Dr. Anderson's BRAIN FOG Protocol: Healing the Blood-Brain Barrier Transcript

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Why Sleep Is Your Brain's Cleanup Crew

Sleep, believe or not, what your Sleep, believe or not, what your grandmother probably told you sleep is grandmother probably told you sleep is important, it actually is important. And important, it actually is important. And it turns out what we know now is that it turns out what we know now is that the brain, the lymphatic flow in the the brain, the lymphatic flow in the brain is actually more efficient when we brain is actually more efficient when we Hey, I'm Dr. A and this is my channel Hey, I'm Dr. A and this is my channel where we talk about all things where we talk about all things integrative and naturopathic medicine.

integrative and naturopathic medicine. Today we want to get into brain fog. Today we want to get into brain fog. Brain fog is an extremely potentially Brain fog is an extremely potentially debilitating condition that can happen debilitating condition that can happen for a large number of reasons. It is for a large number of reasons. It is much more common than we often think much more common than we often think about and if you haven't had it, you about and if you haven't had it, you really may not understand how pervasive really may not understand how pervasive and problematic it is for a person. So and problematic it is for a person. So we want to break it down a little bit we want to break it down a little bit today, get into some of the top reasons today, get into some of the top reasons why it happens and things you might why it happens and things you might consider doing about it. So we're going consider doing about it. So we're going to call this brain fog 101. We may do to call this brain fog 101.

How the Brain Actually Works

We may do others if you want to hear more about others if you want to hear more about it, give us some comments and we'll it, give us some comments and we'll definitely build some more video content definitely build some more video content cuz that's what we do here. So the first cuz that's what we do here. So the first thing is is that you need to understand thing is is that you need to understand the way that your brain generally works.

the way that your brain generally works. So we know that, you know, our brain is So we know that, you know, our brain is in our head and it communicates through in our head and it communicates through the spinal cord and some cranial nerves, the spinal cord and some cranial nerves, all of that business, but the brain is all of that business, but the brain is really very unique in the way that it's really very unique in the way that it's biology works and the way that it takes biology works and the way that it takes care of itself because it is a primarily care of itself because it is a primarily fatty organ and so you think, well, fat, fatty organ and so you think, well, fat, like, you know, not like body fat, but like, you know, not like body fat, but neurological cells are full of neurological cells are full of phospholipids and other lipids that make phospholipids and other lipids that make up the membranes of the brain cells and up the membranes of the brain cells and then all of the membranes of the nerve then all of the membranes of the nerve tracts and the peripheral nerves. So tracts and the peripheral nerves. So there's just a lot of fat in there due there's just a lot of fat in there due to the phospholipid content. Within to the phospholipid content.

The Blood-Brain Barrier and Glial Cells Explained

Within those phospholipids then you have the those phospholipids then you have the sending and receiving type cells that sending and receiving type cells that usually operate by sending and receiving usually operate by sending and receiving neurotransmitters and then those create neurotransmitters and then those create electrical impulses that create electrical impulses that create thoughts, feelings, all sorts of things thoughts, feelings, all sorts of things in your brain. Your brain is protected in your brain. Your brain is protected by an organ system, it's not one thing, by an organ system, it's not one thing, called the blood brain barrier, which called the blood brain barrier, which you probably heard of. And the blood you probably heard of. And the blood brain barrier is supposed to help so brain barrier is supposed to help so that the blood can come and deliver the that the blood can come and deliver the nutrients necessary and then let them nutrients necessary and then let them into the brain and also help to take into the brain and also help to take away some of the toxic things and other away some of the toxic things and

other stuff that may need to go out. It does stuff that may need to go out. It does this through a series of a lot of this through a series of a lot of different types of receptors that are different types of receptors that are very, very specialized. So if the blood very, very specialized. So if the blood brain barrier becomes dysfunctional, the brain barrier becomes dysfunctional, the rest of the brain doesn't work quite the rest of the brain doesn't work quite the way it's supposed to. On the inside of way it's supposed to. On the inside of your brain, you have these nerve cells your brain, you have these nerve cells and the tracts and all of those things, and the tracts and all of those things, but we also have support cells like but we also have support cells like glial cells, you g l i a or glial cells.

