Introduction and Patrick's breathing journey

Hello everyone and welcome to the microbes and Mental health Summit. This is Dr Miles Nichols and today I'm here with Patrick McEwen. Patrick is an amazing person who has done wonders in the world of breath and breathing.

He's an international speaker and author. Patrick, do you want to say a little bit about how you got into breathing and how this has become such a focus for you? It seems like your your main thing that you do.

Yes. My only thing, Dr Miles, and I suppose it's one of those things, if you go home to your parents as a 20 year old and you're telling them that you're going, your career is going to be on breathing, they'll probably run in the opposite direction. So people who fall into this space fall into it because of their own health issues And that was my story.

I don't diagnose sleep apnea as a kid. And into my teenage years in my early 20's and I had asthma and oftentimes the two go together because of course is a breathing disorder and obstructive sleep apnea is a breathing disorder in the upper airways, but the upper airways is linked with the lower airways.

So I was tired and squeezing a lot. I was on medication. I didn't have great focus and I would have been a chronic map reader and very much a little bit highly strong but not experiencing anxiety.

So it affected me, but yet I was able to get my degree, but it could have been easier. And then I came across there was a newspaper article about the importance of breathing in and out through the nose.

And you can imagine just reading a newspaper article, nobody had told me in the 20 plus years before that to use my nose to breed even though I was in hospital etc.

I still was persistently my breathing and also to breathe lightly because there's an idea in the Western world that the more air you breathe the better it is for you.

And I always had cold hands and cold feet and I started breathing lightly and I was able to influence the temperature of my fingers. So it was an exercise to decongest my nose and influence the temperature of my fingers. That pretty much changed my life changed my career and I take my mouth that night, which I know it sounds really bizarre just going back 1998.

And the first morning I woke up now, by the way, just for those only take your mouth if you're absolutely sure you can use your nose. I used the nasal dilator. So I used a breathe right strip to get dilation to my nose. And I put the paper tape across my lips.

And the first morning I woke up I didn't don't remember that much of a difference. The second morning. So I did it again the second night and the second morning I woke up it was the best night's sleep I've had in 15 years, something as simple as breathing through my nose.

And then I changed careers. So I trained under the Ukrainian Dr Constantine. A lot of my work initially was that people would ask me because that was a condition that I knew best. I could identify with the condition I had symptoms for years and years. And you know, we could have to improve asthma control significantly with with simple breathing techniques and you know, while the whole debate about carbon dioxide and sometimes the precise mechanism of what's happening is not fully known and that's the thing about the human body is quite complex.

We were still getting the results and showing people how to decongest your nose. And then it was in about 2007 I

started looking at more into Asthma and Sleep.

So tied in with that was insomnia, obstructive sleep apnea, and snoring. And then in 2010 going down the whole mental health aspect, anxiety, panic disorder, depression.

I remember giving courses in 2010 around Ireland here And about 3000 people attended these short courses. The topics of the courses were functional breathing and mindfulness, bring the two together.

So using breathing techniques to help bring balance to the autonomic nervous system and to improve hisley and bringing awareness of the mind and breath and body to help bring the quietness and the gap between thoughts but miles 90% of the people who attended were females men weren't attending and I couldn't understand this.

Why aren't men Once I put mindfulness and functional breathing into the title, that was it, they wouldn't attend. So then I started doing the oxygen advantage And I was writing a book at the time back in 2012, 13 took four years to write the book.

And it was very much about using breathing techniques for mental and physical performance. Now the tools were the same because in order to have concentration of the mind and focus and attention span, you need to be able to direct your attention and if you can direct your attention, it means you've got some control over your thoughts, but also to direct your attention, you need to have good sleep and you need to have balance in the autonomic nervous system.

So the very tools that we were using to improve focus and concentration were the same tools that I would use with somebody with a racing mind, but I wasn't calling it racing mind, I wasn't calling an anxiety or panic disorder.

So it's very important, you know, the language that we use and yes, so that's it's been a really interesting journey and now we've been working with some world class musicians and special weapons and tactics.

Some of our instructors, military snipers, I've worked with today, I did a talk to a large multinational company. So for me it's really about the awareness of giving people simple breathing tools to change states And as I said today earlier on, when I was giving a talk to employees, you know, we spent 16, we spent 12-16 years in formal education and yet we're not trained how to concentrate.

We also spend a lot of time in university and learning to up skill and about whatever skill that we focus on, but we are not trained how to deal with stress.

And it's really important that we as human beings that we understand that by changing your breathing patterns, you can interrupt regulator down regulation and you can help to counter the daily stresses because chronic stress is not good.

We all know that Yeah, that's there's a lot there.

Breathing, asthma, and sleep apnea basics

And the title of today's talk is breathing to change states, but there's so much that you just went over because it is not just about state change. Even though we're going to talk about state change, it's about health, it's about chronic health concerns. You mentioned your personal struggle with asthma, had asthma as a kid to asthma and eczema were something I was dealing with as a kid and no one pointed out sleep apnea as a potential issue to me either.

And I had even in early twenties chronic fatigue and I went to a sleep specialist, he asked me if I snort and when I said I didn't snore, he didn't decide he decided not to test for sleep at me just because I didn't snore and it it took me another almost 10 years before I did a sleep study out of curiosity and found that I had between moderate and severe sleep apnea.

And so it really took a long time for me to figure that out. And as you mentioned there and I had changed the nose

breathing and the aspect of breath had I had been years and years without and then later without any medication for asthma. And I don't even think of myself as having asthma anymore. And that is fantastic.

