How your health during pregnancy shapes your baby’s brain development Transcript

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Neuroimmune Development Overview

Hey everybody, it's Dr. Laura with Connect My Brain. Okay, so we are continuing our deeper dive into the neuroimmune story. So the previous podcast, we started to explain what this means regarding neuro-immune.

In the story of a child's development, if there are open windows of development and there is some type of immune situation going on when that neurology is being developed the immune system is going to impact the outcome of that developmental window.

We highlighted one particular study that's very recent that looked at 250 children that were babies that born to mothers that tested positive for COVID.

Now the babies did not have COVID, but the immune reaction going on in mom had an impact on the development of their baby. Now that is a virus, and so what we talked about before was that this isn't only to COVID, this is any virus.

Any virus that's acute, mean it's going during your pregnancy, Or maybe your bucket from your past medical history has other things in it, like maybe Epstein-Barr, the family of herpes, which there's several of those, The idea of hand-foot-mouth, Fitt's disease, pneumonia, any of these things that we've ever had.

It can also be in the family of yeast, parasites, chronic stress, food sensitivities, irritable bowel, leaky gut, leakey brain, licky liver, any of this stuff is important for us to understand that our immune system is being taxed.

And if it's not completely cleared up, we're heading into pregnancy and creating a life with that kind of a bucket. And so this is what we're really trying to understand.

And what do we do with this information? So in the previous podcast, we talked about if you're thinking about having a baby, plan, you got to plan. You need a couple of years, you need to look at labs, You Need to Look at Your Bucket.

And these are not typically traditional lab tests. These are typically functional lab test where they're going to do a deeper dive. So I'm not talking about like just going and having a CBC, a complete blood count.

I am talking looking at like a viral bacterial load.

Planning Pregnancy and Reducing Immune Burden

If you were ever told you had Lyme, finding out where that level of Lyne is. Any of these things is important for us to look at before we go and decide that we're going to make a baby.

And it's true for mom and dad, okay? You're both coming to the equation. Now then we shifted gears and we spend more time in this arena talking about what does this mean for your child.

So if you look back at your own child's blueprint and you're saying to yourself, well, yeah, I've got some of these, The one that I left out that is really important, they're all important but one everybody kind of thinks is so common is strep.

Strep now has been completely connected to the panda's diagnosis. And we're not talking about the black and white bear, we are talking a pediatric autoimmune disorder.

That one has then connected two streps. I was talking to a mom and she said, yeah, I had lots of strep and my

child's already had streps. And people do.

They think that, well, everybody gets strept. I got to tell you, And it's important for us to realize we don't just dismiss something because it is common.

This is one of the things that I think really creates hardship on people understanding why something is going in the direction that it's going, because it is kind of thought of as, well, everybody has it.

I've had parents come in and say to me, every kid has attention deficit, I really hope not. And when we get so casual with this, we stop looking. We stop thinking that maybe there's something that we can do about it, so for the person, that wants to have a baby, I want you to think about it.

I wanna you plan your pregnancy. Look at your state of health and find out if this is the best time for you, to be conceiving a Baby. If it's not, then clean it up.

There's so many things that can be done. Clean it and then conceive your baby. It's very important. So over the course of a lifetime, we really want to pinpoint how the neurons grow and why things like immune dysfunction can have such a far-reaching effect.

And there's decades of research that shows that the environment of a child's earliest years can have effects that last a lifetime. The biological embedding of early experience in brain development is supported by numerous studies.

And today what we're really looking at It's like one and one to three to five kids. So out of every three-to-five kids, there's at least one that's having trouble going through the typical process.

of development and therefore being able to adapt to the life after birth and then go through their developmental milestones and eventually start their academic career.

So today what I want to do, because as I've mentioned in my previous one, this is going to take a little bit of unraveling. So what i'm trying to is connect the dots because i want you to understand how this can happen.

Early Brain Development and Pruning

So we started using words yesterday like apoptosis and synaptogenesis or in the previous podcast, and then we talked about pruning. So I want you to imagine a timeline.