glial cells, you g l i a or glial cells. We hear about those, you know, long We hear about those, you know, long COVID and other thing, but glial cells COVID and other thing, but glial cells are basically there to be supportive and are basically there to be supportive and helpful to provide what's necessary for helpful to provide what's necessary for all these cells that are trying to all these cells that are trying to orchestrate your thought patterns and orchestrate your thought patterns and your brain function, etc. Then there's a your brain function, etc. Then there's a special type of physical drainage, if special type of physical drainage, if you will, called the glymphatics with a you will, called the glymphatics with a g l y m, glymphatic. So you've heard of g l y m, glymphatic. So you've heard of lymphatic drainage, that's what drains lymphatic drainage, that's what drains the excess fluid from the interstitium the excess fluid from the interstitium around your body. Well, the glymphatic around your body. Well, the glymphatic system helps to do that with your brain.

system helps to do that with your brain. Now, if in your peripheral body your Now, if in your peripheral body your lymphatic system backs up, we call lymphatic system backs up, we call lymphedema, right? If in your brain your lymphedema, right? If in your brain your glymphatic system gets slow, you glymphatic system gets slow, you actually can get low or high grade brain actually can get low or high grade brain edema and that doesn't allow you to edema and that doesn't allow you to think as well as you might ought to.

think as well as you might ought to. Then there is a combination of all these Then there is a combination of all these things maybe not working correctly, things maybe not working correctly, which can create a background of which can create a background of inflammation in the brain. So if you put inflammation in the brain. So if you put this all together and we remember that this all together and we remember that the way that our brain functions, part the way that our brain functions, part of it is our conscious thoughts, right?

of it is our conscious thoughts, right? So if our brain is functioning normally, So if our brain is functioning normally, we'll feel more like ourselves and our we'll feel more like ourselves and our thoughts will seem to be generated thoughts will seem to be generated quickly. We may look and we may need to quickly. We may look and we may need to recognize something or remember recognize something or remember something and it will come at kind of something and it will come at kind of the normal rate it does for us. When we the normal rate it does for us.

What Brain Fog Actually Feels Like

When we have, quote unquote, brain fog, what have, quote unquote, brain fog, what starts to happen is these normal thought starts to happen is these normal thought processes seem to slow down or maybe processes seem to slow down or maybe even be absent. So we might take longer even be absent. So we might take longer to interact with something. We might to interact with something. We might have a problem remembering something, have a problem remembering something, but not just once or not just cuz you but not just once or not just cuz you were tired, but that's just a chronic were tired, but that's just a chronic thing. And the biggest problem that thing. And the biggest problem that people will see and report is that they people will see and report is that they know this is not how they normally are.

know this is not how they normally are. They didn't used to be this way, okay? They didn't used to be this way, okay? So that is the biggest problem is the So that is the biggest problem is the noticing of the difference from before noticing of the difference from before you had it to until when you do have it.

you had it to until when you do have it. It becomes difficult because there's a It becomes difficult because there's a collection of all these cells and organ collection of all these cells and organ systems and processes that make up the systems and processes that make up the nervous system, that make up our thought nervous system, that

make up our thought patterns and our memory and everything patterns and our memory and everything else. And so you have a lot of inputs else. And so you have a lot of inputs into the system and if I have one input into the system and if I have one input that's not working correctly, I can have that's not working correctly, I can have one kind of brain fog. If I have other one kind of brain fog. If I have other inputs that are not working correctly, I inputs that are not working correctly, I may have a different type of brain fog.

may have a different type of brain fog. And so the outcome is I'm not thinking I And so the outcome is I'm not thinking I want, my memory's not the way I want, want, my memory's not the way I want, etc., but I may have different causes etc., but I may have different causes and they may be very multifactorial.

and they may be very multifactorial.

Common Causes of Brain Fog

So some of the more common things that So some of the more common things that we see in the medical world looking at we see in the medical world looking at brain fog are very global and very brain fog are very global and very common types of problems. So you could common types of problems. So you could have things that trigger inflammation.

have things that trigger inflammation. So these could be things like food So these could be things like food sensitivities or food allergies, toxic sensitivities or food allergies, toxic exposures, so things like heavy metals exposures, so things like heavy metals and mold exposure is a big one for this and mold exposure is a big one for this with mycotoxins, mast cell disorders are with mycotoxins, mast cell disorders are a big cause of brain fog, chemotherapy, a big cause of brain fog, chemotherapy, there's a lot of drugs that cause brain there's a lot of drugs that cause brain fog, but chemotherapy for cancer can be fog, but chemotherapy for cancer can be a huge, huge cause of brain fog for a a huge, huge cause of brain fog for a number of reasons. Dehydration, actually number of reasons. Dehydration, actually chronic dehydration can cause its own chronic dehydration can cause its own form of brain fog and dehydration often form of brain fog and dehydration often goes with many of these other problems.

