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** * * Intro Music * * **

Welcome to Supplementing Health, a podcast presented by Advanced Orthomolecular Research. We are all about applying evidence based and effective dietary lifestyle and natural health product strategies for your optimal health. In each episode, we will feature very engaging clinicians and experts from the world of functional and naturopathic medicine to help achieve our mission to empower people to lead their best lives naturally.

[01:10] A lack of B12 damages the Myelin Sheath that surrounds and protects your nerves. Without this protection, nerves cease to function properly and conditions such as peripheral neuropathy occur. Even B12 deficiency which is relatively mild, may affect the nervous system and the proper function of the brain. Protect your nervous system with AOR's Methyl B12, available in 5 mg and 15 mg doses. Get your today at your local retailer or online at AOR.ca.

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[01:36] *Cassy Price:* Welcome to Supplementing Health. Regular physical activity is an important part of overall health. With an increase of activity, comes a risk of injury and potential neuropathy which is exactly what we will be discussing today with Dr. Tracey Teasdale, naturopathic doctor. Tracey is passionate about health, wellness, and physical activity. She loves running, cycling, competing in triathlons, and paddling. She utilises this passion in her practice to help her patients find their own appetite for healthy living. Welcome Tracey, thanks for joining me today.

[02:05] *Dr. Tracey Teasdale:* Thank you so much for having me. I am really happy to be here.

[02:08] *Cassy Price:* So, for the listeners who might not know, how would you explain what peripheral neuropathy is?

[02:18] *Dr. Tracey Teasdale:* I think the first thing to consider is that neuropathy is a damage or disfunction of one or more of the nerves that can result in numbness, tingling, muscle weakness and pain in the affected area. The thing to consider is that the nervous system is made up of two main parts. There is the central nervous system and the peripheral nervous system. The central nervous system is the brain and the spinal cord, and the peripheral nervous system is the nervous system that integrates the rest of the body. So, peripheral is arms, legs, abdomen, anything that is outside of the spinal column itself.

[02:54] *Cassy Price:* So, neuropathy will appear in different stages depending on when your injury happened or what the cause was, is that correct?

[03:04] *Dr. Tracey Teasdale, ND:* Yeah. The first stage is usually presenting as numbness and pain. So, if it is a chronic injury, an injury I got say I was tackled in football and all of a sudden, I have this pain, if it starts being more insidious or coming on on it's own, you start off with some numbness and pain in the area. Things feel a little bit off. It may be intermittent and there may be some challenges with balance and reflexes and things like that. The next stage is constant pain. So, it goes from this intermittent to more of a constant pain. The next stage is that the pain will intensify, and it will feel

significantly more uncomfortable for patients or athletes. The last stage is complete loss of sensation or complete numbness. So, it is really important that earlier on you can identify these, the easier they are to treat from a professional standpoint.

[04:09] *Cassy Price*: So, once you have damaged these nerves, is it possible for them to regain their full function?

[04:16] *Dr. Tracey Teasdale, ND*: This is one of our naturopathic favourite answers, it is that it depends, right? It depends on the person, it depends on the injury, it depends on the presentation etc. If you catch them early on or if it is a minor injury often times nerves will regenerate quite quickly. There is a variety of different ways that neuropathy can present. The number one most common way is actually called Diabetic Neuropathy, so that is when the nerves are impacted by increased blood sugar levels and decreased circulation. They actually start to degenerate and cause more decrease circulation, more pain and more numbness and that can progress. So, that one, systemic cause for the peripheral neuropathy we really need to treat the cause. Or in an injury based one, often times it is more of an acute injury so generally speaking they will be able to repair themselves.

[05:22] *Cassy Price*: Okay, so, are a pinch nerve and neuropathy the same thing or would they have similar symptoms?

[05:30] *Dr. Tracey Teasdale, ND*: Yes and no. So, a peripheral neuropathy again is the damage or inflammation to peripheral nerves. A pinched nerve is what we call a radiculopathy which basically means it is an issue within the central nervous system. All of the nerves in our body comes out of the spinal cord through the spots between our spinal column and our vertebrae and so the pinched nerve is from the spinal column usually for patients. Peripheral neuropathy is something outside. Having said that, they can look pretty similar because every time you are pushing or pressing on a nerve where there is inflammation, the nerves react the same way in that sharp, numbness, tingling, decreased sensation and pain.

[06:16] *Cassy Price*: If one nerve in an area is affected will it affect its fellow nerves in that area of the body or is that just the way your brain perceives it?