And in your mind, in that conception period, This is what we have when the egg and sperm come together and then just begins to multiply. And then there is just this proliferation of neurons.

Then around 13, 14, 15 weeks, that is actually even the beginning of what's called apoptosis. It's kind of a scary word to me, but that word alone, just for pure definition, means cell death.

And I like to equate it more to the word pruning because what's really happening is we already have the growth of neurons. We already the migration of the neurons and the brain is already having its time.

Whatever is firing together is wiring together. and what is not part of that connection will be pruned away. This is the way our brains are very efficient.

If we just kept all of the neurons, we would not be very efficiency. Things would loop around and circuits would connect as expected. Then very shortly after that time, maybe a week or two, we start with what's called synaptogenesis, and that is literally those trees on the circuits being connected.

And I added in the links to the previous podcast a couple of pictures for you to look at. But if you wanted to just kind of look this information for yourself, if put in a search of hubs and modules of the brain, hubs, H-U-B-S, and

Modules, M-O-D-E-L-A-F, of brain.

You'll see it kind reminds me of The Spirograph that we would draw when we were kids, that you put your pen in a little hole and you twirl it around and then you see all the interconnections that are going on.

And just realizing that there's just this beautiful circuitry that goes on up in our brain. The other part about it is we all have the same stuff, but things might wire together a little different between us because of our experience.

Now, going into about the 28th week, that's when myelination is occurring, and myelination is going to continue well into the mid-20s. And I would tell you that even when you're working on with neuroplasticity, these types of growth and changes are still able to continue.

So don't think it's a stop sign at 25. But then, and what myelin is, it's this white coating that goes over every nerve. It is all of the white matter of And what that means is it's like the tracks.

So myelin creates the conduction, the speed in which information is going to travel down axons and cross over different synaptic junctions. Myelin is very, very important.

And depending upon who you want to quote, There's many authors that believe that the vestibular system is actually the first to come on, completely mature and myelinated by the time we are born.

And from the work that I do, I really, go from that premise because I think the Vestibula system, is a very powerful system. I mean, by this podcast that you'll understand too, it's all about the movement.

The vestibular system is a very small little structure inside of your ears and there's three little canals and inside those canales are these otoliths and crystals and little hair follicles.

And every time you move, the endolymph or the fluid inside those canals moves. And when it moves, it's moving the crystals, its moving, the little hair follicles, and it literally is telling your brain where you're going.

Now, there's also deeper reflection into the vestibular system that it's not just limited to the traditional idea of moving, like a child crawling, a children coming out of the birth canal.

But inside of human body, we have a very particular way that everything moves in our body. Our blood travels a certain way, and if it doesn't, There's something wrong and it could be a pathology.

There is a very particular way that the egg and sperm come together and if it doesn't, we may have a hard time conceiving a baby. So movement is both external and internal.

And then we've got the concept of emotions. When we feel really positive and confident about ourself, our posture is upright and we can feel confident.

But when we're sad or we are depressed, we might be more slumped over and inflection. That too is a movement. So the vestibular system is very far-reaching.

Now, when we get into after birth, this is where we start to look at how that sensory system is going to come on board. And as that sensor system, sensory motor, comes on-board, starting with your milestones, getting that child really engaged in their environment, they're not avoiding anything, then that also is creating greater connection to the different lobes of the brain and eventually all the way up to, the prefrontal cortex and the temporal cortex are the ones on the side.

Now, when we also get to about four-ish is when, we start going through more pruning. Meaning, now you're here, you've gone through the reflex stage, and now, gone you through birth, engaged in sensory motor, it's time to keep cleaning up the circuits and how many neurons are actually there, what kind of communication flow do you have?

So we know that this is, how important this, is one of the things that we do is we want to look at how well that process is going. And that does not stop up until the 20s, mid-20s.

