Functional laboratory testing for fatigue

Guest: Laura Stirling

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Claire Sehinson - [00:00:15]

Hi and welcome back to the Fatigue Super Conference, I'm Claire, the head of research at the Optimum Health Clinic, and this morning I'm so excited to be talking to a good friend of the clinic, Laura Stirling, about the different types of functional tests for fatigue clients.

So Laura herself is a registered nutritional therapist with over 12 years in practice, she's also a certified functional medicine practitioner with an IFM. And after dealing with her own illness in the early 2000s, Laura made dietary lifestyle changes to successfully restore her own health.

Laura has spent the past 12 years working for specialist diagnostic laboratories. She has a huge passion for learning and keeps up to date with lab testing developments, as well as her own understanding of biochemistry, conveys these in a practical manner to practitioners and doctors. She's a valued speaker at nutritional colleges, universities and conferences and enjoys educating practitioners. She's a founding member of A.F.M.M.P, the Applied Functional Medicine Mentoring Program, which provides unbiased and industry leading education and focuses on building a strong community of allied healthcare practitioners and to collaborate in reducing the burden of the chronic disease epidemic.

So Laura, welcome to the conference and thanks so much for joining us this morning.

Laura Stirling

Thanks so much for having me.

Claire Sehinson

You're welcome. Before we dive into a discussion about some of the tests we might use to test fatigue, perhaps you could explain to the audience what's the difference between functional testing and standard NHS testing?

Laura Stirling

The great question to start off with. So, the NHS will do markers that there's a lot of data on. That have quite broad reference ranges and that instantly pick up possibly a disease or an actual diagnosis. So let's say you're looking at thyroid, then they'll be able to diagnose this hypothyroid or hyperthyroid based on that. Let's say you're looking for diabetes or type two insulin resistance with regards to something like fatigue, they've got very specialist parameters for that.

Testing in functional medicine is slightly different. So there's two differences. Firstly, in blood testing, some of the blood tests are much more thorough, much more advanced things that have been established a little bit more recently. And so as an example they're not specific to fatigue so much, but in something like cardiovascular disease, for example, there are more advanced lipid markers, more advanced things just haven't made it into the NHS yet. They might do. It might be about cost, I

wonder often. But specifically to test fatigue using something like thyroid as an example, you can't, there's a lot of other markers that could be, the NHS will do definitely 1 marker, possibly 2. In functional medicine you would broaden that to probably 6 or 7 markers. And the reference ranges are slightly different. So there would be very broad reference ranges on the NHS that will capture absolute disease and dysfunction. With functional meds then, you narrow those reference ranges based on huge population studies as well, but to try and pick up imbalances earlier. So it's dysfunction rather than disease, if that makes sense.

Claire Sehinson - [00:03:56]

Yeah, absolutely. And I guess with something like thyroid, I think the one marker they do actually reliably use and have TSH, the thyroid stimulating hormone, but we're not really getting something like thyroxine and T4, T3 anymore.

Laura Stirling

And then there are also other tests that are just not even considered yet on the NHS. So for example, talking about adrenals for stress, they do have parameters to diagnose autoimmune or kind of failure of the adrenal glands or massive overstimulation of the adrenal glands. But there's nothing that looks at this kind of grey area looking at resiliency really for the hypothalamus, pituitary, adrenal communication that might be off. So that's just an area looking at adrenal stress that's just not even on the radar yet within the NHS, which would be more of a functional assessment I guess, the cortisol awakening response would be a good example of that.

Claire Sehinson

Yeah brilliant, so we'll go through some of those tests in a bit more detail later. Obviously, fatigue is a quite complex condition. I mean, it sounds just like somebody's tired, but when someone's tired all the time that they sort of lose that resilience. I guess, one of the things we always discuss with you at the lab is, more questions, more background on to where they're at. Are there some GP tests within normal range or within the normal functional range, as we sort of know of. But what springs to mind first, initial investigations, really obvious things to rule out, if anything, what comes to mind for you?

Laura Stirling

So firstly, I have huge respect for you guys as clinicians who specialize in fatigue because I think it is one of the hardest areas to help. With testing I ask endless questions of the client to try and work out where the biggest bang for the buck is going to be. So I think fatigue is a bit like a lasagna that's just layers and layers and layers of stuff that's going to be contributing to this person's fatigue. It's very rarely one thing in isolation.

So, I have endless questions like, what's your diet like? And depending on how that questions answered, that would be an area that I might go and explore. For female clients, are you losing a lot of blood on a monthly basis? Could that be an area that needs to be explored? Have they been carb loading for years and years and could they be pushing towards insulin resistance and diabetes? And that would be something I would explore.

So some of these things are medical, they should be assessed by the NHS first. And I think that's probably where, for you guys, most of your assessments would have been done. And if they haven't been, I think sending someone to a GP for just a blanket screen of the basic test for thyroid, anemia, just a functional, for blood chemistry, insulin possibly, and possible diabetes, looking at something like inflammatory markers as well, that's helpful. And depending on their gut health and things, could there be something like celiac that needs to be tested? Just as a kind of initial starting point medically.