[06:27] *Dr. Tracey Teasdale, ND*: Yeah, it is generally the way your brain perceives it. Nerves, it is kind of like a highway, if you think of a superhighway, the spinal cord is like that and then you have some subsequent highways or smaller highways that come off of that and then you get those country roads, right? It depends on where the injury happens. So, if the injury happens on one of those spinal highways that are pretty big, anything beyond that will be impacted, but if it is sort of toward the end of the nerves journey it is just that last aspect of the nerve that is affected. Does that make sense?

[07:05] *Cassy Price*: Yeah, absolutely. So, you had mentioned that reduced balance was a common symptom of peripheral neuropathy, how does that neuropathy effect your balance? What role does it play in this imbalance that occurs?

[07:21] *Dr. Tracey Teasdale, ND*: Yeah, for sure. All of your nerves serve a variety of functions. So, we normally think of them, I am immensely interested in the nervous system and pain sensations so I nerd out of this stuff a little bit, so I am not sure that the general public thinks about nerves but I would think that most of us think about them in terms of reflexes and controlling our body. If you think about touching a hot stove there is a signal that goes to your brain really quickly to tell you "hey, that's hot. Remove your hand" so that you are going to burn yourself. You also have other

nerves, those ones are just pain temperature sensation, there are other ones that impact pain or chronic pain and there are some other ones that are involved in understanding where our body is in space. We call that proprioception and that is nerve based as well. If you don't know where your body is in space and you can't connect your feet on the ground to your brain and what direction you are in or if you are standing on one foot or two feet or if there is uneven ground that you are walking on, that travels really quickly to your brain to let you know how to maintain your equilibrium. So, if there is a pressure on the nerve it won't necessarily transmit that signal very well so it can result in loss of balance and a reduced awareness of where your body and body parts are in space.

[08:47] *Cassy Price*: That's really interesting. So, when you get pins and needles from your foot or arm falling asleep, is that also due to your nerves and can it be part of neuropathy?

[09:05] *Dr. Tracey Teasdale, ND*: Yeah. So, if your foot falls asleep it is basically a stress or a strain on the nerve and so it is just a short acute sensation in your nerve. Then the same things happen, I'm sure everyone listening has probably hit their funny bone at some point, that is a nerve in your elbow, and it hurts when that happens. It is not so funny unfortunately; I am not sure why they call it that. It is the same thing. It is a short-term aggravation of the nerve. When you get pins and needles in your feet it is the same idea, it is just a short-term stress that recovers really quickly. That shows you how resilient our nervous system can be but the peripheral neuropathy when it becomes more clinically significant people are sensing that more frequently. You can get an idea of what patients or athletes with neuropathy is feeling because they have that funny bone feeling or that pins and needles feeling much more chronically.

[10:03] *Cassy Price*: So, then, for someone who has suffered a sports related injury, how common is it for them to actually end up experiencing peripheral neuropathy?

[10:16] *Dr. Tracey Teasdale*: Yeah, it really depends on how the injury presents and what happens, right? So, any time there is an injury, nerves are often involved. If you think about our nerves, they come from our brain to our spinal cord and they exit through holes through the vertebrae and then they travel through different areas, like they travel through our hips and our shoulders and down to our elbows so any time there is hyperextension or hypermobility of that joint, it can stretch the nerves as well. So, it can be quite common for athletes to experience it. Then there are a few sports that actually will have an increased rate depending on the risk of acute contact injury. There are some that are more repetitive with overuse as well. It can be quite common in certain sports for sure.

[11:14] *Cassy Price*: What parts of a body are most likely to be affected?

[11:19] *Dr. Tracey Teasdale, ND*: The hands and feet are the most common areas for sure, but it can appear anywhere.

[11:27] *Cassy Price*: So, you had mentioned that sports that have more repetitive actions have an increased risk of experiencing neuropathy. So, repetitive microtraumas that occur in athletes, can they build up to create neuropathy then and how can athletes prevent those when they are practicing their preferred sport?

[11:53] *Dr. Tracey Teasdale, ND*: For sure. So, again it comes back to what is causing the neuropathy. Is it an actual damage and inflammation to the nerve itself which it can be or is it something that is pressing or pushing on that nerve? That can be often times muscle imbalances and postural concerns as well. So, there are definitely things that athletes can do in terms of making sure their form is correct including lots of time for recovery after a training session. A lot of times we think the

training session is the most important part for an athlete, but we often forget about the recovery aspect. There are some things we can do in terms of bodywork and lots of hydration, there are hydrotherapy things people can do at home to increase circulation and improve recovery. There is obviously nutrition as well. There are lots of different ways we can do that. Obviously the first thing is prevention too. If it is repetitive overuse, we want to look at how we are using that limb. A common one is that cyclists will get neuropathy in their hands because of how they are positioned on the handlebars, right? So, they will get stress on the nerve from pushing or holding on the handlebars for too long. For something like that we want to look at how we can adjust the bike side up so that their pressure is reduced or maybe we are having too much pressure on our hands because we don't have enough core stretch to hold our body up on the bike. There is something to be said there for the prevention aspect as well, but it ends up being very sport specific, for sure.