Now it slows down, the greatest time of pruning is actually in those earlier years. That's why babies have really big heads. You don't get to keep all those neurons.

So as the body goes through that, as brain cleaves off excess that's not being used, then we have a more efficient brain. This is one of the biggest things that is found in the diagnosis of autism is that they lack pruning.

And I can also see it in many different things when somebody is not following that traditional path of cognitive development, movement development etc.

and I really should say movement first. Everything is about movement FIRST.

Vestibular System and Sensory-Motor Growth

So we always wanna make sure that when we're looking at a child, that we are really paying attention to how the brain is functioning and how their development is going.

And one of the biggest issues that is now being connected Two, I am going to call it an epidemic of children that are not developing as expected. And there's many, many reasons for it and there are many different timelines for.

But one of the things that did come out of a lot of research that's been recently done during the situation with the pandemic and how much stress and fear was going on that when a mother has very high levels of stress, there is a connection of motor delay, cognitive delay and language development in these young children.

Now, back in the 80s when autism, like really the diagnoses of autism really took off, we have to realize that over these decades, this research has been looked at.

And I believe that they're really fine tuning. It's just that sometimes things just take so long for someone to publish and more importantly, for our traditional healthcare approach or medical model to accept.

And I can remember reading maybe back in early 2000s that one of the things that they found to be most common in the mothers that these children were later diagnosed autistic was stress.

And the number one stressor was suffering a loss. We understand a lost when you lose somebody, but there can also be a lose of maybe a career or maybe you're a single mother and you are doing this by yourself.

And these things are very stressful. And, you know, as time has gone on and in this last season of time that our country, the world, has been in, There's been so much information that has come out that that stressful response has had a huge impact.

We'll think about for a minute what happens when we are in a stress response. and we've talked about this in previous podcasts so I'll kind of you know zip it up pretty quickly but it's a physiological event and I think there's lots of people that just simply go around and say I am so stressed out first of all I want to really caution you to watch what you speak over yourself You know, your brain listens to you.

And like when we're doing neurofeedback, neuro feedback uses two reward systems, the visual system and the auditory system. And that means that your mind and primarily your subconscious mind is literally looking for the pattern so that the picture will go bright.

It's very common in neurofeedback that there'll be a visual filter that will over the screen that when you're meeting the reward, then the pictures will be bright, But when you are not meeting the reward, the picture is dark.

So this is from your visual system. And then there's a sound that is associated with the pictures going bright. Right

there, we know that there is a connection between the outside world and how we think and how our brain functions.

And it's really important for us to speak the right words over ourselves. So I would caution you, don't go around saying that you're stressed out all the time, because it is going to potentially cause problems.

It's not always about having a baby, but again, that chronicity of our thought life over time your brain begins to think this is who you are and this where you want to be and therefore It's going to surrender real estate from your brain, good connections that you may have had back from when you were a kid, but you're not using them anymore.

And your brains goes, wow, you just want to keep going with this stress response. So what I'm going do is I am going take that real state and I going apply it to the stress responses just so we can keep it going.

And this has very far reaching effects. And again, this too impacts children. I have seen kids that the first time I meet them, they'll tell me how they hate school.

Or when we're doing the assessment, Their responses are always like, oh, did I do that wrong? Oh, is my number bad? And wow, we start so young beating kids down.

And then if nobody comes in and shifts that direction, if somebody tells them to do it differently, they grow up thinking this way. And we got to change it because the area in those temporal cortices, the ones on the side, that's where the hippocampus is.

And the Hippocampsus, is your long-term memory, it's having cognitive flexibility, and that is really important. Let me finish that thought. And then I want to tie that back to impulsivity.

That's how we got to realize how these circuits actually work. So when we have a hard time with keeping stress going, there's also the chemical bath that goes with it.

I think of the hippocampus as having all these lightning rods on it, and the stress chemicals go and bathe over those receptors, and it blocks new learning and long-term memory.

And the other thing that your hippocampus does is it creates your personality. And so when we block this with stress chemicals, it would be very difficult for a child to learn.