Then when they've had all that done, there might be things within that that you might want to explore further. So if their TSH is a little bit higher than you might want to see optimally, but it hasn't actually been diagnosed outside of the NHS wider parameters, then you might want to do a full thyroid test. If they are frantically stressed out and haven't slept for months or sleep is a major problem.

Actually sleep is one of the big areas. I'm sure you've got people talking about sleep on this conference, but sleep is one of the huge areas I ask questions about. Quality time, are they type 1, type 2 insomniac? So that would be an area to to think about. And you might want to think about adding melatonin into a test or looking at their adrenal or cortisol, DHEA and also their neurotransmitter pars, so are they tired and wired? That would be another area.

Then, I also think about toxic burden, oxidative stress, their poor little mitochondria.

Claire Sehinson - [00:08:37]

How are they doing in all of this? I mean, with going into sleep, because that's an area that we like to kind of work with first, after digestion. With sleep, it's so key to someone recharging and breaking down their stress hormones, there's a whole cycle there with that. What are your favorite tests around something like adrenal functioning? I think the old school way of calling that sort of fatigue would be, adrenal fatigue, adrenal burnout, which some people actually really relate to, and then you get into that whole tired but wired. So they're very sort of adrenalized and wired, but they're absolutely exhausted at the same time, sort of running on nothing. So what sort of testing do you think, did you like to use for that?

Laura Stirling

So my favourite probably is the DUTCH test, which stands for Dried Urine Test for Comprehensive Hormones, might be complete hormones. I should definitely know that.

Claire Sehinson

Yeah, we'll let you off. I mean this is a great one to use, I guess, in this current pandemic where we're not having access to blood draws and phlebotomy. And it's kind of really easy to do at home, very hard to get wrong.

Laura Stirling

And it's looking at sex hormones, stress hormones and some neurotransmitter markers or organic acids, which I'll expand on in a second, if you would like me to. So, I think for male and female clients, sex hormones can really help undermine your energy and your drive. So that's a useful piece of the puzzle to look at.

Claire Sehinson

I get people who have fatigue around their cycle, just reminded me that's a question we definitely ask. Are you more tired? Are your symptoms worse? Is your fatigue worse after your or around your menstrual cycle?

Laura Stirling

And there's tons of information that you can get from those kind of questions. But also in men, low testosterone is a huge thing for the drive and oomph that can be missing and can make you feel more tired and apathetic, I think.

So, sex hormones. Then within the same test, it's looking at cortisol, cortisone and DHEA, which are your adrenal hormones. And a proper rhythm with those hormones is what really helps you get out of bed and function properly. So if that is off, it's called the cortisol awakening response. So within 30 minutes of waking, you should have your highest cortisol of the day and then that should drop off appropriately throughout the day. And if that's not really happening, if you get a kind of flat line, then it affects your va va voom and there's nothing in the tank there. So that's an important assessment.

Then alongside that they also look at your organic acids. And there's only a handful of organic acids because you can really go in depth into those and we'll probably talk about those in a second I would

think. But within the DUTCH test, they're looking at B12, which can be very important for energy and anemia, essentially. B6, which can be very helpful for things associated with energy production for sure. It gives you a bit of information about methylation, which is, I think is useful to think about for energy, but it probably wouldn't be the first place I'd go for fatigue. But it's, there's so many nutrients involved in it that I think it's really important to get the nutrients right and then methylation should catch up. But you can get really drawn into...

Claire Sehinson - [00:12:31]

Methylation itself, yeah. Dr. Kara Fitzgerald actually talking about methylation and fatigue it will be interesting because a lot of people might be thinking of tests like this. When we think of methylation we're often thinking of genetics and looking at someone's genetic snips or polymorphisms. But I find something like the DUTCH test so great because it shows the metabolomics and what the actual end products are. So yes, amazing test to actually show what's going on rather than what's the potential or what potentially could happen.

Laura Stirling

Yeah, so it gives you a possible why. If you're missing some of the nutrients that you really need for that pathway, then that's helpful. And obviously it could be things that we're not looking at like genetics.

So, B6, B12 information then also fitting in nicely with that methylation part, it looks at the breakdown products of a couple of neurotransmitters. So dopamine, adrenaline and noradrenaline are the end metabolites and you can't get to those end metabolites if you can't methylate. It's a very specific pathway that helps to clear those. So if you're looking at the result and this person is really hard wired for stress and you know that they, on questioning that they, if they nearly get hit by a car when they're crossing the road, they will feel wired and edgy and anxious all day, whereas the person next to them would have the same stress response to get them out of the road, but that just burns through and they don't feel on edge for the whole day. And that in itself, as questioning is quite useful. Are you someone who is very wired after a stressful experience? Because if you can't, if you have a surge of adrenaline, then you can't get rid of it, you can't break it down. You are going to feel more like ohh all day.

