Introduction to Nitric Oxide and Fertility

Hey. Hey, welcome to the Beyond Infertility Summit. And I'm going to introduce my next guest, Dr. Nathan Bryan, who is one of the most incredible doctors.

He has been in practice for a very long time, and he has spent over 20 years researching what we're going to talk about today. So he has been in clinical medicine as well as research medicine.

He really brings a knowledgeable center to what is important to know related to nitric oxide and fertility. What I'm really excited about is he's going to blow your mind on some of the things that we're doing every single day that is negatively affecting the nitric oxide production and hence fertility.

And you'll also hear something that is going to blow your mind about men and sperm health related to nitric oxide. So you want to listen to the entire episode.

I am very excited to have him because he is honestly like one of the best teachers that I have found. I've heard him at several lectures. I think he's awesome.

So let me know what you guys think. Put it in the comments. Are you guys excited about this? And let's get into it. Thank you so much for joining us today. Dr. Bryan.

I am very excited to dove into what I think is one of the key nutrients missing pieces of the fertility puzzle. So let's start with the basics. What is Nitric Oxide?

Well, thank you very much. It's an honor and a pleasure to be with you and really address this very interesting topic. And I think, as you said, it's kind of the missing the missing link.

And what we know about really all aspects of medicine, including fertility, the Nitric Oxide is a signaling molecule. It's a gas that's naturally produced in the human body.

And then once it's produced, it's grown in less than a second. But when it's produced, it activates a number of different signaling cascades. So it's really how cells in the body communicate with one another.

And it's involved in the regulation of circulation and blood flow and oxygen delivery. It's a neurotransmitter in the simple nervous system, and it's really part of our immune system and how our immune system fights off invading pathogens from bacteria and viruses and now we're learning we'll learn them for more than 20 years that Nitric Oxide is critically important in sexual medicine, reproductive medicine, fertility.

What Nitric Oxide Does in the Body

And so when you lose the ability to make nitric oxide, then a lot of things begin to happen that aren't really conducive with normal physiology. So we have to be able to, number one, understand how the human body makes nitric oxide, what goes wrong in people that can't make it in them?

How do we fix this? And once you fix this, then people get better and every organ system in the body works in. Mm hmm. So it sounds like it's a pretty crucial piece of so many for fertility and other health issues.

How I feel like there was, at least from my medical education 17 years ago, I remember that nitric oxide was critical to blood circulation. Right, right.

Folds, all of that kind of stuff. Can you remind me like what else is nitric oxide doing in the body? Like, why is that

so crucial to every piece of health?

We know 17 years ago we've come a long way and 17 years. You know, the the advancement of science happens so quickly now. But, you know, when you were taught and I taught in medical schools for ten or 12 years when I was an assistant professor of medicine at the University of Texas Medical School, but it was first rather recognizes that they are dilated.

In fact, the Nobel Prize in Medicine was awarded in 1998 for its role in the cardiovascular system as modulating vasodilation, improving blood flow, regulating blood pressure, things like that.

And that's still kind of a primary role of nitric oxide in the cardiovascular system. But, you know, 17 years ago we thought that, you know, it's made in the lining of the blood vessels.

It's only made in neurons and it's activated by our immune system. But now we know that there's nitric oxide being produced in every cell type, including sperm, including, you know, eggs and responsible for not just ovulation, but sperm motility.

It's responsible for erections in both men and women, which is kind of the first step in fertility and getting your pet, your patients pregnant. We got we got to have normal function, right, for that to happen.

Yeah, absolutely. So what are like what are the chief roles as far as fertility and sexual health go in terms of what nitric oxide does? Well, let's. Start with kind of the first step in the process.

So as I mentioned, it's the molecule that's responsible for erections in both women, men and women. So as you know, drugs like Viagra, Cialis, and Levitra, phosphodiesterase inhibitors been very successful over the past 25 years on the market and they basically elicit vasodilation.

So you get engorgement in the penis in the clitoris and that's what responsible for erections. But these drugs are dependent upon nitric oxide production and 50% of the men that are prescribed these drugs don't respond with better erections because their body is not making enough microbes oxide to activate the signaling.

PESCI So that's number one. If you if you have erectile dysfunction or sexual dysfunction in both men and women, then that's a sign and symptom of nitric oxide deficiency.

So obviously, if you can't penetrate it, you can't have an orgasm, then there's no chance of conception. Let's talk about it. So once we get that addressed, then what happens then, right?

If we have insemination and the egg meets the sperm, then if the sperm actually make their own nitric oxide, it's what regulates sperm up to the patients who have decreased nitric oxide production typically have decreased sperm motility.

