How your genes impact your mental health, and how to use nutrigenomics to optimise mental health

with Emma Beswick

The MindHealth360 Show

Episode Transcript
Host: Kirkland Newman
Guest: Emma Beswick

Emma Beswick (00:04):

A really big difference between what we do and a lot of other genetic tests is this pathway analysis, and that is particularly relevant in mental health. So, people have been looking very hard for genes in the mental health area to understand or work out what is it that causes depression? What is it that causes anxiety, or schizophrenia, or addiction, whichever? They've not really been able to find a single gene, and that's because there isn't one. So, there are lots of different genetic changes that can all chip away and make a small difference.

Kirkland Newman (00:50):

Welcome to the MindHealth360 Show. I'm Kirkland Newman. And if you, your loved ones, or clients suffer from mental health issues, such as depression, anxiety, insomnia, poor memory, poor attention, mood swings, exhaustion, etc, I interview the leading integrative mental health practitioners from around the world to help you understand the root causes of these symptoms, many of which may surprise you, and suggest solutions to help you heal. If you like this interview, please do subscribe and forward to others who might find it helpful. If you want further information, please go to www.mindhealth360.com or find us on social media.

(01:28):

Emma Beswick, welcome to the MindHealth360 Show, and I'm really excited to have you here. You really are the go-to person to tell us about genetics, genes, and mental health, which is what I want to discuss today because obviously, I'm really interested in mental health for MindHealth360. Depression, anxiety, poor concentration, poor memory. And while I was researching this interview, because I don't know much about genetics and I have to say, it's quite daunting, there's a lot of information. And you feel that you have to be a biochemist to understand all this. So I'm really excited to sort of take a back seat and let you explain everything. But there is a huge impact on our mental health and the epigenetic component. So, the influence of our environment on our mental health, based on our genetic variants, essentially. And I hadn't realised that there's so much that you can do to adapt, to optimise your mental health based on your genetic profile. And your company Lifecode does this, you map all these genes, and you look at the nervous system, and you look at methylation. And you look at all the systems essentially, and how the genes interact with the environment, and how they'll predispose you to your environment.

Kirkland Newman (02:50):

And it's just a wealth of super, amazing information. So I just want to say that because I had it done myself. And I was just re-reading it and I thought, wow, this is such a treasure trove of information on what you can do to optimise your mental health through genetic factors. So what I'd like to do is just start by letting you explain in your own words, the link between genes and mental health. And what you think we should all know as lay people, and also, as health practitioners of the impact of genetics on mental health.

Emma Beswick (03:24):

It's a big question. Nutrigenomics is, I agree, a really, really fascinating subject, and it can cover almost any area of health. So the big, big, key, most interesting aspect I think of nutrigenomics is it's about what you can change. So your genetic code is fixed, and your genetic code and small differences in your

individual genes will make a difference in terms of how those genes behave, how they express, but that is only part of the picture. So we want to understand where that starting point is. And then, that will inform us how we are likely to respond to different things in our environment. So we all have these changes. We all have differences in our genes, so they are very common. And so that's a really key concept and a key thing to recognise, that this isn't about scary, really detrimental things that you can't do a thing about.

(04:40):

It's about small things that you can do something about that, in fact, are really empowering to know, because then you can take that action. So, when I started doing this about five years ago I mentioned it to people, and spoke to friends and colleagues, some people really got it and other people just thought it was a little bit strange. And I'd get this a little bit, maybe creepy, or maybe a little bit too personal response. But I think over the last five years, really very recently the public attitude towards this has changed. People just feel more comfortable with it. And also, the research has evolved in leaps and bounds, and there is so much information there to tell us and explain what these alterations can mean.

Kirkland Newman (05:44):

Just to summarise. So we basically have our genetic profile, and then we each have variations. Are these the SNPs that people talk about?

Emma Beswick (05:54):

Yes.

Kirkland Newman (05:54):

And so each person has completely different SNPs, or they can share similar SNPs. And then these SNPs will impact how you will react to your environment. Is that how it works?

Emma Beswick (06:08):

Absolutely. So an example, a really, really simple example that most people understand is, how people respond differently to caffeine. So for some people it's a real huge stimulation and it can make them really, really jittery, even a very small amount. For other people, it seems that they have a greater tolerance to start with. So, tolerance does change, and your genes do adapt to the caffeine environment. But there is also a starting point which means that just as a baseline, depending on just actually one very, very precise change in your genome, one little change. So one SNP, means that some people are very jittery and other people are not. So sometimes we come look at a single SNP, and it can mean something quite powerful on its own. And other times there are SNPs that may make a difference, and that difference might be quite small on its own.

(07:23):

But if there are other genes that surround it, that also have SNPs, it's the collective impact that pushes everything in a certain direction. So one of the things that we do, the official term is, polygenomics or polygenetics. And so we look at how genes do connect to each other. So it's how the genes connect in, and you mentioned biochemistry, sounds very technical, but I think most of us in the health profession

are used to the idea of biochemistry. Biochemistry is controlled by our genes. They make the enzymes, they affect how substances are converted and processed, and how we respond to them. And so, a really, really, big difference between what we do and a lot of other genetic tests, is this pathway analysis. And that is particularly relevant in mental health. So people have been looking very hard for genes in the mental health area to understand or work out what is it that causes depression? What is it that causes anxiety, or schizophrenia, or addiction, whichever? And they've not really been able to find a single gene. And that's because there isn't one. So there are lots of different genetic challenges that can all chip away and make a small difference, but they either require an environment that is detrimental as well, or other genes that also conspire to push that person's biology or biochemistry in that same direction. And so, it's really, really useful to understand that context and to look at how they connect.