[13:37] *Cassy Price*: Okay, cool. When we were talking about balance, falls and stuff become more common the older we get. I was wondering if that also plays into neuropathy with age.

[13:55] *Dr. Tracey Teasdale, ND*: Yeah, so, there is a few things that are going on with that question. It is a little bit more complex than why do we fall when we get older or why is it easier to fall when we get older? There is a couple of things. The first one is we generally lose lean body mass when we get older. I always blank on this data which drives me mad, I wish I had it tattooed on my forehead or something so I don't forget but it is a lot more than we would think for years. I think it is 3-6% per decade but don't quote me on that. I will have to get back to you. We lose our lean body mass as we get older at a high rate if we are not taking active steps to maintain it. So, with reduced strength there is also reduced mobility and reduced motor coordination, so the way that our muscles talk to each other and the way that talks to our brains starts to deteriorate as well. That is one aspect. The second aspect is that as we get older, we also clinically we tend to, our diet tends to decrease a little bit in terms of quality so we are not necessarily getting as good a nutrition as we were before and the biggest one there is a vitamin called B12. So, vitamin B12 is very important in nerve system function. As we get older it gets really harder for us to absorb it. So, there is a decrease in body mass and there is reduction in nerve health as well. Then our brain ages too so it doesn't quite work as well as it used to. So, there is a couple of things at play.

[15:36] *Cassy Price*: Can supplementing the diet with protein and B12 as we age help to reduce those risks?

[15:44] *Dr. Tracey Teasdale, ND*: For sure. I'll talk about protein first and then we will talk about B12. Protein, we tend to eat less of it as we get older, I see. We also tend to develop something called leucine resistance. So, leucine is one of the amino acids in protein and it is really important for stimulating our body to grow or repair muscle. So, as we get older our body becomes less sensitive to leucine, so we need more to create that same response. So, when you are 70 you need way more leucine than you did when you were 20 yet we tend to be eating less protein when you are 70. So, that is really an important aspect in terms of maintaining your balance and coordination. The second part was the B12 itself. B12 is a really cool vitamin. It does really interesting things especially with respect to nervous system function and energy and things like that, but it ends up being really finicky in how it gets absorbed. So, we need to have enough stomach acid in our stomach to allow our body to release something called intrinsic factor and then intrinsic factor then binds the B12 and that is how we absorb it. As we get older, we make less intrinsic factor and we also have less stomach acid so then we are less able to absorb the B12. Oftentimes older patients and older athletes might benefit from a B12 supplement or possibly an injection as well. The trick with those is that supplemental ones are the ones that is either a drop or a lozenge that you suck on, that will bypass the whole stomach acid/intrinsic factor issue and just get absorbed across the oral ICOSA or

an injection can be done right into a muscle and injections are fun because we can do them right around where the neuropathy might be presenting to.

[17:48] *Cassy Price*: So, what blood levels of B12 would you look for if you were doing testing to assess if someone is adequately prepared to prevent those types of issues?

[17:59] *Dr. Tracey Teasdale, ND*: Yeah. I do test B12 frequently and the issue with it is that it is not a super sensitive marker. So, often times patients will be in the low-end range and it will look like they are fine but usually we would like them to be in the mid to high range of their blood levels. It depends on the lab that you have it done in. In some Canadian and US labs use different values. So, basically you want to be at least in the middle of the range if not a little bit mid-high if that makes sense?

[18:34] *Cassy Price*: Absolutely. So, are there other nutrients or vitamins that you would recommend to help patients with either the absorption of these different nutrients that they need or additional nutrients that help to prevent neuropathy?

[18:49] *Dr. Tracey Teasdale, ND*: There are a few other nutrients and nutraceuticals that can be really helpful in terms of nerve health and their regeneration. I will just list off a couple real quick that are probably beyond the scope of the whole chat today but; omega 3 is really fantastic for modulation inflammation, curcumin is another really great natural anti-inflammatory and also has a bit of an affinity to the nerve system too so it can help reduce that inflammation which is great, alpha lipoic acid has shown a bit in research in terms of improve nerve rejuvenation of the myelin sheath. There are some other vitamins which deficiencies in them can result in neuropathies as well, the most common one beside B12 is B1 or thiamine. Then there are few others that again can help a little bit like acetyl-L-carnitine and acetylcysteine can be helpful as well. There is a little bit of research about those two. Usually, a comprehensive approach can be really helpful when patients and athletes are experiencing neuropathy or wanting to prevent it and keep their nervous system in tip top shape.