So the we don't get optimal fertilization. It's also involved in ovulation. We know the monthly cycles of the population in women. So everything we know about no conception and then growth of the know the early embryo into a fetus into a live baby is dependent upon nitric oxide getting sufficient blood supply.

They're mobilizing stem cells, fully oxygenating the new embryo. And all of that is dependent on nitric oxide production. Wow. Wow. Yes. So we really do need this.

How do we figure out if we're deficient?

Nitric Oxideu2019s Role in Fertility and Sexual Health

You know, years ago, you know, that's been a major problem for the past 20 years is how do you determine if your nitric oxide deficient? And unfortunately in in regular medicine you know you can draw blood and run labs and figure out what your but for instance, your cholesterol or vitamin B or magnesium, if you look for nitric oxide, that's

not the case because it's a gas.

It's produced in a stone in less than a second. So it's not anything we can detect in blood and do labs for in about 15 years ago I developed to celebrate test strip now and it's I tell people it's a good tool to have in your toolbox but it's not the end all be all cure all it's not you know it's a biochemical test.

So the beauty of that test is there's really no false negatives. So when we sample our saliva and we're low by the test strip and it tells us that we're proficient in nitric oxide, what it doesn't tell us is why we're deficient.

Now, there are some false positives that you can have because if you have an active oral infection, you'll have a false positive reading. So it's an active immune response, any oral cavity and really not reflective of systemic nitric oxide production.

So for that reason, I've gotten away from each of the test strips just because it's the too many false positives. Give people a false sense of security.

So what do we do? We have to rely on symptoms. So if your patients have an elevation in blood pressure, then that's a sign and symptom of nitric oxide deficiency.

If they have some degree of erectile dysfunction, obviously that's a sign of nitric oxide deficiency, insulin resistance. You know, we published in 2009 that nitric oxide is part of the insulin signaling pathway.

Without nitric oxide, you get insulin resistance and you don't get glucose uptake in the circulation, you know, fatigue, inability to exercise. If you get short of breath when you walk two steps, then that's the sign of nitric oxide deficiency vascular dementia, mild cognitive disorders.

You can't regulate blood flow to the brain. You develop memory problems and cognition and dementia and if not corrected also. So those are kind of we have to look at the clinical, the whole picture of the patient.

And my objective in all this and I think obviously the objective is to start to consider nitric oxide deficiency as part of the clinical problem and the picture of the patient and then take steps to restore nitric oxide production.

What we found over the past 20 years is that everything else you do from then on works better. Yeah, I believe. I feel like just noticing that so many people are either deficient or have symptoms of deficiency and supporting their nitric oxide levels in the body really helps fertility in so many ways.

Right? Well, I mean, I'm sure your in your in your clinical practice fertility is probably not their only health issue. In fact, it's a consequence of other issues.

Right. So no healthy person comes to a fertility clinic, typically with the inability to conceive. They've got some underlying issues or problems that maybe have been misdiagnosed or not even diagnosed previously.

So this is a consequence of an underlying disorder and you have to get to the root problem. And many times we finding that nitric oxide part of the solution.

Yes. Thank you so much for saying that because I feel like I'm the weirdo out there. So yeah, I, I completely agree. And there are so many underlying scenarios that lead to fertility struggles, but fertility that's partly like the misnomer is infertility is a diagnosis.

So it doesn't really mean anything if you don't have it happening under the surface. Well, we're the where the weirdos because we think different and it's the people who think differently that make a difference.

I think even for that. Cool. So I, we talked a little bit about what it is, what nitric oxide is, what it does in the body, how it does or doesn't support fertility, what some of the signs and symptoms are, what are some ways to improve our nitric oxide production?

How to Tell If Youu2019re Nitric Oxide Deficient

You know, it's a very good question. And so, you know, it's probably one of the most common questions I receive. And so I tell people it's very simple.

You only have to do two things. Stop doing the things that disrupt nitric oxide production, and then start doing the things that promote. No, let's let's take those one by one.

So what's disrupting nitric oxide production in this? This is kind of the jaw dropping moment for many, many physicians is you have to start asking your patients if they're using mouthwash because mouthwash kills and destroys the oral microbiome, which are absolutely essential and producing nitric oxide.

And so we and others have published we published our first paper, I believe, in 2011, showing that when you use mouthwash, it kills the oral microbiome and your blood pressure goes up.

You know, two out of three Americans use mouthwash every day and two out of three Americans have an unsafe elevation of blood pressure. That's not coincidental.