Kirkland Newman (09:25):

That's so interesting because you think about functional medicine as taking into account the environment and the impact of the environment on your biochemistry. But what you're also saying is that there are two big environmental factors. One is your actual environment. And the second one is the interaction of all the different genetic polymorphisms essentially, and how they interact. So in terms of how you help people with mental health or how to understand the genetic components of mental health, and I know that there's always been that silver bullet or the holy grail of finding that one biomarker for depression or the one genetic, the one gene that would explain depression. As you say, there is none, it's just a series, a combination of things. So in the test for instance, that you do, I know you have a whole nervous system test that actually looks at the pathways for the various nervous system and then your transmitters. Can you talk us through that and how, if one's trying to understand why am I depressed? Or why do I have a tendency towards anxiety? What would you look for in the genetic profile and background to explain that?

Emma Beswick (10:41):

So one of the challenges that the medical profession that the health profession has, is that these labels are quite imprecise. So when we talk about anxiety, anxiety can lead you to different imbalances in a person's biochemistry. So in one person, it might be about low GABA. So GABA, video transmitter, which is known to be quite calming. Say some people naturally, their genes conspire to mean that they have either low GABA levels or that they don't respond as sensitively to that GABA. So that's one reason that some people might feel anxious, but that's just one. And another might be related to serotonin. It could be too much serotonin. It could be too little serotonin or it could be for dopamine.

Kirkland Newman (11:44):

So you can actually be anxious if you have too much serotonin? Interesting.

Emma Beswick (11:48):

Yes. And we think of serotonin as being good, don't we... because, generally we say low serotonin is bad. It's associated with low mood, and depression, and anxiety, but you can also have too much of a good thing. Some people are very sensitive to serotonin, and they have a narrower range of tolerance or comfort. So when we think about levels of things, for some people, their actual range that is comfortable for them, that feels healthy is actually narrower. So if the serotonin is, an example, is to spike above that, it would feel uncomfortable. And that could be an aspect of psychosis, for example.

Kirkland Newman (12:44):

And then, dopamine as well.

Emma Beswick (12:46):

Yes. So in a similar way, people may be more or less sensitive to dopamine. Some people, we talk about adrenaline junkies, as a way of describing people who thrive on stress, then they want the thrill and all of that. And some people are really comfortable with that. And they would say that it makes them feel good, but other people would feel very, very uncomfortable. And that it could be just a bit too much for them, at a much lower level. So why is it that people have these natural tendencies? And we know that there are environmental and life events that can contribute to this, but there's also a starting point in terms of what your baseline is genetically.

(13:42):

One of the problems with these labels, because they aren't... basically it's the same label for a condition, but a very different root cause. For example, someone is depressed, they have low moods, and they go to a doctor and they talk about anti-depressants...

(14:04):

Most of the time, the first plan of action is to talk about SSRIs or things that will raise serotonin. But if we end up studying the genetics, we can tell reasonably quickly, and get a much more accurate idea of, "does this look like it's a slightly severe serotonin related issue even, or are we looking completely in the wrong place? Does the serotonin pathway actually look very balanced? Is it more likely to be a dopamine or a GABA related thing?" And that can mean that the 'do no harm' mantra is much more likely to actually be stuck to because it's possible to push someone further in a direction that is already wrong for them, or just miss the point completely.

Kirkland Newman (15:06):

Completely. And I think in terms, I know that people are using genetic research to target pharmaceuticals more effectively. And to really use it, whether it's pharmaceuticals for things like cancer or diabetes or whatever, or mental health. They're really trying to target pharmaceuticals based on their genetic knowledge. But I think in the same way that they're doing that, we can also use the genetic information that we have to serve patients. And in a more functional way, in a more sort of integrative way by looking at what are the lifestyle factors, the nutritional factors, the stress factors, and the supplements that may or may not work. And I know that in your reports, you're very good about incorporating that level of information and saying for your genetic type, you would do better with this supplement, or with this type of nutrition, or with this stress sort of habit. So talk us through that a little bit. How do you use it to serve?

Emma Beswick (16:13):

So that's a really good point actually, because that is what we are about. So because it is nutrigenomics, it is about nutrition and lifestyle. So an important part of this biochemistry is understanding what nutrients, or what co-factors support a certain pathway. Or alternatively, might divert a certain pathway in an undesirable direction. So for example, with serotonin, we need tryptophan. The amino acids, part

of a protein, is a starting substance. So if someone has a really low protein diet and is eating a lot of carbohydrates, but not much protein, they might just be low in tryptophan to start with. And so, the chance of making a good optimal healthy amount of serotonin is lower anyway. When we put that together with the genes, the next step in converting tryptophan. So tryptophan is converted it's a 5-HTP, which people will have heard of as a potential supplement as well. There is a gene in the middle of that, that facilitates that conversion. And we can look at that gene and say that this person- where is it on the scale? Is there a SNP that reduces that gene expression? That means that that conversion activity for that individual is not so good or efficient. And therefore, we have some options with regard to supporting it.

(17:57):

So those options could be about firstly, making sure tryptophan is available. Secondly, looking at co-factors like iron, like folates, for example, that support that SNP. And then possibly, deciding just to work around that SNP and give someone 5-HTP. Maybe as a proof of concept to say, it looks like this where the block is. Let us try 5-HTP to see if we can get a fairly rapid benefit for that individual. And if that does work, then we can work backwards from that, and fill in with the co-factors and the tryptophan.