[20:00] *Cassy Price*: Do neuropathy and low-grade inflammation pretty much always go hand in hand or can you have one without the other?

[20:09] *Dr. Tracey Teasdale, ND*: Generally speaking, if the neuropathy is from damage there is usually inflammation associated with damage. Then if there is dysfunction as well. Dysfunction can occur without inflammation, but it is likely in there as well. I don't have MRI studies to confirm but I would imagine that there is definitely some inflammation happening.

[20:32] *Cassy Price*: That makes sense. Our mind is a pretty powerful tool and obviously when you are a high-level athlete your thought process is a huge part of your success and it can help with so many things, right, like modulating stress and your HPA access and all that. So, if there a role in using things like meditation practices and mind mapping type tools with your patients to help them with managing the pain that comes with neuropathy?

[21:08] *Dr. Tracey Teasdale, ND*: 100%. There is a couple of different models of how we experience pain and the newer, it is not that new anymore, but it is newer in being more widely accepted. Research is funny, we do research and then it take us ten years to put it into practice, so the research has been around for ten years and we are finally talking about it more. It is called the bio sigma social model of pain which means that it is not just our nervous system or the biology that can impact the way that we experience pain, there is also psychological factors and social factors. We can use the psychological aspect there in terms of the mindfulness ad meditation. We can do things

like visualisation. Some studies show that if you visualise your body healing and injury then you can recruit more white blood cells to the area to improve repair. There is also an older theory which is still fairly applicable which is called the gate control theory of pain. That means that our brain, if we were to understand and our brain was aware of every single nervous input that happened every second of every day it would probably explode because it needs to know what the air temperature is, it needs to know where you are, it needs to know if your heart is beating, it needs to know what you are seeing and what you are hearing. So, all of the things. It would just literally explode. So, it has a way to filter the things that aren't that important and sort of highlight the ones that are. So, what can open or close the ability of those signals to reach the brain are things like anxiety and depression and those kinds of things. Thinking positive thoughts will reduce the nervous system input to the brain and calm everything down. If we are more anxious, we feel pain more consistently. There are a few other factors there as well, but I think there is a huge role for the mindfulness and psychological support there for neuropathy too.

[23:20] *Cassy Price*: What are some of the other tools that you use when treating patients suffering from neuropathy?

[23:26] *Dr. Tracey Teasdale, ND*: I love using acupuncture. It is one of the main tools that I use in my practice when I had patients in the office. There is virtual care happening out here, so it is pretty hard to do acupuncture over the internet but when I have patients in the office acupuncture is my favourite way to roll. The reason that it works is that it actually can alter the way that our brain experiences those pain and those nervous system inputs as well. So, it can increase the circulation to the area which is really helpful. It releases local endorphins which help to reduce inflammation and reduce pain. There are a few other neurochemistry things that happen there as well. Long story short it reduces inflammation, increases circulation and it also alters the way that our brain will experience the pain. It can be really helpful in terms of modulating it. Sometimes we can then do something really fun where we hook electricity up to the needles and then we can impact the nervous system that way too but kind of confusing it a little bit by sending our own electric impulse instead of the nervous one or the one that originates in the nervous system. There are also some scalp acupuncture points that can be really helpful for effecting the neurology or somatic nerves as well.

[24:53] *Cassy Price*: Very cool. It is an interesting thing how the body all works together like that, right? All of the little points in our body which can affect such a big system. Well, I really appreciate you taking the time to chat with me today. I think this is such an interesting topic and I am sure there is a lot more we could explore within this topic, but I think this has been a really great overview. If our listeners would like to work with you, how can we go about doing that?

[25:25] *Dr. Tracey Teasdale, ND*: Yeah, the two easiest ways to get a hold of me would be following me on Instagram. My Instagram handle is @drtraceynd and from there is a link where you can access my website and book a pre-consultation there. There is also Facebook, so it is just Dr Tracey Teasdale ND on Facebook.

[25:50] *Cassy Price*: Fantastic. Thank you so much for taking the time to chat with me I really appreciate it. I think there was lots of great information in here for all of our listeners to utilise.

[25:59] *Dr. Tracey Teasdale, ND*: Great. Thanks so much for having me.

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Episode 69: Calming Neuropathy

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