We and others have proved that it's causal. So if you're using mouthwash, when you have fertility issues, you have them to go with the simple solution to just stop, right?

I mean, that's a cost saving measure. Yeah. The other problem is fluoride people we use for native toothpaste, chlorides and antiseptic. It's a neurotoxin and it destroys your thyroid function and as you know, people have hyperthyroidism typically have fertility issues.

So fluoride is a is a, you know, it competes with iodine binding to the thyroid hormone. And, you know, it's like I said, it's an anesthetic. So get rid of fluoride in your toothpaste, don't use fluoridated mouth rinses and then you have to get rid of fluoride in the municipal water.

Now fluoride is added to municipal water systems because it's antiseptic, antibacterial and keeps the water supply safe. But it's providing a neurotoxin to the human body.

So it's not just the fluoride that you're drinking, you're bathing in it, you're cooking in it. And so I encourage people to get a home filtration system to remove not just fluoride, but all the other toxins and drug metabolites that are found in municipal water.

Those are the big two. Then the other thing, or in essence, you know, protons, inhibitors specifically completely shut down nitric oxide production. And in 2015, there was a published study, a large scale study showing that people who have been on PPIs, these are proton pump inhibitors, things like omeprazole, all people have been on these drugs for 3 to 5 years, had a 35% increase in heart attacks and strokes.

And now just what, two weeks ago, there was another report came out that people have been on these drugs for three years, had a 40% increase in dementia.

So these drugs are not only dangerous, they're deadly. And so we need stomach acid to make nitric oxide. We need stomach acid to absorb iodine and B vitamins, zinc, selenium, iron.

And without stomach acid, we can't do any of this. So we have to get people off an acid. So those are the big three. Stop using mouthwash, get rid of fluoride.

If you don't in acid, you have to get off. Now your body's primed to make nitric oxide and actually absorb nutrients so cells can do their job. And then what do we do to promote it?

Well, it's very simple diet and lifestyle, a balanced diet in moderation, throwing in some more green, leafy vegetables, 20, 30 minutes of exercise per day is shown to clinically upregulate nitric oxide production and then 20

to 30 minutes of sunlight.

You know, there's certain wavelengths of light that can stimulate or promote nitric oxide release and production. So those are the basics. And I think those are the questions that most physicians fail to ask when they've got a chronically ill patient.

And those we've proven in others that these are contributing to the underlying symptoms and prior and progression of disease that's been poorly managed by most so-called specialists or physicians.

What Disrupts Nitric Oxide Production

Yeah. Yeah, absolutely. And I think I think I've heard you say the mouthwash and fluoride thing before and I still haven't put it into our intake form.

So that's changing today. Now we do find that at oral dysbiosis or like imbalance of the microflora in the oral cavity also affects the vaginal microflora.

So there are some studies coming out about that connection. So it has my brain going like, Huh, I wonder what else we're doing that's affecting the downstream impact on fertility, but it's starting in our mouth.

Yeah. You know, the microbiome is extremely important. You know, 20, 25 years we've understood the importance of the gut microbiome contributing to not just overall immunity, but the onset of systemic disease.

And, you know, there's a reason we don't take an antibiotic every day for the rest of our lives. You put on a very short regimen, a 7 to 10 day regimen, antibiotics, and then you first stop, right, because of the disruption and the collateral damage it's causing to the good bacteria, the living in on our body.

Same thing happens when we use an antiseptic mouthwash every day for the rest of our life. We're killing the bacteria. So it's a dysbiosis. And then this causes dysbiosis throughout other organ systems.

So we have to maintain a healthy microbiome, whether it's in the mouth, the gut or even in the, you know, the vaginal. Yeah, yeah, absolutely. Are there specific foods that you love for improving nitric oxide production?

Yeah, foods have been shown to to contribute to nitric oxide production. But again, the diet and really exercise is all dependent upon the oral microbiome and the diet and the ability to produce stomach acid.

So you can exercise, you can eat all the right foods. But if you're using mouthwash in an acid, you're not going to get any nitric oxide benefit from diet or exercise.

So that's first. But let's just assume that you have the right oral microbiome. You have sufficient stomach acid production. Now what we've published on is that green leafy vegetables typically have the highest amount of a molecule called nitrate you don't get.

And then when we consume these green leafy vegetables, it's absorbed in the gut. 90 minutes after we consume them, it's concentrated in our salivary glands.

And then when we salivate, now these bacteria that live in the mouth metabolize nitrate into nitrite and nitric oxide in them, and we swallow our own saliva.