Kirkland Newman (18:42):

And I presume that for each neurotransmitter, you have a different go-to solution, like you've just described. So for GABA and glutamate, for instance, I know that if you have too much glutamate, it can be very excitory, and lead to anxiety, and also over the long-term, neurodegenerative diseases. And for instance, dopamine, presumably you have pathways to either lower or increase dopamine depending on what the profile is. So is this something that you guys do at Lifecode? That you actually look at the individual pathway and I think it is, and then say, okay, well, this is what we recommend that you try? And talk us through the other ones. So dopamine, glutamate, and GABA, and maybe adrenaline and acetylcholine, the key mental ones.

Emma Beswick (19:35):

Yes. I absolutely love the GABA, I think partly because I personally have got SNPs on that pathway that really resonate with me. So I think when I've developed these tests with my team, I've always withheld taking a sneaky look at what my genes are, until we've got a really, quite far down the rate of designing the reports. But then, looking at my GABA results, just explain so much about how I felt in my life. So GABA is this calming neurotransmitter. There are two real key areas that can affect people's GABA system. Like you say, glutamate is converted to GABA. So you start with an excitatory neurotransmitter, which is the glutamate and that's converted if things are working correctly, or smoothly, to the calming GABA. And if that conversion is disrupted, and that can be a combination of the genetic change.

(20:48):

So on the GAD gene, so there are SNPs that are common on that gene. That means that they work more slowly, and or more quickly. But if they work more slowly than that means that that person is likely to have less GABA just naturally that's their starting point. The co-factors that's needed to support that, the biggest, most important one is B6.

Kirkland Newman (21:16):

B6.

Emma Beswick (21:16):

Yes. So if B6 is insufficient for whatever reason, and there are a whole load of reasons that might be the case. Of other genes that mean that some people are naturally low in B6, for example. But if someone has insufficiency of B6, then that is another thing that is going to push back that conversion. So the balance between the glutamate and the GABA is tipped towards the excited rather than the calm.

(21:51):

And so, if we know there is a weak point on the conversion gene, the GAD gene, then we can at least assess that person's B6 status and optimise it. So often we fix things, it's not about pushing as much as possible of this helpful substance into the system, but it's finding out if that person is actually low or insufficient in that nutrient. And more often than not, it's these sub-optimal levels that are conspiring with the weak genetic points to cause those imbalances. So it's not about pumping huge doses of things in. It's about more subtle changes to support those pathways. The other main genetic impactor on the GABA pathway is a receptor. So with the neurotransmitters, they all have receptors. And a receptor is like the cloak that the substance connects with. And they connect together and that's what triggers all the effects of that substance, that neurotransmitter within your system.

(23:14):

And so if there are differences in the receptor, then that person, the cloak might not fit so snugly. So it's not going to have the same magnitude of effect. So it's a little bit loose. The connection's loose, so it's not so effective, not as much of the power is going to get through. And so that GABA messaging is just weaker. Even if the person has the same amount of GABA as the next person, they are responding to that differently. AND that is a huge anxiety-related situation.

Kirkland Newman (23:54):

So it's really tricky because you take anxiety and you can say, okay, well that could be a result of low GABA. But the low GABA could be a result of not making enough GABA. And that could be the result of sort of nutrition and lifestyle factors and, or it could be a result of the genetic SNP. Or it could be that the receptor isn't quite equipped to receive the GABA. And therefore you're still low in GABA, essentially. And I guess if that receptor is having a hard time, is that a genetic, or lifestyle factor, or both?

Emma Beswick (24:31):

It's both. So there is a very strongly indicated SNP on one of the GABA receptors. That has got an enormous amount of research showing the association with generalised anxiety disorder, social anxiety disorder. So we know that actually on its own, that is a really powerful message if we see that SNP. It's not determined, it's not inevitable, but it is one of the more powerful indicators. What we do see often with that as well, it occurs frequently with alcohol use, because alcohol binds to the GABA receptor. And to the individual, what that means is it's like GABA, alcohol is having the same effect as the GABA. It's nudging the real GABA out and snuggling in and just giving that person that calming effect. And so that individual completely inadvertently, they wouldn't have understood that this is their biochemistry, and

this is their genetics, but they've developed behaviours that really, really fit with that scenario. And that might be problematic as well.

Kirkland Newman (25:58):

I presume with all addiction, it's the dopamine pathway, the reward pathway, but also the GABA pathway, and the serotonin pathway. And these pathways are essential to addiction. And I always say addiction is really; you take substances or indulge in behaviours to make yourself feel better. And to address whether you're feeling anxious or depressed or low or lethargic. And it's really our own individual ways of trying to regulate our own biochemistry. And we don't do this consciously, but it's like, well, this makes us feel better. So therefore we're going to do that. And then these things can become addictions. And so, really if we went downstream and addressed the biochemical imbalances to feel better than I think that would really do a lot of good to the world of addiction. And if people could regulate by balancing their biochemistry, it would be a whole lot better. And I think the complicating thing though, in your work is that there are so many of these SNPs and so many different variants. And presumably not all, I mean, there are probably thousands that haven't even been discovered or studied yet. And so, your work is you have a team of people who are constantly doing the research behind this. Talk me through that process.