Claire Sehinson

And then you can't sleep I guess, the knock on effect. An interesting question that I ask clients is understanding that caffeine uses that same pathway to be deactivated. So often people having a cup of coffee in the morning and they're still feeling the effects of it in the evening or it effects their sleep, so some people just naturally, genetically more programmed to clear caffeine more slowly. So that's another interesting clue. I find that test just answers that question for us. It's pretty nice, isn't it?

Laura Stirling

Yeah. So sometimes you can see from the results that actually this person, well, maybe this person is not breaking this down and that's having that kind of knock on effect.

And then we will get a marker for melatonin in that test. So again, it gives you an idea, can this person make enough melatonin to sustain really good quality sleep? And often, and I don't know if it's the U.K. market or the people that we're seeing, but often there's so, so, so few people who make really, really good melatonin.

Claire Sehinson

Yeah, absolutely. Yeah.

Laura Stirling - [00:15:34]

So that's helpful. And also in the DUTCH test, not that this is a push for the DUTCH test, but you get a marker for oxidative stress looking at oxidative stress of DNA. And if that is elevated or even nearly elevated, that's a big problem. It gives you an idea that there's free radical damage going on in this person. And if you get free radicals anywhere near your mitochondria, then you're going to get some more information about why they might not be making really good energy.

Claire Sehinson

Yeah, so much information comes of this test. And I guess another marker that it has is a glutathione marker, which is primary antioxidant for immune function, for energy production, for detoxification. And when that's really challenged, it could be a sign of toxic stress as well. So, yeah, yeah the test is great for really understanding so many aspects. And we're often working off one test for months and months, which makes it really good value for our clients, this sort of test.

Laura Stirling

Yeah, I think so. And I think so, if I was the clinician thinking about fatigue, I almost think of it like, that I'm standing in the middle of a clock, so I've got to work round and see all of these different little areas that we might need to cover. And quite a big section of that clock is going to be stuff that's covered in the DUTCH test.

Claire Sehinson

And I guess going into a bit more detail around cortisol and the adrenal hormones. Obviously, one thing I think of is, looking at cortisol and melatonin together you you usually have diurnal rhythm, it literally tells your body what time of day, your brain can sort of wake up in a different country after a really long flight and just know immediately at 9am. How does your body know to do daytime things and nighttime things at certain times? So, I guess when you see something like flatline cortisol and lack of spike in the morning, that's suggesting we can't get out of bed in the morning, that becomes, that's one type of problem. Are there any other unusual abnormalities that you might see on a cortisol rhythm test?

Laura Stirling

So a lack of spike is one problem, but you could have excess cortisol. So someone who is making too much. And we're historically to blame, I think as an institution or as an area of health for pushing this adrenal fatigue, adrenal exhaustion thing, but we know that it's not that the adrenals stop working, it's not like the menopause where the ovaries decline in function. What happens is the communication from the brain. So whenever you're looking adrenal resolve, be it a saliva one, of which there are plenty of great ones as well, or they dried urine one, what you're really looking at is, what is my brain telling my adrenals to do right now?

They don't work on their own. They can't function without the signaling from up here. So, if you are hard wired for stress, which unfortunately because of trauma or some kind of adverse child events or things which again, I'm sure you're covering in this series, your brain does not perceive the world to be a safe place. And that could be physical, psychological or physiological. So your brain is telling you adrenals, this is not good, we've got to make tons of cortisol to survive. And so tons of cortisol is produced. And again, that is not a safe environment for you to fall asleep in. So if your brain is saying..., then it's not going to think, oh, great it's dark now, I can really relax and go sleep.

Claire Sehinson

Repair and digest. All of that has knock on effects on every system of the body, I guess.

Laura Stirling - [00:19:21]

Yeah. And every gene, every cell I think has a clock gene. So this rhythm is really important and how you navigate that is very difficult. So too much cortisol, it's the Goldilocks rule, right, too much cortisol is a bad thing. It can be very helpful to have times when you have lost cortisol for a period of chronic stress or if you've got an inflammatory condition, the body's desperately trying to put out the fire of that inflammation. But you want it for a short acute phase, not as a kind of chronic state. So too much as a bad thing and not enough equally is a bad thing. And they can both make you feel equally rough.

Claire Sehinson

And actually, funnily enough, I was about to ask you what sort of person looks like they have a high cortisol, but actually I think more and more in clinic we're seeing, it's quite confusing actually, the people that I thought had a flat line circadian rhythm actually turned out to have really high cortisol and cortisone so, it's quite important, I think, to really understand before you go in, particularly with biological agents or herbs and nutrients we see some people have quite adverse reactions to things that we think are quite safe, benign. And I think you can never go wrong with, things like meditation, breathing, vagus nerve work, because it will always sort of benefit in each scenario.

Laura Stirling

Oh, yeah, I definitely learned the hard way when I branched out as a newly fledgling nutritional therapist. There were two things that were actually really useful as learning points. One was, somebody came to see me with fatigue and I was obsessed with adrenals. I was like, you need to do this adrenal test this is going to cost you 80 GBP or something. This is what you do. Gave all the instructions. And I said, but you should also go to the GP and get some blood. She went to the GP and she was just flat out anemic.

