've also shown that brain shrinkage or atrophy in the same areas can be linked to depression. You now have brain MRI that is very sophisticated that allows you to explore normal appearing brain tissue so you can look at the parts of the brain on MRI and they appear normal to the naked eye but we can extract information from that that tells us there's a pathological process at work. We know that brain changes are now implicated in depression.

At the same time, when you look at the psychosocial literature, which is very big, you see lots of relevant data there as well in terms of coping styles, coping strategies. We know which ones are good, which ones are bad and the bad ones predispose individuals to developing depression as well. We're at a point in research where we can't just say, well, let's look at the MRI, we're going to get all the answers. You cannot be that reductionistic now. You really have to look at multiple aspects of a person's life to understand the depression

Higher levels of cortisol have been linked to depression. In healthy people, we go through what's called a circadian rhythm in which cortisol levels are higher in the morning and they tend to drop as the day progresses and that's why we become fatigued, etc. One of the theories behind major depression is that the cortisol levels can remain persistently high or the fall off in cortisol that you should see over the course of 24 hours, uh, somehow are different. It doesn't fall off as much. And once again, there's some imaging data to suggest a relationship between the abnormalities you see in the

hippocampus, the shrinkage of the hippocampus, and the higher levels of cortisol, uh, in MS patients. So a nice biological association between biochemistry, brain imaging and depression.

### **Dr. Fred Foley**

There is some speculation that the immune system can be related to depression in persons with multiple sclerosis. There have been some studies in the late 1980's and early 1990's have found correlations between changes in mood, particularly elevations in depression and markers of immune activation in the blood of persons with MS.

There have been more recent studies that found that when people with MS are depressed at a clinically-elevated level, that is, that very severe type of depression, where one feels that one has difficulty functioning, that that is associated with markers of disease activation in the blood of persons with MS. A recent study that was published in 2012 found that in a randomized controlled trial, that treating MS patients with stress management, um, was highly associated with the reduction in, uh, new lesions in the brain on MRI. Stress management is, um, it means a number of different things. It means changing the person's thinking in a way that is more positive than negative. It means taking care of one's self through relaxation approaches, such as meditation, or yoga, or other approaches that can relax the mind and the body.

This adds to the growing literature that distress in general is associated with inflammatory processes in the body, which may not be that big of a deal if one doesn't have an inflammatory disease. But it may affect persons with MS. So if you are a person with MS who has, uh, acute distress, depression, severe anxiety, it really is important to get that treated properly.