Emma Beswick (27:25):

So what we do or what we have done, when we decide to develop a new panel is, so say we decided when we looked at nervous system, so we've had the support for about three years. So we decided that this is the theme. This is the objective. This is what we're trying to help with. And then we will do very broad based work to identify these are the key pathways. So when you say serotonin, dopamine and adrenaline, acetylcholine, GABA, that's really where we would start. It's possible to go on forever. It really, really is because there are new things coming up all the time. There are things that one piece of research might claim has a certain effects. But until there is a weight of evidence, then we wouldn't consider including it in a panel.

(28:30):

So a big part of what we do, we don't do original research, but we review research. And we are looking for things that are common. So they're not things that are one in a million. They are things that affect many people. So it might be 20% of people. It might be five, it might be ten. The minimum is 4%, that's the cut-off. And indeed that's the definition of a SNP, actually. It has to have 1%. So at least 1% of the population. Now, different SNPs occurred differently in different ethnic groups as well, but it's roughly a 1% cut-off. It's got to occur at least 1% in one population, if not altogether. So it's got to be common. It's got to have a weight of consistent evidence. So although there may be some research that is contradictory. If the bulk of the research, and it's good research. So we have methodologies to review this, give us the same consistent interpretation. Then that means that it's a candidate for including.

(29:53):

And then, a third condition is, so say, well, what is this telling us? How is it informing the picture? And is it contributing something that can be acted upon in terms of a therapeutic action? So we're not just really interested in things that firstly are determinant. So if it's something that means it is inevitable that a person would develop a certain condition, then that's not the sort of genetic testing that we do. There

are other places for that. And we would direct people to those places and those resources. So we are looking for things that lend themselves to therapeutic adjustment and adoption.

Kirkland Newman (30:48):

Yes. So one that would be like a hundred percent genetically predetermined that you wouldn't deal with.

Emma Beswick (30:54):

So something like Huntington's disease. For example, currently, there is nothing that can be done to prevent that happening if someone has the genetic variance that is associated with it. So that's called penetrance as well, it's a hundred percent that will happen to that person at some point, there is nothing we could do. We could do some things to relieve symptoms, but it's so little, it doesn't really fit into the medical model, the functional model that we work with, or the nutritional model. So we know our limits and we have boundaries to where we work within and without. But no, we will direct people to the relevant resources for those things. And in the UK, the NHS is an amazing resource for rare genetic disease. So, several places to go.

Kirkland Newman (32:07):

They can treat it. So what you really do is you're all about optimising the lifestyle and nutrition of people based on their genetic sort of individual...? And the beauty of this is really about personalised medicine. For your particular genetic makeup, what works and what doesn't. And if you, for instance, had somebody who came to you and who was suicidal, what would you look at genetically? What would be the go-to SNPs that you would look for in the pathways?

Emma Beswick (32:39):

So firstly, we work with practitioners. So in terms of our model of operating, we're in the middle of the wheel, and then we have all our practitioners. So we work with psychiatrists, we work with nutritional therapists who are trained in mental health. We often work with integrative practices as well. So there are multiple disciplines and skills and knowledge all contributing to that picture. So, for something as serious as that, it's not something we would directly support or even try to support. We've made sure that we were part of a support group. So we were advising the psychiatry team and the nutrition team about this. Again, the suicidal aspects, there are different reasons why people might feel suicidal. So some of that could be related to deep depression. It could be related to low serotonin, or it could be related to a psychotic type condition.

Emma Beswick (33:56):

So what we are looking at is beyond the disease label, to understand where the imbalance, where the weak points in the biochemistry are most likely to be. And therefore, what lifestyle and nutrition interventions could be made to support that person? And sometimes it's a pharmacological, medical medicine intervention as well alongside. But certainly, some of the psychiatrists that we work with, we're very, very lucky there are not many practitioners, who have this whole view. Who are able to, they are qualified and experienced in how they prescribe, but at the same time they understand functional medicine. And they can also compliment that with the nutrition and lifestyle side of things. And that is really where we sit at that crossroads.

Kirkland Newman (35:00):

And that makes sense because somebody, I know there's a high correlation for instance of low cholesterol and suicidality, or aggression. And so you would take that low cholesterol and say, okay, is it the diet? Is it the breakdown of fats? Is it a liver function? Is it a gut issue? What is causing this low cholesterol, which is then leading to this mental health issue? Where would genetics come into that piece? Where you're looking at all these different factors that might be causing the low cholesterol, for instance, that might then be leading or, or be behind the sort of suicidality?

Emma Beswick (35:38):

So we would look at diet. So in functional medicine, as you know there is a method which looks at our whole case history. So it's that person's family history, their health history, their current environment, what's going on in their life. And with something like low cholesterol, straight away, this connects us also into steroid hormones. So cholesterol is the start point for making testosterone, estrogen, progesterone. And there are huge, huge connections between those hormones and the neurotransmitters. So sometimes it's not the neurotransmitter pathways per se, that have anything particularly untoward in them. It's more that maybe the sex steroid hormones are out of balance. Certain phases in people's lives, those hormones are much more volatile than other phases. And someone might have been mentally very healthy and thriving, and then they approach menopause, for example all kinds of strange things start happening, and they don't understand why this is.

(37:06):

So we would look then at combining an analysis of the hormone profile, and the diet, and the neurotransmitters. I think one important thing is to avoid going down all these different rabbit holes and being overwhelmed with so many things. The way we teach people to interpret the genetics is to look holistically. So one of the reasons we present things in the pathways is sometimes you could just look at a pathway, almost without getting in focus and see there is a lot going on. We use colour-coding, it's a fairly crude process or crude method, but actually, if you see a page with a lot of red and yellow on it, that indicates there are a lot of genetic variances on that pathway. And they don't necessarily balance each other out. It's just giving you that very, almost instant knowledge that there is more likely to be dysfunctional imbalanced there. Or that person, for that pathway is more easily going to be knocked out of balance.