And then I felt bad for saying, well I was pleased I'd told her to go to the doctor firstly, but I felt bad that I've been on this thing of like, this is the thing that's going to be causing it. So that's why I'm always like doctor first and then, let's rule out anything awful.

And then equally, I have given someone, I think I'm the only nutritionist who ever says they've done anything wrong, particularly on seminars, but I've made people feel not very well from giving them supplements that are too strong. And what is interesting about the DUTCH test, and this is kind of possibly going a little too deep, but they measure the free hormone and the metabolized hormone and in saliva, you're only getting the free hormones. This is many years ago when I was only doing saliva testing. And the free hormone can look pretty flat. And you're like, oh, God, this person has got, old school language, adrenal fatigue I need to really help them, stimulate them. And sometimes you get this pattern where that looks flat, but the metabolize cortisol, there is tons of it. So, by giving them something that's possibly slightly stimulatory, you are exacerbating that and making them feel even more stimulated.

Claire Sehinson

It's the body trying to put the brakes on the person by withholding, is that the right word? Or kind of storing the cortisol for a real life emergency, and by pushing them a bit more, you're actually, potentially pushing them into worsening of their symptoms.

Laura Stirling

Yeah, or it's not that they can't make it, it's just that they're metabolizing it incredibly quickly. And so you're, yeah, you're giving them something to make more and that's like making them more stimulated. So, yeah, I have, I'm with you, I've backed off from, I would always test, don't guess. I think the DUTCH test gives you another little piece of the puzzle that you're probably not getting from just a saliva test, but that's OK. The saliva test on its own is, I'm not against it at all. I just think you need to bear in mind that there's possibly more to this picture that you're not fully seeing.

And then, yeah, and in the interim, do things that can support you either way, whether you are up

regulated or slightly struggling.

Claire Sehinson - [00:23:52]

Yeah. Brilliant. And we touched on organic acids. And I know. One of my favorite tests is the organic acids urine tests. Again, another really convenient test to do, you can do with children. I think the only restriction is that you need to restrict water intake. So, for some people with POTS or peeing in the night constantly, it can be quite hard to collect that sample.

But I mean, going into that test a little bit, it covers so many bases, which I'm sure you'll expand on, but firstly what actually is an organic acid? The organic acid, when you're a clinician, when you do your first one, you get this thing where it's just like pages and pages of words that are completely unpronounceable. And you want to just go, ohhh.

So organic acids are very similar in structure to amino acids, but without the amine group. And they are formed by us as humans in all of our metabolic processes. So, the fact that we are able to get up in the morning and function full stop is an actual miracle. If you begin to understand all of the enzymes and little things that have to go on inside every tiny cell of our body to get us to function, I mean, it is an actual miracle. We are the most sophisticated machines ever.

We should congratulate ourselves for getting out of bed in the morning. It's the most stressful thing you can do. I like to tell my clients that.

Laura Stirling

And then we're kind of upset when we push and push and push and push and push. And then eventually everybody goes, oh, I can't do that anymore. But as part of all of these metabolic processes, we make things. And organic acids are essentially part of those metabolic processes. And there are tons of them which are measurable by incredibly sophisticated machinery from, as you said, a first morning urine sample. And what it does is it gives you, as a test, organic acid test, it gives you a little tiny window into lots and lots of areas. So, when you, as a clinician, when you look at it you're like..., but each section has a total. So it'll tell you, this bit is all from intestinal microbial overgrowth.

So that page, that particular section from yeast, fungal, bacterial waste products, essentially. So those are actually things that we don't make ourselves. Those are things that if we've got them in high levels, are most likely going to be coming from a dysbiotic picture within the microbiome. Some people say specifically to the small intestine. I personally don't put all of my way into that argument. I think it could be from any kind of microbial imbalance. So if you've got athlete's foot or vaginal thrush or some kind of topical issue, all of that plays a part.

Claire Sehinson

I've seen people, I've used it with people with, kind of, really recurrent UTIs. And we found imbalances there, too.

Laura Stirling

And, you know, if you've got a broken microbiome anywhere, it's going to have to have metabolic waste, it's got to get out of you somehow.
So, yes. So it looks in a little window into the gut. Then so cleverly, it looks at the metabolites that are made in the Krebs cycle, so from within your mitochondria, how you actually make energy, which is a very sophisticated cycle. And at each point, if that wheel can't turn, then you will get a buildup of a certain organic acids and then that gives you an idea as to why. So if the wheel can't turn, it might be that there's a nutrient missing that needs to be replaced. You add in the nutrient and then the wheel can turn. It might be that there's a toxin or something that's blocking that wheel. So then, you might need to do further testing to establish what that is. It might be that you're simply not eating enough. So we see people, for example, on keto diets where they're just, particularly women who are not eating enough carbohydrates, and their cellular function is not good enough to be able to get what

they need for for the Krebs cycle to turn.