We get a burst of the nitric oxide gas in the stomach. So these are things like spinach, kale, arugula, beets have been a hero vegetable for the past ten or 12 years.

But really the variability of the nitrate in these foods is so variable that we really can't make recommendations on how much you would need to eat of what vegetable.

There's differences in farming practices, social conditions. All these variables determine and dictate what the nutrient density of the food is. So if we if you look kind of on average, the dark green leafy vegetables are typically the best.

Okay, let me think what you just said brought up a question for me in old Indian medicine. It's called Veda. There's this idea of don't brush your teeth right after you eat.

And what you just said is like 90 minutes after you consume these vegetables is really when that like nitrate. Nitrate to nitrate. Is it the nitrate tonight?

Nitrate treated nitrate is happening in the oral cavity. You know, there's geographical differences. So if you brushed after you eat, are you like wiping out that possible reaction?

Well, if you're using an antiseptic fluorinated toothpaste, yes. If you're using a mouth. Right. Like majority of people use fluoride in their toothpaste, it's kind of what the dentist told us to do.

Well, you know, the Philistines used to use leeches to exterminate us, too. And we don't do that anymore because we know better. Now, I think the dentists need to understand that, too, and that's the most common answer I get from dentists.

When I ask these questions, they go, Well, that's what we've always done. Well, that's not a battle excuse. Now the advancement of science and medicine occurs so rapidly in doing things we did even ten years ago.

Isn't that anymore? In medicine, there's advancements and we have to integrate these into clinical practice. Yeah. And the risk benefit of mouthwash is so weighted in the risk category now that I don't know why anybody in the world would use a mouthwash or fluoridated toothpaste at all. Hmm.

Wow. Wow. That's blowing my mind. That usually gets people's attention. So, you know, things like traditional Chinese medicine, all your Vedic medicine, these these health practices and medical practices have stood the test of time, right?

Foods, Lifestyle, and Oral Health for Nitric Oxide

They stood the test of time because they're effective and they work. So these old principles, you know, Western medicine is enforced. Fortunately, got away from these basic principles that have been practiced for thousands of years, long before Western medicine evolved.

So there's whole concept of not brushing your teeth after a meal. Obviously, they didn't know anything about nitric oxide and nitrate reducing bacteria in the oral microbiome back then.

But obviously they made some astute observation that made them that allowed them to make that recommendation. Today we know mechanistically why that is because 90 minutes after you consume the meal, if you don't have the right oral bacteria, you're not going to get any nitric oxide benefits from eating that meal. Hmm.

Wow. Amazing. I like you just read that. But it's like. I grew up with it, you know, like my my father was a believer, and I really like medicine, and I grew up in it.

I studied it in India, but like, just hearing these things never made sense until the science connects for me. And then I'm like, Oh, does that totally make sense?

Because if you told us 5000 years ago, we just aren't doing it in real life. So. Well, this is I mean, I think this is the the basis of how, you know, I've been in basic science research for 20 years and, you know, most basic science research tries to fit a square peg in a round hole and it never fits.

So what I like to do is take some really astute observations, write clinical observations, things that are clinically

meaningful, and then work backwards and try to explain it.

And then once you understand mechanistically how that observation, we can explain that observation. Now, you better understand it. And you can devise strategies or medicines based on an observation, not based on a hope of an observation.

And you know that in fact, that's how the nitric oxide was actually discovered. Drugs like nitroglycerin, which were used for 150 years prior to the 1980s, physicians used them because they were they didn't have any idea how they work.

And then it was worked by Fred Murat, who won the Nobel Prize that discovered, well, these drugs work because they release nitric oxide, they leave the coronary artery, nasal dilation and the acute symptomatic of into the ischemia pain as an agent.

So just because we didn't understand how it works didn't mean that the physicians didn't use it. But now once we figured out how to use it, now we have technology better than nitroglycerin.

But you don't develop tolerance that has better side of protective effects and that's leading to better management of patients. So that's how it should work, but it's all based on important observations.

Going back to the diabetic observations, going back to traditional Chinese medicine five, 6000 years ago. And now we can explain it to the. Yeah, yeah.

Amazing. What is there any value or is there space for supplementation? And I know that a lot of times people want to jump to the supplements, like what is the thing that I can take so that you started with a foundation of like, here's the stuff not to do, here's the stuff to do, but is there a benefit or a specific need when supplementation would be appropriate?

Well, I. Think generally today, because of the food that's grown here in America and because of our battery patterns that we almost have to supplement.