Kirkland Newman (38:28):

And I think that's super helpful having done the test myself. And seeing, if it's green, it's good. And then if it's red or yellow, it's not so good. And you test, so you do genetic profiles on hormones, on the detoxification system, on nutritional status. Talk us through all the different areas that you look at, that then will have an impact on mental health. We know that detoxification pathways, and nutritional pathways, and hormone pathways, and neurotransmitter pathways will all have an impact on mental health. So how many of these do you do? And tell us the key ones, the ones that impact mental health.

Emma Beswick (39:13):

So, first of all, we have a profile called nutrient core. And nutrient core, I think, every single person would benefit from understanding these core things. So that includes, for example, the vitamins, essential vitamins. Vitamin D, which is hugely being talked about in the last year. So vitamin D is so

essential. It's been talked about in the context of immunity. Immunity is related to mental health anyway. But vitamin D is so important for supporting serotonin synthesis, mood. Why do some people experience low mood in winter weather? It's really one of the most simple concepts. But that nutrient core looks at genes that impact vitamin D levels., and you can see why the same two people who have similar sunlight exposure, similar diets and lifestyle, but very different vitamin D status. Because genetically some people can store and hold their vitamin D better than others.

(40:27):

So for certain individuals, if you know that is a weak point, then you can be proactive about supporting that. But it means that you can be focused, and rather than having to do everything right, and be overwhelmed by every single health message that is out there. It enables you to identify what the priorities are for you. Say for me, it might be vitamin D, for you it might be folate. So I think that's helpful because people do get overwhelmed if you ask them to do too much. And who can be perfect? Whereas, if you know actually these three things are my top three things. And when I go to the supermarket, I know why I'm choosing berries. I know why I'm choosing olive oil. I know why I'm choosing broccoli. It's not just that I've been told, but I know that they used three things. If I only do those, they are going to be so much more beneficial than a different three things. It makes it more fun.

Kirkland Newman (41:43):

So it's such a useful tool, I must say. And then the hormones, you also do a hormone panel and a detox panel. And how do those impact mental health in terms of the genetics?

Emma Beswick (41:57):

So the hormones for example, huge interactions between the sex steroid hormones and neurotransmitters. So, for example, we know that progesterone helps support GABA. We know that estrogen can help support dopamine. So if people's sex steroid hormones are out of balance for whatever reason. And again, the genetics can tell us these tendencies, these innate natural start points. Then we can understand why and how that can impact the neurotransmitters imbalance as well. It may be that some people's hormones are actively complementing their neurotransmitter profile, for a whole period of their life. And then something happens. It could be pregnancy, for example. Huge time of hormone shifting. And we know that some people experience postnatal depression, big hormonal shift. Huge plummet in estrogen . Guess what, that's like pulling the rope from under your dopamine.

Kirkland Newman (43:21):

So, is it just dopamine or also serotonin?

Emma Beswick (43:24):

Yes, serotonin as well. When you look at them, you could down the pathways put the hormones as co-factors and health posts. Kind of embedded in those neurotransmitter pathways. They are so interrelated. So I think hormones is absolutely huge. And again, if someone is depressed and they go to the doctor, how can they possibly cover all these topics in 10 minutes? The SSRI is the more realistic option in that period of time, but in functional medicine, we have more of a, some people would say, a luxury of exploring that connectedness.

Kirkland Newman (44:17):

It is a luxury, I think, but one that if you're looking at your long-term health, it's worth it, if you can, and if you have access to it, it's really essential. What about the detoxification profile?

Emma Beswick (44:30):

Yes. So that is so important. So, firstly inflammation. So if people are toxic... So we all have toxins, we create toxins ourself in our bio chemistry that needs to be removed, but we are exposed environmentally to a huge amount of toxins that disrupt our biochemistry. If our detoxification system has weak points in it, which everybody will have some weak points, we just hope that they're not acting in the same place and in the same direction. That we can look at detoxification pathways and they can understand how people would have greater need for something like glutathione, the master antioxidant. Because their pathways just are not as efficient and maybe struggling more. So we want to nurture those pathways, and we want to just give them that lovely cushion of support. So they've got the best chance of doing that job.

(45:47):

And we would also look at exposure. So for some people being exposed to certain specific toxins is far worse than it is for other people, because they've just got less resilience from a detoxification perspective, to be able to process it.

Kirkland Newman (46:10):

Genetically.

Emma Beswick (46:10):

Yes, genetically. Absolutely. So, we all know some people who seem to be able to get away with a lifestyle that perhaps isn't healthy. And you just go, "how can they do that and still be energised and thriving?" And I think eventually it will catch up with them, but other people are much more vulnerable. And it's just that the wrong thing has entered their environment. They've been exposed to something that they've always had a particular vulnerability to, should it happen. And in some people it might never happen. But if you can understand a bit more of that, again, that can help people make decisions in an informed way.

Emma Beswick (46:58):

It might persuade them to drink less, to have less sugar. And again, I think education is the key. They need to understand why, then they are much more likely to comply with it, and do the right thing. Rather than just feeling that you've been preached to, or nagged, or whatever the scenario might feel like. So I think if you understand your weak points, then you feel empowered. And that's where we want to get to. And if the toxicity is high, then that leads to inflammation. And we know that inflammation in the body is translated to inflammation in the brain. That has no end of negative effects on mental health. And so, it's all connected. And I think the challenge is being able to make sense of everything. We sometimes get approached by people to say, can you test everything?