goes with many of these other problems. And then we see brain fog being And then we see brain fog being persistently elevated in people who have persistently elevated in people who have other chronic illnesses, especially when other chronic illnesses, especially when there's more of a complexity to the there's more of a complexity to the chronic illness or a very inflammatory chronic illness or a very inflammatory nature to the chronic illness as well.

nature to the chronic illness as well. So want to compare and contrast just a So want to compare and contrast just a couple of examples of brain fog. So part couple of examples of brain fog. So part of our practice is integrative oncology of our practice is integrative oncology dealing with people to help with side dealing with people to help with side effects of their cancer treatment, effects of their cancer treatment, cancer recovery, cancer prevention and a cancer recovery, cancer prevention and a common, extremely common issue that will common, extremely common issue that will come up is chemotherapy protocol maybe come up is chemotherapy protocol maybe done with some of them maybe very done with some of them maybe very successful, but they will come to us and successful, but they will come to us and they'll say, my brain just feels really they'll say, my brain just feels really dull and I'm not remembering and my dull and I'm not remembering and my thoughts aren't kind of coming as quick thoughts aren't kind of coming as quick as I thought they should and it's been as I thought they should and it's been kind of progressively worse through my kind of progressively worse through my chemotherapy experience. This is chemotherapy experience. This is really, really common. There's a lot of science really common. There's a lot of science published around chemotherapy induced published around chemotherapy induced brain changes. The big areas that brain changes. The big areas that chemotherapy will affect are this chemotherapy will affect are this chronic dehydration that it can actually chronic dehydration that it can actually induce and then also changes at that induce and then also changes at that blood brain barrier, that series of blood brain barrier, that series of receptor types and series of organelles receptor types and series of organelles that make the blood brain barrier. So that make the blood brain barrier. So that I get a dysfunctional blood brain that I get a dysfunctional blood brain barrier and then I have this collusion barrier and then I have this collusion of dehydration and dysfunctional blood of dehydration and dysfunctional blood brain barrier. So patient comes in and brain barrier. So patient comes in and

we start doing work on their blood brain we start doing work on their blood brain barrier and we'll discuss that later. We barrier and we'll discuss that later. We start to work on their hydration and start to work on their hydration and hydration is more than just drinking hydration is more than just drinking water. It includes electrolyte balance water. It includes electrolyte balance and all kind of other things. And then and all kind of other things. And then we may work on some other underlying we may work on some other underlying things that are aimed at helping the things that are aimed at helping the membranes heal up, especially the blood membranes heal up, especially the blood brain barrier. So on a patient on that brain barrier. So on a patient on that end of the spectrum, we have a known end of the spectrum, we have a known insult being the chemotherapy. We know a insult being the chemotherapy. We know a lot mechanistically about how brain fog lot mechanistically about how brain fog occurs post chemotherapy and so we're occurs post chemotherapy and so we're targeting those main, you know, kind of targeting those main, you know, kind of top of the pyramid cause areas and in top of the pyramid cause areas and in many people, if they have been normal many people, if they have been normal before with no brain fog, then they have before with no brain fog, then they have a known insult like chemotherapy and a known insult like chemotherapy and then we get them early enough, we can then we get them early enough, we can start to reverse the trend of the brain start to reverse the trend of the brain fog over the course of weeks to maybe a fog over the course of weeks to maybe a few months. On the other hand, so other few months.

Chemotherapy vs. Chronic Illness Brain Fog

On the other hand, so other end of the spectrum, the other part of end of the spectrum, the other part of our practice is complex chronic illness. our practice is complex chronic illness.

So people who have a lot of reasons why So people who have a lot of reasons why they're chronically ill. So in complex they're chronically ill. So in complex chronic illness patients, often there's chronic illness patients, often there's not one cause like the chemotherapy not one cause like the chemotherapy person, but there's been like a slow person, but there's been like a slow burn that's getting faster over time of burn that's getting faster over time of chronic illness that keeps adding uh chronic illness that keeps adding uh different aspects to it. So there's more different aspects to it. So there's more and more causes for their chronic and more causes for their chronic illness cuz they're not getting better.

illness cuz they're not getting better. And so they may have other symptoms such And so they may have other symptoms such as pain and fatigue and all sorts of as pain and fatigue and all sorts of other things, but then as part of it other things, but then as part of it they'll say, yes, if I look back two they'll say, yes, if I look back two years ago, I definitely had faster years ago, I definitely had faster memory, felt like my brain worked memory, felt like my brain worked better, everything. And now I wake up of better, everything. And now I wake up of feel foggy all day. It's like my brain feel foggy all day. It's like my brain is running slow. But they don't have one is running slow. But they don't have one inciting event like the chemotherapy.