It also looks at some neurotransmitter markers, so the same ones that we talked about in the DUTCH test, those adrenaline noradrenaline, dopamine markers and also, niacin and tryptophan markers, which gives you lots of information about why you might not be able to sleep for melatonin. Then looks at some ketone markers. So if you are on a keto diet is that what you're now fundamentally functioning on?

And then for me, the most interesting bit, I think, is these nutritional markers. So there are two ways of looking at nutritional markers. So there's, as an example there's a marker called methylmalonic acid, which is again, is also done in the DUTCH test. And it's a cellular marker, sorry it gives you an idea of the cellular need for B12. So if you've got high levels of methylmalonic acid coming up, it needs B12 as a co-factor to turn into something else. So if you haven't got enough B12, then the methylmalonic acid will go up and up and up and up and up and up until you give B12 and then it will start coming down. So you want to have normal levels, like low if anything, levels of methylmalonic acid.

Claire Sehinson - [00:29:47]

Sometimes you have actually normal B12 on a blood test, I've actually seen that too, and it's just the demand of B12 in the body is so high that that organic acid can be elevated.

Laura Stirling

Possible that they haven't got the right form in their blood or that there's other co-factors that means they can't get it into the cell. It's hard, I think that's quite common that you can have a high B12 or normal B12 in blood and yet have the cellular screaming, the cells going, I need more.

So, there's these ones where if they're high, that's a bad thing. And then there's other ones that are more of a direct measure for that nutrient. So if it's low, then that nutrient is actually low, like vitamin C or B6 or B5. They're actually being measured in urine. So if the low in urine, then you need to add that in. It gives you some ideas about detox, and indication for vitamin D, you would need to go and test vitamin D specifically.

I think in fatigue, where you've got all these possible layers of the lasagna that might be contributing towards someone, this is a nice way of looking at a few different areas of that to see where some kind of gross imbalances might be and why.

Claire Sehinson

Yeah, it's a great test. And I know you can run a short version of the, just the microbial, which a lot of people do as follow up testing. One of the markers I really like on the OAT test is oxalate, because I find, it's really interesting when you get to certain conditions like autism, there are specific patterns that we can often pick up on that. But oxalate few often, people with joint pains and, I think those compounds themselves can block Krebs cycle, so it's another useful.

Laura Stirling

Yes, they're also, sort of, sticky molecules. So they combine toxins, it can give you an idea of toxin issues. They're really compatible with yeast markers, they'll hang out like buddies. So if your yeast markers are high, then your oxalates can be as well. But depending on where they're deposited, they're like little, well in my head they're like grains of sand. So depending on where they're deposited in tissue will be a different form of pain. So you can get from the eyes or in the urine tract or in joints or things like that. So, yeah, it's another nice thing.

Sometimes some tests will make you need to go off and do other tests, further testing and sometimes you get enough information to understand from this test alone, actually these two are probably causing that.

Claire Sehinson - [00:32:45]

Yeah, yeah. I mean, there's so much information. I know a few speakers from the conference are talking about mycotoxins and molds, toxicity and I guess it's not really a because we do a whole separate mycotoxin urine test, but I think a few the markers as well on the organic acids test can indicate some sort of colonization. So one of the questions I think people that work with mold would ask, is it from external building, water damaged building, or is they're actually colonialization in my body.

So I think a few of the markers from the OAT test might be able to indicate aspergillus or a few variants, but those species. So again, usually useful and with neurotransmitters in there as well. Serotonin marker's really, really interesting, too. So, yeah, again, another really useful test.

So when something like, when everything's wrong on an OAT test, which I have seen before, as well as the opposite, everything's right and your concern is why the person's feeling so ill when metabolically they look good. And what's your priority, where do you start working? Do you go in for digestion and the microbial balance or sort of some of the raw material, the energy cellular production? And there's no sort of right answer for this. Jumping in and breaking that cycle.

Laura Stirling

It slightly depends if your gut is shot to pieces and therefore you're not getting the best out of your wonderful diet that you're now eating, that's full of color and diversity and nutrition and everything you want, then really there's no point doing anything other than trying to sort out the gut and the digestion as a starting point, because until you can get more out of your food and your supplements, then.

But it's kind of synergistic, your gut involves so much energy in its own work, that you need to get the nutrients up as well. So it's not that you would necessarily do, hold fire on all of those vitamins. I'm only going to deal with the gut. You kind of have do them slightly synergistically, I think.

And it depends how vulnerable people are. Some people, you know, they could have a terrible or bacterial dysbiotic situation, but they're not going to be well enough to deal with antimicrobials yet. So you might have to support them more nutritionally, build them up so that they are able to cope better with some of the die off that these things can release.

Claire Sehinson

Yeah, yeah, and I guess some, you know, particularly things like anemia, low ferritin, even magnesium, zinc, when we look at some of the blood tests, look at intra, extracellular, magnesium, and they're getting magnesium into the body sometimes, but they're not actually getting it into the cell. And then sometimes you just, you're not absorbing your iron. What sort of things do you start to think of when someone's supplementing and they're taking quite expensive supplements and then their blood tests or their OAT tests aren't actually getting better, what do you think of?