(48:09):

I just want everything possibly tested, and you to tell me what to do. And my response to that is it's not possible at the moment to do that. And it may never be possible. It's a bit like saying, go and have a CT scan and check for everything. I want the certainty to know that everything possible has been assessed. It's quite difficult to do that, but we are looking at the bigger thing. That's what we're focusing on. We're looking at the things that are most likely to make a difference and the things that can be most effectively counterbalanced.

Kirkland Newman (48:56):

And so for instance, if you go back to the sort of toxicity levels. So if you have mould exposure, depending on your genetic SNPs, you may be fine with mould exposure and it might not cause any sort of neuroinflammation. Or depending on whatever genetic variant you have, you might actually have huge neuroinflammation, which will cause then, your degeneration, and depression, and anxiety, et cetera. And so, that's what you look at, you say, okay, well, you've got these SNPs that will hamper your detoxification. Therefore, you're more prone to inflammation and neuroinflammation, therefore you really need to be careful about this.

Emma Beswick (49:35):

Yes. And something as simple as pesticides, for example. There is a gene called PON1 that breaks down pesticides. It also breaks down oxidised fats. So we get a lot of oxidised fats in junk food, and snacks, and crisps and biscuits and things like that and oxidised cholesterol as well. Some people cannot process, or detoxify or break down those substances very well. So the more exposure they have to those things, the more damage those things, that those chemicals are going to cause in their system, the more inflammation. And so, simple things like eating organically, being informed about which foods really are more of a problem if they aren't organic, or if they are washed, or prepared in a certain way can make a really big difference.

Kirkland Newman (50:45):

Yes. That's why this is such important information to have at your fingertips. And there are a few of these genetic variants out there that are in the popular vernacular that we know have an impact on mental health. So things like the COMT SNP, which affects dopamine and might be behind ADHD. And the MTHFR, which is from folate metabolism and how that might impact your serotonin levels. Presumably you look at those and what are the top five genetic variants? That's probably a silly question because it's so complex, but for somebody thinking, okay, well, I've heard about the MTHFR, or I've heard about COMT, have heard about PMT, or APOE4 gene, which predisposes you to Alzheimer's for instance. Presuming you look at all these, but what are the top ones and how would you explain those to the general public?

Emma Beswick (51:47):

Yes. I cite them all. I call them the big ones, say they are these big genes. And by that, I mean the potential impact is quite large for those genes. So for example, COMT. COMT I think, is my top gene in terms of mental health, but also hormone metabolism. And it's at the crossroads between the two. So COMT breaks down dopamine, noradrenaline, and adrenaline. And people can have SNPs on the COMT. There were two particular SNPs that we look at. And that can tell you very reliably, whether that gene is likely to work more slowly, or more quickly, or whether it's kind of in the middle. Because it breaks

down those excitatory neurotransmitters. If it's slow, then those individuals are more likely to have more of those neurotransmitters in their system. And not on its own, isn't necessarily good or bad, because it's, well, what is their comfort zone? And what is their tolerance for these things? How much are they making? What is their environment doing to also stimulate these things?

(53:12):

However, it can suggest, for example, if it's slow that it is more easy for those people to push their dopamine and their adrenaline, beyond a healthy tolerance level because their starting point is higher. And so, some people would really, really resonate with saying they can easily feel quite overwhelmed, and quite stressing more so than, their partner or their friends or whichever. And they recognise that trait in themselves. And because it also metabolises estrogen s then, I call it the crossroads between COMT. The crossroads between those two types of substance. And so, fluctuations in estrogen impacts, dopamine and adrenaline directly. So when people have high estrogen , that means they're more likely to have higher dopamine, high adrenaline. Being nearer to that tipping point of being on the one hand, maybe very productive, very focused. But if it just pushes too far, then they literally feel like they've blown. So that's a slow COMT impact.

(54:38):

The opposite is fast. Although, that in some tests is represented as being good because it's the default. Fast COMT can mean that dopamine is literally whipped out of your system very, very quickly, basically. And so that lends itself to a low dopamine type of person. It's one factor, as we've said that the state of all the other things to look at in the pathway. But COMT is a very, very powerful indicator on its own. As to whether someone has that low/high dopamine and disposition.

Kirkland Newman (55:24):

And the low dopamine presumably, is behind things like ADHD and addiction, and extreme behaviours and thrill-seeking behaviours, because you're trying to boost the dopamine and the adrenaline levels. So that's your top one. And what about the others?

Emma Beswick (55:43):

Yes. So MTHFR is important. So MTHFR activates folate. So when we eat folate, it's a mixture of different forms of vitamin B9. And MTHFR converts and activates and creates this most potent bioavailable form of folate. And it's that folate that helps us make neurotransmitters. It helps us break down neurotransmitters. So it's kind of a regulator of our nervous system, in that respect. And you can have SNPs on MTHFR that lower its activity. So a slow MTHFR would mean that maybe, you would not have as ready supply of folate to support your nervous system. And so, you might not be making enough dopamine and serotonin. And the therapy for that is to make sure that you have more folate coming in. So to know about your MTHFR is really, really valuable information because you can quite easily compensate for it. So the things that you would compensate with are either food. So green leafy veg, citrus fruit, beans, all really, really good folate foods. You could also consider taking supplements. That's the other concentration.

Kirkland Newman (57:21):

And how about the COMT gene and how you would... like the lifestyle or nutrition or supplements that you would advise to sort of balance out that COMT SNP?