inciting event like the chemotherapy. Now, in those people, sometimes the Now, in those people, sometimes the targets are the same, but our goal there targets are the same, but our goal there is to do some targeting of the brain is to do some targeting of the brain tissues and the brain hydration and all tissues and the brain hydration and all of that, but the more we work on healing of that, but the more we work on healing the reasons that they're chronically the reasons that they're chronically ill, the better the brain function will ill, the better the brain function will be. But that often is instead of weeks be. But that often is instead of weeks to maybe a few months, that might be a to maybe a few months, that might be a number of months to a few years before number of months to a few years before it starts to turn around. Now, when I it starts to turn around. Now, when I say a number of months to a few years, say a number of months to a few years, generally that doesn't mean you're not generally that doesn't mean you're not having happen for that amount of time.

having happen for that amount of time. You're progressing, it's just not you're You're progressing, it's just not you're not progressing to a resolution as not progressing to a resolution as quickly as someone with a single insult quickly as someone with a single insult like chemotherapy that did it. So, what like chemotherapy that did it.

How to Start Healing Your Brain

So, what are ways that we work with this? Well, are ways that we work with this? Well, like I was saying, first thing is why like I was saying, first thing is why did it come on if we know? And so, we're did it come on if we know? And so, we're going to treat the chemotherapy induced going to treat the chemotherapy induced or a trauma induced brain fog probably or a trauma induced brain fog probably differently and a little more focused differently and a little more focused than a chronic illness induced brain than a chronic illness induced brain fog. The next thing is we need to look fog. The next thing is we need to look at what are the things scientifically at what are the things scientifically that we know that can go and help the that we know that can go and help the blood brain barrier, help the blood brain barrier, help the glymphatics, help the glial cells, help glymphatics, help the glial cells, help everybody else to work better and play everybody else to work better and play ball and give you better brain function.

ball and give you better brain function. Now, these are not medical advice, these Now, these are not medical advice, these are general patterns that I see. You are general patterns that I see. You should talk to your provider about any should talk to your provider about any of this, but the first two things are of this, but the first two things are what we would consider to be hygienic or what we would consider to be hygienic or lifestyle types of manipulations. So, lifestyle types of manipulations. So, sleep, believe it or not, what your sleep, believe it or not, what your grandmother probably told you, sleep is grandmother probably told you, sleep is important, it actually is important. And important, it actually is important. And it turns out what we know now is that it turns out what we know now is that the brain, the glymphatic flow in the the brain, the glymphatic flow in the brain is actually more efficient when we brain is actually more efficient when we get better sleep. So, if you think about get better sleep. So, if you think about the reason for the glymphatics to move the reason for the glymphatics to move the junk out of the brain, there's other the junk out of the brain, there's other pathways, but that's a big one. When you pathways, but that's a big one. When you are sleep deprived, the glymphatic are sleep deprived, the glymphatic turnover slows down. Especially if turnover slows down. Especially if you're not getting into deep levels of you're not getting into deep levels of sleep, that's when it's really, really sleep, that's when it's really, really active. So, getting people sleeping active. So, getting people sleeping helps many things, but it actually helps helps many things, but it actually helps your brain in ways other than just you your brain in ways other than just you think, well, I'm tired, so my brain's think, well, I'm tired, so my brain's running slow. That's part of it, but running slow. That's part of it, but also, if you're tired because your sleep also, if you're tired because your sleep cycles are off, it's also because your cycles are off, it's also because your brain is not getting the junk out of it, brain is not getting the junk out of it, it's not getting clearing and cleaning.