Laura Stirling

So I would be very suspicious about absorption dysbiosis, is something else getting to your food, your nutrients before you are, particularly with iron, you can have different bacteria that can sequester iron for their own fortification. And so I think about infection.

I would also think about something like celiac. So if the gut, again, is shots to pieces are you not able to absorb all of these wonderful things that you're eating and taking. I would think about SIBO, small intestinal bacterial overgrowth for the same reason as celiac, really. It's not damaging the infrastructure to your gut as such like celiac, but it might be preventing the absorption. I'd think about digestion, so I'm obsessed about digestion from the top down, so chewing.

Claire Sehinson - [00:36:55]

Acid and the effect that stress can have on suppressing your secretions as well.

Laura Stirling

Exactly. So hydrochloric acid, digestive enzymes. So in a stool test, for example, you can look at something like pancreatic elastase. I know there are genetic combinations that can mean that you might not be able to make as much of your pancreatic elastase as some people do.

So all of those sorts of things would be my primary things, unless there's a reason as I said, if someone's got very heavy periods and they're bleeding an awful lot, that might be why you can't get that iron up sufficiently. But otherwise, I'm always suspicious about, I'm always suspicious about why someone is anemic, full stop. Why, why, why are you anemic?

Claire Sehinson

And I guess the opposite with acute viral infection we're seeing high ferritin as well. So, it's a quite useful marker, I think just assessing where the person's at, whether they're an acute state or chronic state of fatigue.

Thinking about digestion and absorption in particular. You sort of touched on celiac and other, SIBO which can obviously, because of, just the nature of them and they're quite inflammatory that they can be gut damage or damage to the gut mucosa there. And we touched on immune system some investigations there, so much of it we think of in the gut. What sort of tests are there to look at the gut barrier? Or are there any markers in stool test that we might be able to utilize as well?

Laura Stirling

So in stool I would think about Secretory IgA, which is one of your protective markers. So, are you able to defend yourself against problems in the gut? That would be one of my first things. Short-chain fatty acids are also in a stool test which are wonderfully protective products from bacteria when you're eating good fibers, you need fiber in the diet and good bacteria to kind of get the right balance, the short-chain fatty acids. They're protective in the gut, they're protective for the brain. There's also work in them on the liver, for things like non-alcoholic fatty liver disease and adipose tissue and all sorts of things, they're wonderful.

So those sorts of things, there are ways of assessing things like intestinal permeability. You can do that with, that's not done from a stool test. But there is a marker zonulin. It's not my favourite marker in stool, but you can do that and serine.

And you can also look at other drivers or kind of immune related dysfunctions. So things in cyrex which is specific in autoimmune really, is a blood test to look at things that might be affecting barrier permeability. So like polysaccharides, antibodies to the proteins that hold your gut together, including zonulin and something called actomyosin which is essentially, the skeleton of your cells.

Claire Sehinson

I guess what we're referring to is what used to be called Leaky gut. We don't call it that anymore, but it's that hyperpermeability of the gut membrane, but I guess one of the questions clients always ask is, well, if my gut's permeable, why am I not absorbing all of my nutrients? And why aren't the vitamins just floating through nicely into the bloodstream? Why have I got nutritional deficiencies but lots of waste and garbage and kind of viral or bacterial protein floating into the bloodstream? What's your answer to that question?

Laura Stirling

Well, you need, it's a great question, actually. I've never really thought about it like that. But you need to be able to get the good out of your food and absorb it and keep the bad. It's not necessarily all

bad, but you need to keep certain things in the lumen of your gut. So if you have got a broken window and some possums have broken into your house and they're just leaving garbage all over the place and destroying everything, you were just left with a kind of trail of destruction. So it doesn't matter that the house looked nice before they broke in. So it's more about, it's a filter really I guess, this very sophisticated system that we have within our gut that is protecting us, we have lots and lots of layers before we get anywhere near the cellular breakdown. And it's so sophisticated and don't think we give it enough credit, really.

But it's essentially a super sieve, so it's allowing the good guys in, but keeping the other stuff out. And there is so much bacterial debris that's going on in our guts. We want to keep it in our guts, as soon as that becomes introduced to our immune system. So if, we have things called gram-negative bacteria, but if they are presented to the immune system, that is dangerous. So our innate immune system, our immune system that doesn't have to think, we're just born with it, is designed to protect us, violently protect us against this presentation of bacteria into our system.

So if that's going on, it's very, very pro-inflammatory. The end stage of that is sepsis, which can kill you. And I'm not saying it's anywhere near that, but even a little bit of low grade lipopolysaccharides being produced in the immune system is very inflammatory. And we know that the immune system is energetically very draining.

Claire Sehinson - [00:43:10]

Yes, absolutely. I think from one of the papers I read, it says, a chronically inflamed immune system uses 2000 kilojoules of calories a day, which is 500 to 700 calories. And the way I talk to my patients about inflammation is, imagine you were to get on to a treadmill and try and burn off 500 calories, like how long would that take? That's the amount of energy you're losing to the immune system, just chronically being low grade inflamed. So it's a huge incentive to kind of find out if that's an issue for someone.