Emma Beswick (57:30):

So the COMT needs careful nurturing because it's easy to overwhelm it. So when we think about the whole picture, COMT is at the end of the process. It's the removal of all these neurotransmitters or hormones. So firstly, it's about considering what is the load on that COMT process? What are we expecting of it? How much are we putting through the pipe for it to process? Is that healthy? Is that reasonable or is there just too much being created in the first place? So that's one consideration. And then, from the nutrition perspective- COMT is a methylator, it's a big word, the methylation word. So methylation is quite simply the addition of a methyl group and that's a carbon and three hydrogens. What COMT does, is it deactivates the neurotransmitters or the hormones by methylating them. So it's just adding this other chemical group to the estrogen and it deactivates it in that way.

(58:48):

And so that's a really, really important step. Those substances are still there, but it's as if the pin's been stuck in them and then deflates it and they are no longer fizzing around and doing their thing. So you can help that to happen by making sure that you've got a good supply of methyl donors or methyl groups. The main substance that supplies that is a substance called SAMe. And that is made in your body by a process called, it's methylation again, but that needs B vitamins and magnesium- all the key nutrients to help your system make its own SAMe. And then that SAMe will support COMT. Another thing that is useful is magnesium. So magnesium really compliments that whole process of deactivating the neurotransmitters. And if you think about magnesium, we associate it with calm, don't we? Epsom salt baths get that magnesium into your system. It will be calming and it's helping those excitatory neurotransmitters, like adrenaline, be shunted out and move on. It's like, "you've done your job, adrenaline, don't need you rattling around the system anymore. I'm going to help you out with the magnesium, going through that COMT process."

Kirkland Newman (01:00:25):

Absolutely. And I think also things like saunas, infrared saunas can be very helpful for detoxifying excess adrenaline and cortisol. I have the COMT SNP myself, and I always find that to me what really shifts the needle is having a sauna and getting rid of those stress neurotransmitter hormones. In terms of the other key mental health... I know a lot of people are concerned about the APOE4, which is the Alzheimer's gene. What would you say about that? And are there others that we're missing, and presumably, it's not just that one, it's a whole basket?

Emma Beswick (01:01:00):

Exactly. So the APOE has got quite a negative publicity, and in some ways quite rightly. So it is strongly associated with Alzheimer's disease risk. So late-onset Alzheimer's. We believe the mechanism of action is related to cholesterol transport and the inability to move that cholesterol out of harm's way really, so that it's part of the brain inflammation. In a non-technical way, I think it's this kind of clogging up of the brain. But it's only part of the picture. And in fact, when we considered testing for APOE at first, we were in two minds about it, because, well, can we do anything? As functional medicine practitioners, can people do anything about this risk? And then I've seen him several times actually, Dr. Dale Bredesen.

He's one of a growing number, actually, of very, very respected practitioners who works in this field and researches Alzheimer's and has shown that nutrition and lifestyle can make huge differences in terms of progressing Alzheimer's, or preventing it, or slowing it down.

(01:02:40):

And so, we were convinced by that body of work, that it was something that should be reported. But I guess one of the big things about genetics is really, really important to think about, is people's perception and people's attitudes towards it. And how are they going to receive this information? And this is a job of practitioners as well when they're considering who is going to actually benefit from knowing this and who isn't. So some people absolutely are not really good candidates for doing genetic testing, because it might actually make them really, really worried, and that it's going to be more detrimental to their health than helpful. And so, when we are talking about genetic testing and making a decision, as to whether to do it or not, it's important to assess that part of someone's personality as well. To say, are you prepared for, if the result is this? How are you going to respond to that? Are you going to see it as empowering? Or is it actually going to cause anxiety? So those are key considerations.

Kirkland Newman (01:04:05):

They really are. But I would say, there's so much that we can do. So much of it is epigenetics and how we handle. And I always think more knowledge is better because then, if you know, you can then address, you can make your lifestyle tweaks that you need to make, and take the supplements and focus on nutrition. It just empowers you to know how to optimize your own health.

Emma Beswick (01:04:27):

Yes, that was exactly the conclusion we came to when we thought about opening. So, we did think about these other... should we, shouldn't we? And then we very firmly and confidently came down on the side of "absolutely we should." It's part of what we do. It does fit very well with functional medicine. And for all those reasons that you said.

Kirkland Newman (01:04:54):

Completely. And I think.. is there a percentage that we know that each... if you have the APOE4, that this is your percentage chance of getting it, but this is also the epigenetic percentage? Does each SNP have a percentage attached?

Emma Beswick (01:05:11):

So they do, and here is an example of how that information is presented. So sometimes there is almost an ulterior or a motivation in research to say, we've discovered this thing. And it has a really big effect because that makes the research more interesting. And there is this great discovery, but often with the APOE, the risk factor is quoted as 14-times the risk compared to the less risky genotype. And then you've got to say, "well, what was the risk in the first place?" You know, relative risks can be used in quite a dramatic way. It's not really necessarily that helpful. And it's also an average relative risk. So what we're talking about is within that, say acknowledging there is an increased risk, but that increased risk still isn't the same for everyone. And what we're aiming to do is push it down the scale anyway. But the main, the usual relative risk that is described as something like 14 or 15 times the risk. But we look alongside. So our APOE report actually looks at genes that impact toxicity, atrophy. So BDNF, it was

described as the plant growth for your brain to me. And it's really stuck, but BDNF is how do all these nutrients get to your neurons? It's the supply, it's literally the roots, that supply all these nutrients.