it's not getting clearing and cleaning. Hydration goes along with sleep, it's a Hydration goes along with sleep, it's a it's a lifestyle thing. A lot of people it's a lifestyle thing. A lot of people are chronically dehydrated, and like I are chronically dehydrated, and like I said, water plus other factors, said, water plus other factors, electrolyte balance, many other things electrolyte balance, many other things go into hydration. And so, chronic go into hydration. And so, chronic dehydration is not something you reverse dehydration is not something you reverse and it's better tomorrow, but it's and it's better tomorrow, but it's something that you work on through your something that you work on through your diet and lifestyle and usually extra diet and lifestyle and usually extra things such as electrolyte additions, things such as electrolyte additions, etc. So, hydration is a a big picture etc. So, hydration is a a big picture treatment. Now, nutrients is everything, treatment. Now, nutrients is everything, right? So, getting your diet dialed in, right? So, getting your diet dialed in, making sure your diet's not making sure your diet's not inflammatory, which is very inflammatory, which is very individualized, is very important. Some individualized, is very important. Some other nutrients that we might add in other nutrients that we might add in with people are some of those fatty with people are some of those fatty things that your brain uses, and some of things that your brain uses, and some of those may be phospholipids like those may be phospholipids like phosphatidylcholine or some of the phosphatidylcholine or some of the choline molecules you may have heard of.

choline molecules you may have heard of. There's a citicoline, There's a citicoline, phosphatidylcholine, GPC, which is a phosphatidylcholine, GPC, which is a really long name, with a different kind really long name, with a different kind of choline. So, the the choline of choline. So, the the choline molecules that are phospholipids, so molecules that are phospholipids, so phosphatidylcholine, the ones I phosphatidylcholine, the ones I mentioned, can be very, very useful over mentioned, can be very, very useful over time. Again, they won't make you feel time. Again, they won't make you feel better today usually, but over time better today usually, but over time they're very healing to the central they're very healing to the central nervous system. Sometimes people need nervous system.

Sometimes people need help with the essential fatty acids.

help with the essential fatty acids. You've heard of it, you omega-3 from, You've heard of it, you omega-3 from, you know, fish oils or sea vegetables or you know, fish oils or sea vegetables or other things. Those can be very useful other things. Those can be very useful as well. And then, general nutrition, as well. And then, general nutrition, your brain runs on a lot of B vitamins your brain runs on a lot of B vitamins and amino acids. So, making sure those and amino acids. So, making sure those are in your diet, maybe supplementally, are in your diet, maybe supplementally, etc. So, those are all very useful. Now, etc. So, those are all very useful. Now, specific therapies that help the brain specific therapies that help the brain operationally operationally operationally are going to target the brain are going to target the brain mitochondria. So, things that increase mitochondria. So, things that increase the vitamin B3 active form called NAD, the vitamin B3 active form called NAD, we've got videos on NAD. NAD is what we've got videos on NAD. NAD is what helps the mitochondria actually make helps the mitochondria actually make electrical energy to run all of your electrical energy to run all of your cells, and your brain uses a lot of cells, and your brain uses a lot of those. So, supports to NAD might be those. So, supports to NAD might be nicotinamide, also known as niacinamide.

nicotinamide, also known as niacinamide. They orally might be nicotinamide They orally might be nicotinamide riboside or nicotinamide mononucleotide. riboside or nicotinamide mononucleotide.

Those are oral things you can take to Those are oral things you can take to increase your NAD levels. NAD sometimes increase your NAD levels. NAD sometimes is used as an intravenous intervention, is used as an intravenous intervention, and if you're doing that, you're working and if you're doing that, you're working with someone who does that. But, NAD and with someone who does that. But, NAD and boosting NAD in the brain is very boosting NAD in the brain is very important. The other is an add-on important. The other is an add-on therapy because it goes to the therapy because it goes to the mitochondria through a slightly mitochondria through a slightly different pathway is the oldest different pathway is the oldest synthetic drug, we have a lot of content synthetic drug, we have a lot of content on this too, called methylene blue, and on this too, called methylene blue, and it is used more and more in neurological it is used more and more in neurological research because it actually research because it actually does help research because it actually does help with things like memory, brain function, with things like memory, brain function, etc. So, you might look and say, well, etc. So, you might look and say, well, things like, you know, things like, you know, boosting up the things like, you know, boosting up the NAD and the methylene blue, boosting up, NAD and the methylene blue, boosting up, you know, the activity of the you know, the activity of the mitochondria, those seem like they're mitochondria, those seem like they're very targeted therapies. So, do you do very targeted therapies. So, do you do those forever? Not usually. Usually we those forever? Not usually. Usually we do targeted therapies in the beginning do targeted therapies in the beginning to kind of get more energy back into the to kind of get more energy back into the system, and we do the healing things a system, and we do the healing things a little bit longer. So, maybe little bit longer. So, maybe phospholipids and omegas and the B phospholipids and omegas and the B vitamins and amino acids, and the core vitamins and amino acids, and the core things that keep you healthy like things that keep you healthy like better sleep cycles, better hydration, all better sleep cycles, better hydration, all that, those are what are going to get that, those are what are going to get you out of the cycle long term. So, you you out of the cycle long term. So, you sort of go backwards, do a lot of stuff sort of go backwards, do a lot of stuff in the beginning, then do less as you in the beginning, then do less as you over time. Now, blood brain barrier over time. Now, blood brain barrier damage is extremely common in people who damage is extremely common in people who have had radiation to the head, have had radiation to the head, certainly, who've had a lot of certainly, who've had a lot of inflammatory illness, so trauma, you so inflammatory illness, so trauma, you so head traumas will break it up, but also head traumas will break it up, but also people who have had neurological effects people who have had neurological effects from COVID and other infections, and from COVID and other infections, and also people who are chronically ill for also people who are chronically ill for other reasons, people with neurological other reasons, people with neurological autoimmunity. All those people have one autoimmunity. All those people have one thing in common, their blood brain thing in common, their blood brain barrier is dysfunctional. So, the blood barrier is dysfunctional. So, the blood brain barrier, in order to keep the brain barrier, in order to keep the brain working right and to heal these brain working right and to heal these things, it has to heal as well. There things, it has to heal as well. There are a number of things that can be are a number of things that can be healing to the blood brain barrier, but healing to the blood brain barrier, but one of them that has newer research is one of them that has newer research is actually exercise. Exercising the actually exercise. Exercising the skeletal muscle