But it's not to say that you supplement everything. Right. And I think that's where personalized nutrition comes in. We have to do personalized testing, macronutrient analysis, figure out what that individual patient is missing, and then supplement it.

Yeah, right. The nutrient density of the food grown in the US from 1940 to 2010, there was a 78% reduction in nutrient density of the vegetables grown in the US.

So we're deficient in things like magnesium, selenium, chromium, iron iodide and these things have to be supplemented sometimes and it's the same thing with nitric oxide.

So if your nitric oxide deficient and 99% of the supplements on the market that are so called nitric oxide supplements don't do anything for nitric oxide.

And that's the frustration with me has been in the science for 25 years is companies out there deliberately deceiving their customers, trying to get them to buy products that they know there's no way they can make nitric oxide.

And so what we did is come to market with a product that actually generates nitric oxide. So if your body can't make it and our product to do it for you, but more importantly, we fix the reason your body can't make nitric oxide, right?

We re coupled the mast enzyme in the lining of the blood vessel. We restore the oral microbiome. Now we're giving your body what it needs to make oxide on its own.

And that's the goal.

Supplementation and Restoring Physiology

You know, we we try to practice this concept of restorative physiology. You know, the practice of medicine was supposed to be based on the principles of applied physiology, right?

Understand disease to the extent that we can correct it. And that's basically what we're trying to do. We understand how the body makes nitric oxide. We know what goes wrong if people can't make it and now we can fix it.

And we do this through supplements. We get the nutrition, and we also do it through some of the drugs that we're taking through clinical trials. So we have approved on the market in the next year.

Wow. Well, yeah, that's awesome. I like I like the idea of restorative physiology. Our process is called restorative fertility, so. I love it. It's the same.

It's like how do we restore function? Because it's not like we don't have something that we need. It's more that what we need is hidden or taken over by things that are not working really well in our bodies.

So, yeah. So I think that's the only principle that people actually get better. And I think it goes a little bit more than that, you know, goes back to the days of Linus Pauling, who said that most chronic diseases are caused by nutrient deficiencies.

So we have to repeat this, but I think it goes a step beyond that. We're also so my perspective is that chronic disease, whether it's infertility or cardiovascular disease or Alzheimer's, there's two reasons and two reasons.

Only your body's missing something that it needs or exposed to something it does. So now we have to consider toxins, right? What's in the body that's preventing the body from doing its job?

So even if we replete all the missing nutrients, if there's a toxin involved, whether it's a latent virus, whether it's a bacterial infection, whether it's a chemical, environmental or foodborne chemical, or even exposure to EMF.

Now in glyphosate, shown to inhibit a lot of these toxins that accumulate. So until we get rid of those toxins, then we're not going to be able to allow the body to do its job.

But now if we remove from the body the source of toxins and now we give back what's missing, body heals itself and it does its job. And it's really that simple.

Yeah. Yeah. I love this so much. This has been a awesome conversation. I appreciate your whole holistic perspective rather than like supplement supplement supplement.

It's really like this big perspective of hearing all the things that are standing in the way and here are the things that maybe you need a little bit more of to actually get the system back online and and physiology, restore it in a way that's going to support fertility and overall health, which is always related.

Yeah, that's right. Now, what we've learned in 25 years in academe is that drugs and physicians don't heal patients. Right? The patients feel them. So when if we give the body what it needs, the body heals itself.

And there is there's ways to do that. You know, and I think supplements I'm not saying that all drugs are bad and all supplements, but we we try to correct things.

And then when that doesn't work, we supplement. When that doesn't work, sometimes drug therapy is necessary. But I think that's giving using the best medical judgment of the physician to do what's best for that individual patients.

Kind of my objective is to kind of broaden the scope of the clinical picture and consider nitric oxide and again, stop doing the things that disrupted, start doing the things that promote it, that doesn't work and we have product technology that does it for you and typically that always works.

And I've been doing this for 15 years now and, you know, I get hundreds of texts and calls and emails every day of people that we've changed their lives, people who had been poorly managed and suffered from chronic disease for decades.

Now all of a sudden, nitric oxide comes on the radar, they fix it. And it's amazing. It's really transformational. So that's that's the most gratifying thing I can do.

And I'm sure, you know, you're changing people's lives every day because you know, procreation and conception and and bringing new life into this world is certainly life changing.

So congratulations to the great work you're doing and keep it up. Thank you. Thank you so much for joining me today. And yeah, I look forward to just more from from you.

I know you're just like such a leader and educator in this space, so I appreciate you. And yeah, thank you. Thank you for continuing to move the science forward.

So stay tuned.