Kirkland Newman (01:07:16):

BDNF is an enzyme, but it's also a gene. Is that correct?

Emma Beswick (01:07:21):

Yes.

Kirkland Newman (01:07:28):

Brain-Derived Neurotrophic Factor.

Emma Beswick (01:07:28):

And actually, most gene names are the same as the protein name that they code for. So the gene is the code; it's like the instruction manual. And then the protein is the result of that instruction. So that the gene is telling the body how to make the protein. And most of the time the gene name is the same as the protein. And it is used interchangeably. Not always the same, but I'd say about 98% of the time, it's the same. And often, it's meaningful as well. So often the name is very descriptive in terms of what the gene or what the protein does. So I really love that about it, because you don't have to have encountered every single gene before. You can sometimes look at it like it's all language. You can see the word and you can break down the word and understand, "Oh, that's what it's about."

Kirkland Newman (01:08:32):

As I said, I could go on for hours and hours and hours, and maybe we should do a part two because it's such a minefield in terms of the amount of information. But I think, in terms of just the basics of how your genetic polymorphisms can impact mental health, I think you've done a brilliant job covering that. And is there anything you would want to close on? You've been incredibly thorough, but is there anything that we've missed out that you would want to mention?

Emma Beswick (01:09:02):

I think the overarching benefit for the person who is having the test is, for many people it's a validation of what they know, or what they knew but maybe haven't acknowledged. And it's also a way of almost absolving themselves of guilt for things. So, everybody has strengths and weaknesses, and this isn't always about the weaknesses either, sometimes it's about recognizing that actually that's something that I've almost got a superpower. I'm a bit better than other people then, because of this particular combination of genes. So, you know it's positive. I think that's the main message. It's not about finding out or diagnosing disease and scary things. It's actually about tipping that whole way of thinking on its head.

Kirkland Newman (01:10:08):

And empowering people essentially, and saying these are the great things you've got, these are the challenges, but then these are the things you can do to improve your outcomes. How can people find

you? Can anybody off the street order your tests or do we have to go through practitioners? And what is the best place to find you and your company? And if we want to get this testing done.

Emma Beswick (01:10:33):

So we have a website. So our website is lifecodegx.com. And we work with practitioners and especially the mental health area, because it is quite complicated. We really, really feel that it is important to work with a practitioner. So we have a 'find a practitioner page' on there for people to connect directly with an appropriate practitioner, or we can recommend and connect you if you live in a certain part of the world, or have a particular aspect of health that you want to work with. So we also have, and there is a link on the website, but we also have a video library, which is little snapshots talking about themes, like stress, addiction, so... I'm thinking of mental health things like depression. And you can just go in and watch those and get an idea of, this is what it's about then. And we'll talk about some specific genes and most importantly, the therapeutic approach to supporting that. But that's actually quite a nice range of topics for people just to dip in and really get a better idea as to what it is we're trying to do.

Kirkland Newman (01:12:02):

In terms of compared to other people doing this, especially in the States, I know there are a few companies that do this sort of thing. Would you say that you have a USP that you do things differently in some ways, or better? Or what would be the unique thing that you guys do, that you haven't seen in other places?

Emma Beswick (01:12:22):

So not many people do genetic testing that is around the mental health space. And so that's one thing. There are a few, but they are mainly US oriented. And within those companies, the main difference is that we take a functional medicine approach, rather than a pharmacogenetics approach. So a lot of these companies are trying to assess which medicine would be best for that individual based on the way the person metabolizes the medication. Whereas, what we're looking at is more of what is the imbalance? How do we identify the reason for the way the person is feeling. And therefore, where are we going to intervene? How are we going to intervene? What part of the process would need or benefit from that support? So our way of looking at it from that perspective, is more about root cause analysis rather than fixing it from a medication perspective.

(01:13:38):

And then the final USP is the way that we present the information, which is in the pathways. And I think that gives you a richer and more intuitive perspective on the information. And I do believe that this is like all medicine, is a combination of science, and intuition, experience, and art. It's about being able to get all these different pieces of information, bring them together, and to be able to make sense of them, in the context of that person who is sitting there and who wants to feel better. And so, I think the pathway analysis really does facilitate that.

Kirkland Newman (01:14:29):

Well, that's amazing Emma. I must, say Emma Beswick from Lifecode GX. And it's just fantastic talking to you and so informative. And I have to say, I can't wait, I've done your test. I can't wait to go back and

look over the results again, and get it done for my kids. And I just think it's such valuable information. So thank you for doing what you're doing and thank you for your time today.

Emma Beswick (01:14:51):

And thank you, I have loved it!

Kirkland Newman (01:14:51):

Oh, you're so sweet. And in the show notes, we'll put all the information, your website and any other information. But yes, that was absolutely fascinating.

Emma Beswick (01:15:05):

Thank you.

Kirkland Newman (01:15:06):

Thank you so much for listening to the MindHealth360 Show. I hope that we've helped you realize that mental health symptoms have root causes that can and need to be addressed in order to sustainably heal, and have given you some ideas about steps you, your loved ones or clients may take to start their healing journey. Please share this interview with anyone you think may find it helpful, and don't forget to subscribe, to keep up to date with our latest interviews on integrative mental health. If you want further information, please go to www.mindhealth360.com or find us on social media. This information is for educational purposes only and is not intended to diagnose, or treat any disease, or to replace medical advice. Please always consult your healthcare practitioner before discontinuing any medication or implementing any changes in your diet, lifestyle or supplement program.