actually sends signals skeletal muscle actually sends signals out so that your blood brain barrier is out so that your blood brain barrier is told, okay, it's okay to heal up now, told, okay, it's okay to heal up now, right? So, physical exercise. So, we right? So, physical exercise. So, we already have sleep, we have hydration, already have sleep, we have hydration, now we have movement of the body that now we have movement of the body that can be very helpful blood brain barrier.

can be very helpful blood brain barrier. Some of these other things I mentioned Some of these other things I mentioned for the brain proper can be helpful to for the brain proper can be helpful to the blood brain barrier healing up, the blood brain barrier healing up, those phospholipids like citicoline, those phospholipids like citicoline, phosphatidylcholine, GPC, those type of phosphatidylcholine, GPC, those type of things. The omegas can be helpful. Also, things. The omegas can be helpful. Also, there's other things that can be helpful there's other things that can be helpful to blood brain barrier such as to blood brain barrier such as rebalancing the reproductive hormones in rebalancing the reproductive hormones in the body. That's a stretch. Well, in the the body. That's a stretch. Well, in the brain, your brain uses reproductive brain, your brain uses reproductive hormones for generally non-reproductive hormones for generally non-reproductive purposes. And what happens in chronic purposes. And what happens in chronic illness and trauma is our hormones get illness and trauma is our hormones get out of balance, and usually they shift out of balance, and usually they shift towards an inflammatory hormonal mix.

towards an inflammatory hormonal mix. So, this is something you have to have So, this is something you have to have tested and work with a practitioner who tested and work with a practitioner who does this. But, rebalancing of the does this. But, rebalancing of the reproductive hormones also has a feed reproductive hormones also has a feed forward effect onto blood brain barrier forward effect onto blood brain barrier healing. So, as you can see, in some healing. So, as you can see, in some people like the chemotherapy induced people like the chemotherapy induced brain fog, you have a single attack brain fog, you have a single attack point that happened and usually a point that happened and usually a shorter recovery time. On the other end shorter recovery time. On the other end of the spectrum with a complex chronic of the spectrum with a complex chronic illness patient or somebody who's illness patient or somebody who's had a had a number of traumatic brain injuries or number of traumatic brain injuries or any other chronic thing, you've got a any other chronic thing, you've got a longer time have more inputs to why the longer time have more inputs to why the brain fog is there. But, the important brain fog is there. But, the important thing is is that the brain fog, if you thing is is that the brain fog, if you work on healing all the underlying work on healing all the underlying areas, which are complex, you can bring areas, which are complex, you can bring back your brain function that you were back your brain function that you were missing before, and the brain fog missing before, and the brain fog eventually can go to a lower level or eventually can go to a lower level or actually go away. All right, thank you actually go away. All right, thank you for your time today. Thanks for for your time today. Thanks for listening to this. We're going to put listening to this. We're going to put some other links of videos up here some other links of videos up here somewhere. Take a look at our playlists somewhere. Take a look at our playlists over on the YouTube site. Wonderful that over on the YouTube site. Wonderful that you joined us today. Please like, share, you joined us today. Please like, share, subscribe, check us out, and I will see subscribe, check us out, and I will see