

## Nutrition: Anxiety, Depression and Cognitive Disorders - Part 1

Hey, everyone. In this presentation, we're going to talk about diet and lifestyle strategies for anxiety, depression, and mental health disorders.

One in four American adults today experiences mental illness. One in 17 lives with a serious mental illness such as schizophrenia, major depressive disorder, or bipolar disorder. Half of all chronic mental illness begins by age 14 and three-quarters by age 24. Almost 7 percent of American adults live with major depression, and that number grows each year. Eighteen percent of American adults live with an anxiety disorder. Depression is now the leading cause of disability worldwide.

Mental illness is a complex combination of various genetic and epigenetic factors, including nutritional, physical, biochemical, environmental, social, emotional, and spiritual influences.

Typical treatment of mood disorders, of course, involves antidepressant drugs. Antidepressants are the number two most prescribed class of drugs in the US. Eleven percent of Americans over age 12 currently take antidepressants, so that's more than one in 10 people.

Many people taking antidepressants, though, have not been diagnosed with a psychiatric or mental health condition. Thirty to 40 percent of patients don't respond to antidepressants. Medication is often not effective particularly in mild to moderate depression, and research suggests there is very little difference between placebo and active medication in those conditions.

Note that this is an average. When we do studies like this, studies are looking at an average result over a wide number of people, and that doesn't take into account individual differences. As clinicians, we treat individuals, not averages, so even though in those studies we could say, on average, there's no difference between placebo and active medication for mild to moderate depression, that's doesn't mean some people within that group don't respond very well. Some people certainly do respond very well, other people don't respond, and other people respond negatively, and when that's all averaged out, it's a null response. There's no response. But you have to consider individual variability there.

Of course, the other issue with antidepressants is that they're not benign and free of side effects. In fact, they have quite a few side effects. These include fatigue, insomnia, constipation, dizziness, irritability, agitation, anxiety—which is ironic because they're often used to treat those conditions—weight gain, sexual dysfunction, gastrointestinal bleeding, movement disorders like rigidity or involuntary movements or restlessness. They can affect the HPA axis and cortisol secretion. They can cause amotivational syndrome, which is a blunted emotional response, and manic or violent behavior. There's some question about the relationship between certain antidepressants and



Parkinson's disease, and there's also an increase in suicide and suicidal ideation in some populations, particularly young people taking antidepressants.

From a functional medicine perspective, we want to address depression and anxiety and other mental health disorders in the same way that we address other problems. We want to look at what the underlying causes are for these conditions. In the case of mental health disorders, there are numerous possible underlying causes, as I mentioned on the second slide, but there's a growing body of research that suggests that many of these disorders are primarily caused by inflammation.

Particularly with depression, there is research suggesting that it is caused at least in part by lowgrade chronic inflammation. There's actually a name for this theory called the inflammatory cytokine model of depression. It basically holds that inflammation happens systemically often as the result of gut issues and gut pathology. Here's the gut-brain axis again! Inflammatory cytokines are produced in the gut, they get into the bloodstream, and they travel through the bloodstream, up to the brain, they cross the blood-brain barrier, where they then suppress the frontal cortex. The frontal cortex is responsible for a lot of our higher brain function, so when the action of the frontal cortex is suppressed, you get symptoms that are analogous to what you see in major depressive disorder.

This theory is growing in recognition and popularity. Many researchers and clinicians, myself included, believe it's more convincing than the chemical imbalance theory that has been the dominant paradigm of understanding depression for many years. Our Western diet and lifestyle are full of inflammatory factors. There are all kinds of underlying pathologies that we're discussing throughout the course that cause inflammation, and SSRIs, a major class of antidepressant drugs, have been shown to have an anti-inflammatory effect, which may actually explain their mechanism of action when they are effective. So from a functional perspective, we always want to be looking at inflammation and particularly gut inflammation and gut health when we're looking at mental health disorders, and we want to be making sure we're addressing any potential causative factors of inflammation, whether that's diet or sleep deprivation or not enough exercise or too much exercise or environmental toxins.

Excess sugar, of course, can be a contributor to an inflammatory gut microbiota, and there's certainly a positive connection between insulin resistance and impaired glucose tolerance, which can be caused by excess sugar consumption and depressive symptoms. Blood sugar swings and hypoglycemia can cause anxiety-like symptoms just from the changes in blood sugar that can occur.

Then caffeine, which is the drug of choice for most people in the industrialized world, although many studies suggest that moderate intake of caffeine and coffee are probably beneficial, that depends on the individual, and certainly excess caffeine intake can be associated with anxiety and HPA axis dysfunction. A significant number of people, up to 50 percent, have a problem processing caffeine in the liver. They're slow metabolizers of it, and they may be more susceptible to these effects. However, if you're weaning your patient off of caffeine because of depression, I would recommend that you take that slowly. Caffeine is a drug, and we get habituated to it, so reducing



and titrating your patient off of caffeine over time will be more effective than just going cold turkey, which can cause a lot of withdrawal symptoms.

Omega-6 fats found in highly processed industrial seed oils can, in some studies, contribute to a systemic inflammatory condition, which could also contribute to depression. These oils are found mostly in processed and refined foods, foods that come in a bag or a box, restaurant foods. Many restaurants cook with these oils. They're fragile. They're susceptible to oxidative damage when heat is applied, so if they're used in cooking and frying, they can become easily rancid and oxidized, and they can cause problems for that reason.

There's some evidence, although this remains quite controversial, that the omega-6-to-omega-3 ratio is implicated in depression and other conditions. Many researchers now believe that it's really just the absolute level of omega-3 that makes the biggest difference, not the omega-6-to-omega-3 ratio, but in any case, if the patient's background intake of preformed EPA and DHA, the long-chain omega-3 fatty acids, is low and their only real source of omega-3 is plant-based omega-3s, then we do know that omega-6s will reduce the conversion of short-chain omega-3 fats like alpha-linolenic acid to the long-chain derivatives like EPA and DHA, which are the most important and have all of the health benefits that we want from omega-3s. So the Standard American Diet where people aren't eating enough cold-water fatty fish or preformed EPA and DHA, their intake of omega-6 is very high, and their intake of plant-based omega-3s is somewhat low, that could cause an inflammatory environment.

Then, of course, we have refined cereal grains—bread, flour, grain-based desserts. The top six foods consumed in the American diet include a lot of this refined grain. One is grain-based desserts, another is bread, another is pizza, and then another would be alcohol, primarily beer. So we have a lot of grains there, mostly acellular carbohydrates. I talked about that in another part of the presentation, but these are carbohydrates where the cellular structure has been broken down and they are rapidly absorbed in the upper part of the digestive tract, which can provoke an inflammatory gut microbiota. They also lack fermentable fibers, which feed the beneficial bacteria in the colon, and that also contributes to an inflammatory gut microbiota. Many of the refined grains contain gluten, which a substantial number of people are intolerant of, whether we're talking about non-celiac gluten sensitivity or undiagnosed celiac disease. And finally, some of the pesticides used on industrially grown grains may contribute to intestinal permeability. We're seeing more research about that.

Chemicals and preservatives found in highly processed and refined foods like artificial flavors, colorings, etc., have also been linked to behavioral problems and hyperactivity in children, and they may also cause food allergy and sensitivity reactions that affect brain function.