It would very be difficult to want to engage in anything new. And they just don't go towards, and this could be the kid that you also want say, they have no motivation.

Stress, Hippocampus, and Learning

Well, I'm not saying definitively that that's the only reason, but I can tell you about nine times out of 10, it is the reason. People are walking around in a lot of stress.

And in that season of time, we didn't have a point of reference and our children didn' have point to reference during COVID, which then literally put us all into a heightened state of stressed.

Now if I don't have cognitive flexibility, if i don' have motivation, those other characteristics that we were talking about with the hippocampus, this can also create this idea of that impulsive reaction because I don't have the flexibility to take in the information that gives me the sequence of events that I should do.

So as a child, as I learn to try to adapt, I am just going to take those little pieces of information and I'm going jump at it because in some cases the child just wants to be helpful.

I saw that the other day. Everybody's already saying about this one little child that there's great impulsivity. I just saw a child that wanted to help and had a hard time being able to take the direction, let the sequence happen, or allow me to, take us through the steps.

So then he would know it. And one of the things that we do here at Connect My Brain is we teach these kids how to set themselves up on all the different equipment.

We're trying to inspire motivation, we're trying to create the skill of learning how to take initiative and how look at a situation and know, am I following the sequence of steps.

And rather than telling them that they're wrong, we're telling, okay, hold on a second. Let's go back through that. Did we follow all of the steps? Oh, there's the one.

Okay, so let's add that one in and I'm sure then that you're on your way. You know, it's important when a child is demonstrating that, they don't know how to do something.

that we really take the time and find out if they know how to do it. So here's an example of that. I was noticing with another little person that every time we were doing what we call our neurosensory integrator board and we we're doing eye movements called saccades, which are quick movements, scanning the screen for letters and numbers, the child was always flipping the numbers.

and letters. And so we started talking about it and realized that it isn't, when the child tries to do the alphabet verbally, has that sequence because children are taught the mnemonic of a alphabet song, okay?

And one of the things that I find really funny is listening to them going, L-M-N-O-P, for L, M, N, O, P. And we really do start trying to break that habit.

And I really encourage you, even when your child is learning, right at the beginning, stop them and say, let's slow down and let say L M N O P. Lots of times when we are practicing sequencing activities, that's what the children lose is the middle between the begin of the alphabet and the end of alphabet.

And yes, it's L, M, N, O, P, so I would encourage you slow them down And yes, it can be cute, but if it's continued to be practiced, always remember, whatever we are practicing, that is what we're firing together and wiring together, and at some point it is going to have to broken.

So we started talking to the parent and helping them understand. We got to put a little emphasis on this and really make sure that they know what they're seeing, okay?

So when we talk about what you're saying, it's not just visual acuity, the clarity, but it is the motor part. And that visual cortex is all the way back here in the back of the brain.

and literally your retina goes all the way to the front outside of your skull in your eyeball. So we got to make sure kids really know how to see and then you got a build the visual imagery in you mind and when a child has any kind of motor issue it affects how that brain is ultimately going to be wired up, especially when we're trying to connect both sides of the brain.

So we are doing flashcards, that's terrific. And we were practicing coloring and that is terrific, and we working on handwriting, That's Terrific. But if they cannot see the letter in their mind as they are writing it, they won't have great penmanship.

That too is another part about bringing both sides of the brain together. When babies start out, I'm holding up my hand for my podcast audience, And on the side where the pinky is, so the ring finger, the middle finger and the pinkie, children navigate the world as a rake.

And then it isn't till around four that we create the pincer grip. So if I don't go through the developmental sequence, if i don t integrate a palmar reflex, it is going to be very difficult for me to write.

If I did not lateralize correctly, meaning is my eye, ear, hand, and foot all on one side? Are things crossed over? It's going to be very difficult to use both sides of the brain.

So again, all these little things, handwriting, being able to organize your mechanics of your body, your eye, ear, hand, and foot, these are all motor.