Laura Stirling

I didn't realize it was that much.

Claire Sehinson

It's shocking once you know that you can't unknow that. And it's not like you can eat two Mars bars and get those calories back. You have to then turn it yourself, your Krebs cycle, your mitochondria, you have to turn it back into energy. So so, yes, it's really interesting.

And I guess so much, kind of leading a little bit into immune system inflammation, you mentioned the cyrex test can actually detect lipopolysaccharides, antibodies to lipopolysaccharides and we find with LPF it's a really interesting indicator of brain fog and joint inflammation and, as well as an autoimmune driver. So I guess with things like our immune function, because so much of our energy is triaged into that and we're looking at conditions like long-COVID now, we're thinking of all those, I guess people are trying to think of how to protect themselves from potentially having something like long-COVID.

So what, I know it's a bit of a complex question, that we know things like high cortisol, for example, more likely lead you into more severe, prolonged illness or just slowdown that recovery. Also inflammation, just a low or a high baseline inflammation can also lead to more severe, longer types of COVID. What sort of inflammatory markers do you like to or do you find useful to measure? I know the NHS uses CRP but we don't find that as sensitive as we'd like to. It seems to work in acute infections, but then, we're thinking of longer low grade inflammation. It's usually within range, frustratingly. From a lab point of view, what sort of?

Laura Stirling

I haven't actually looked into this specifically to long-COVID and I probably should. We do work with an extraordinary German lab called Lab4more, and I don't know if you ever read scientific papers and

you're like, wow, they can measure this stuff like, interleukin 10 and TNF alpha and all this stuff. I wonder who would do that commercially? This German lab.

Claire Sehinson - [00:46:08]

Amazing.

Laura Stirling

Yeah. So it may be that there are panels there that are worth looking at because they are going to be looking so much more in depth at the inflammatory cytokines that could be driving some of these things. I haven't looked into that properly yet, but maybe we should and see if they've got anything that they would recommend.

I think that's kind of probably the most sophisticated. I think what I've seen in the cases of long-COVID that I've talked about, I haven't seen any clinically, I'm not in clinical practice right now. I feel like it is highlighting people's vulnerability. So before they were ill, there was something that wasn't quite working right. Or that was just under the threshold. They were driving along with the engine light on, saying there's a warning, there's a warning, and they're just ignoring the engine light. And COVID has struck them at the place where possibly they're most vulnerable.

And again, the kind of layers of lasagna of fatigue, I think it could be a bit of everything, you know, tons of stress hormones, really bad blood sugar balance, not that they are diabetic, but that they have just not been working on that as a primary area, I guess.

Claire Sehinson

It's a boat load, I guess, of lots of small kind of cogs working together to either produce illness or disease.

I mean, did you find things like essential fatty, do you do essential fatty acid testing? For example, balance of...

Laura Stirling

Yeah, we do. So we have a finger prick test for essential fatty acids, which I think is a really nice starting place. So it looks at Omega 3's and Omega 6's, saturated fats and some Omega-9 fats. And you don't want to be too dominant in saturated Omega 6's, you want to have a really good balance with your Omega 3's. And generally in Western society we're too much Omega 6, over Omega 3's. So that would be an interesting area to explore.

It's always interesting in immune, autoimmune and inflammatory conditions. So, yeah, that would be a nice area to take into consideration. I wouldn't necessarily use that as a marker of inflammation as such. But I think it gives you an idea about what's potentially happening.

Claire Sehinson

Contributing to the ongoing inflammation. Yeah.

And I mean, what are your thoughts on vitamin D? Because I know a lot of practitioners, or doctors even, just prescribe it now, because we're living in England and other places, don't get any sunshine above a certain latitude. But do you, and then you have the other school of practitioners that will always test because it is a prohormone. So where do you sit on that, in terms of vitamin D? It's always nice to get it from the GP. Do you think we should be measuring it quarterly or biannually or?

Laura Stirling - [00:49:13]

I think biannually would be great, but if you're going to give anyone superphysiological doses, then test before and test to see how they're getting on. You can give very high doses and it barely shifts the needle, and that's possibly because they're just full of inflammation and it's just having a big effect on their ability to increase their vitamin D.

But you can also get people who are very sensitive and are able to absorb it and top up their levels quite quickly and you don't want to overdo it. So if you are going too, not too high, but if you're getting into the tens of thousands supplemental wise, then you need to monitor that regularly. If you're going for a more, I mean, the NHS dose is too small, I think, to worry about testing you on a regular basis.

Claire Sehinson

Yes. Yeah. It's about 1000IU.

Laura Stirling

If that sometimes. So I don't think that needs to be monitored on a particular regular basis, but if you're going out much, you know, really off label, high dose, then that really should be monitored and it's not expensive to do. We have a finger prick test that's about 40 GBP on its own. But there's also some other oils, they've also now got a little microtainer thyroid test that does CRP and Ferritin and vitamin D and B12, all of the things we've just talked about.

Claire Sehinson

Wow, that's a great starter isn't it, for someone who's just slightly concerned about fatigue and wants to open the door gently.

Laura Stirling

Yeah, yeah. And that's, I think about 80 GBP, so again, you're not, it's cost prohibitive to start, well that's all relative I know, but if you're going to be putting someone on high doses, I think you want to know where they were before you start. Then you can work out what dose to give them as is appropriate and then see if that is going up as you want it to and then back off.

Claire Sehinson

Absolutely. And I guess there's such thing as too much vitamin D which can then liberate all your minerals. So we, I mean, what sort of ranges do you like with vitamin D? I think we tend to not go over 150ng/mL, but we like it around 90 as the ideal.

Laura Stirling

Yeah. So I'd say 100 to 150 is ok, If you're getting towards 200 you're going too far.

Claire Sehinson

Too much of a good thing.

Laura Stirling

Goldilocks again.

Claire Sehinson

Yeah absolutely. And I guess the last, we're thinking load on the immune system, something that comes up, and I used to use it a lot more in clinical practice, now not so much, but food inflammation and potential, you know, we touched on celiac, which is sort of different mechanisms for food

intolerance. But, when someone is reacting to their diet or allergies to the environment, intolerance to chemicals, that can be really informative as to what to actually exclude. So it's not just about putting loads of new things in and sometimes just avoiding things that are a drain on your energy.

Laura Stirling - [00:52:20]

Well stuff like histamine, if you're, if you are creating a lot of histamine for one reason or another, that is an exhausting chemical to have loads of.

Claire Sehinson

Yeah, absolutely. And it also wakes you up in the night so it's a double whammy.

Laura Stirling

So, yes, we have a little finger prick test by an American lab called KBMO. It's called the FIT Test, Food Inflammation Test. And you can do a panel with 22 foods or you can do a much broader panel of one hundred and something foods. But it's just a finger prick looking at IgG antibodies bound to complement, which again is a pro inflammatory marker. So it's preferable to me, this test, because it's getting much more into the specifics about inflammation. And if you are having endless food reactions and obviously we need to look at the reason why that is. But as we said, that can be pretty tiring. So that would be another thing to rule out.

Claire Sehinson

Definitely a useful, I think clinical tool, because I think when people are so, some people have quite complex fatigue so it's really hard to know where to start with them. Something like that can be a huge change that they are in control of. And they can very quickly, when excluding and eating the right foods for their bodies, they can, huge improvement in short amount of time. So it's a nice win as well.

Laura Stirling

Yeah and it's nice that particular test doesn't come up with 30 or 40 things for them to cut out. The ones that I've reviewed, which I've reviewed many, but they seem to be more, more selective. So it's not too overwhelming for people to have to cut out.

Claire Sehinson

Yeah. Yeah, it's all so disheartening when 40 foods come up and you think, what can they actually eat? So yeah, that's really good to use.

I think, I mean, there is so much information that we've discussed. I think it looks like, I mean, I can imagine my clients thinking I need all of these tests. Yeah, but we can only start with one thing at a time. And often when we're running these tests, a lot of them have months of, sort of, information to work with. I think it's important to remember that, too.

Thanks, Laura. I think we'll leave it at that because we could go on and on and talk about gut and that's a whole other conversation, isn't it?

But for people who'd like to find out more, I guess, about your work with the A.F.M.M.P, and also more information about lab testing that might be suitable for them, where would you like, where could you point them to?

Laura Stirling - [00:55:01]

So, from a lab point of view, I work for Regenerus Laboratories. And so if you go to regeneruslabs.com, that's where all of our testing is, all the funky German lab tests and the DUTCH test and the organic acids, all of those, stool testing, everything is all available there.

From A.F.M.M.P point of view. If you are a practitioner, we offer a mentoring program, which is, as you said actually. Is largely based on community as well. But we do some teaching to really help take your teaching, which happens quite quickly in functional medicine, often, even if you're a doctor or a nutritionist and you've been doing all of this for years and years and years. But when you get into the kind of express train of functional medicine, there's often a bit of a gap between what happens in the classroom to what happens in clinical practice.

So we're kind of, we're specializing in where the rubber meets the road in clinical practice, so just helping people build confidence. We teach in quite a specific way. And sometimes people, I think to start with people are like, well I did all this in college, why would I need to do this again now? And it's much more practical advice than you were taught before. So, yes, we're just trying to build confidence in clinical practice.

Claire Sehinson

I think that's so important. I think new students where they learnt all the theoretical information and suddenly they're faced with a patient. And all of that theory does not match. You can do everything by the book, but sometimes it just doesn't gel with patients. So I think it's so important to have a community because it can be really isolating working on your own as a nutritional therapist and learning from a community is amazing. So, yeah, I thoroughly recommend that program.

Laura Stirling

Yeah, it's been a great project. We're really enjoying it. We get such wonderful feedback. We're very grateful for our little community that we've made.

Claire Sehinson

Thank you very much Laura for joining us today.

Laura Stirling

It's a pleasure, thank you for having me.