And of course they have a sensory connection.

Motor Skills, Milestones, and Parent Resources

That's why they're saying everything is pointing to if that child's motor skills are not where they are supposed to be, that is already sending up a red flag, potential developmental delay.

And we can see motor in the womb. Did you feel the baby kicking? Did feel you the the moving? I have actually met people that told me two in one little season of time, yeah, my baby never moved.

And one of the kids was always banging his head. And by the time I met him, he had had seven mild concussions, like standing up and hitting his had on the locker door above.

You have to ask yourself, Is there a possibility that that motor did not get laid down correctly? And that's why when we do a developmental assessment, we are spending a lot of time on looking at that Motor system, the mechanical.

So I always talk about mechanical chemical brain. We want to make sure that these children are able to do the things that they should be doing at that certain age.

And don't forget, Connect My Brain put together a great app. Everything about us is called Connect my Brain. And you can get this on either Apple or Google and Google Play, I think is what it is.

The links are right there on the website. But this is going to put into your hands. You can look up what your child should be doing and the earlier that we get to it, the better.

We have to be able to change the trajectory of development as soon as possible. Every time these kids get older, it gets a little bit harder. Now it doesn't mean it can't be done, so I don't want anybody to think that if your child is eight or nine that you can do things.

You can, but I'm going to have to ask you to be ready to roll up your sleeves so that we can get the work done. And this has everything to do with the different developmental windows.

between seven and a half and eight and half that's when that brain is going okay i'm surging up to the top and so of course getting to it before that that year seven-and-a-half to eight- and- a- half is very valuable and it makes it just a little bit easier to make change so this is what we're trying to educate Let's look at these children.

If you're ever asking yourself, is my child on target? Look at the app. And you can also go over to the website and on the podcast page, you Can download Dr.

Hansen's guide to developmental milestones and have a hard copy, no charge. You can always send me a message through the website. The most important thing is to ask.

Don't wonder. If we keep wondering and time goes on before you know it, these kids are further down the road. Not only is it harder, but it's their childhood that's truly being impacted.

Now we are also really, we're launching more remote services for our families and our community, the world. So check out on the website, CMB Store, and there's the Jumpstart program.

We've talked about that, as well as the new parent membership. And what the parent membership is all about is giving you a deeper dive through a private podcast.

I will take a topic and I'll pull it apart and even give you some recommendations. And then there's going to be

different tools to help you feel more supported as you parent your child.

And then watching the podcast, you're listening to the podcasts, how about giving me a review? It's so important to get this information out there. We've got lots of kids that really need support and you can help.

If you write a revue, it plugs something into an algorithm. I'm not quite sure what that is. I leave that up to the wonderful support team that I have, Marcy Page, Stephanie Meyer, and Natasha.

They help me, they navigate me. they help know how we can get more information into the hands of our parents. We've also launched an account on Hero, H-I-R-O-F-M.

And we are moving to a more auditory platform because we realize most people are listening to things today and we're gonna try to meet you exactly where those needs are.

So be sure and take the time to send your questions through the website connectmybrain.com, leave a review, follow us on Instagram, check out our parent membership and our Jumpstart program.

Now we're not done with the neuroimmune. In fact, what we are going to do next time is we going talk about the maternal immune activation. and what this is is when mama's system is in an inflammatory response and lots of things can cause this but some of the big ones are psychological and social stress, any kind of psychological disorder, overweight, autoimmune conditions, asthma and allergy conditions like we talked about when there's a flare in that second trimester, and then of course, any of these viral bacterial infections.

These are culprits that are already being connected to neurodevelopmental delay. The brain is developing, That's our neurology. The immune system is under attack and that attack is impacting the direction of your child's development.

Please share this information. It's so important that we all begin to understand health is in our hands. We need to take control of our bodies and be able to look at our health make decisions and by all means change the things that need to be changed.

Thanks for tuning in and I hope you have a wonderful day and as always be blessed.