And you mentioned that that work was part of what you were doing with people. And I know there's peer reviewed clinical trials on boutique oh, breathing with asthma. So it's very much a research based thing.

And you mentioned the warming of the hands and you mentioned the unblocking and unclogging the nose. And that's something that in the clinic, when I teach people these breathing techniques, I find that those are, they're almost like positive symptoms, that people can know that they're doing it well if the nose on blocks and if their hands start to warm and the opposite is that the symptoms of asthma or of hands being cold feet being cold or of nasal congestion can also be a symptom indicating the need for breathing practice.

Because often those occur due to improper breathing and the topic for the whole summit is microbes and mental health. And you also touched on anxiety. You touched on the press and you touched on the nervous system, we know the nervous system and immune system are intimately connected and that people with this regulated nervous system function often have an impaired immune function that can lead to infection. And so we're tying it in on multiple levels here together to understand that this racing mind and you may talk about the mental performance, which is great for certain people want to hear that mental performance piece, but we're gonna have people here, some of whom are struggling with chronic health conditions and they're at the bottom and some of whom are looking for optimization and longevity and peak performance and correct me if I'm wrong. But I believe that what you're saying is that the same techniques apply.

We use about 25 different exercises and expanded these over the years. Even though my initial training was with Beauty Co. Which is a wonderful technique, but because it's grounded in tradition, I couldn't change it.

So it ended up that we set up, we have you take oh, anyway, which I was teaching anyway, but also oxygen advantage, which is an evolving breathing technique. And I have worked with people with chronic fatigue syndrome and, you know, I've made plenty of mistakes with breathing exercises.

Like I'll give you a couple of examples, There's always a few cases that kind of, you could have done things better. I could have done things better, but it's from working with those individuals that it gave me a better understanding.

Sometimes we feel that breathing exercises are, you know, we don't we don't often give credence to the power of them and sometimes we should be treading with more caution.

So I remember 30 year old a man coming in and this guy was an athlete but he was an athlete who was over training and overworking. And it was often that almost that he was burning the candle at both ends and he developed chronic fatigue syndrome.

So he came to me and I'm in my head thinking, okay, this guy's an athlete so I can push him a little bit. And I gave him quite strong exercises because what I want to do is I wanted to disrupt homeostasis.

I want to stress him out too cause the body to make those adaptations. But I overdid it and I completely floored him and he never came back to me. So that was one aspect of it. And then because working with chronic fatigue syndrome and also more currently as long covid, which is very similar in some respects that there's that this regulation of the autonomic nervous system, we now go so gentle and we start off with small little breath holes because anxiety can be a component here. And often times when there is anxiety, even just focusing on breathing can make the person anxious.

I don't want to tax the autonomic nervous system any further. So for me the exercise is to help bring balance to the autonomic nervous system is exercise about recovery and stimulating the vagus nerve. But doing it so gentle and doing it to the point that if the person finishes the exercise they have enough energy that they could do the entire exercise again.

Because I don't want to be pushing them over the edge. We want to get them to that point little by little dipping the

toe into the water. And I'll show you this exercise and you probably know it anyway, you're probably teaching it. It's a small breath holes which is a wonderful and simple exercise when the mind is racing and that breath hold on.

The exhalation is the same as having an extended exhalation which can help stimulate the vagus nerve. But the beauty about this exercise is it's gentle and you don't have to pay attention to your breathing to do it.

So it can be quite helpful for anxiety. The exercise goes as follows. You take a normal breath in through your nose and out through your nose and pinch your nose and hold 54321. Let go and just breathe.

And now you're just breathing normally for about 2 to 3 breaths. And it seems so simple. And again normal breath in through your nose, out through your nose, pinch your nose and hold 54321. Let go but breathe in through your nose. And now you're just breathing normally for 2 to 3 breaths and somebody coming in with COPD or severe asthma.

I would sometimes have them do this exercise for 5 to 10 minutes every hour. And I know it sounds a lot because but they're breathing can be quite labored and I want to help bring that nitric oxide from the nose.

So during the breath. So you're taking your breath in through your nose and a breath out. And we pinch. Now nitric oxide is pulling inside the nasal cavity.

We let go of her nose and we breathe in. We're carrying that nitric oxide into the lungs to help achieve some bronco dilation and visa dilation. So it helps to open up the airways and the small blood vessels in the lungs. And it also helps to redistribute the bloodshed the lungs antiviral. So that would be an example of an exercise that people could do in a very gentle way, especially if they're feeling that, you know, and that's the beauty about breathing exercises.

You can tweak them according to the the age and the health and the breathing of the person. Now we use the breath hold time always to get an idea of where a person is at.

And it would be the control post from Utica which is basically normal breath in and actually holding the breath and timing it in seconds. How long until you feel the first step in. The desire to breed with long covid.

We've seen breath hold times as low as four seconds when a person can only hold their breath for four seconds after an exhalation, you know, we have to go very, very gentle and it gives us some feedback in terms of then.

Well, how are we going to help stimulate the vagus nerve here and to help with recovery? And it's going to be over a period of time. Wonderful. Yeah. So we're talking a couple of concepts that I want to make sure people understand. So we're talking about nitric oxide, we're talking about the vagus nerve. So the vagus nerve, that's the nerve that connects the brain to the heart and the lungs and the gut.

They're actually a couple of branches and more contemporary understanding the myelin ated branches that are newer in evolution with the mammals. And then so those older branches that are UNM I eliminated that have slower movements.

And there have been quite a number of studies and research on especially heart rate variability and heart rate, coherence with a measure for how or reflection for how well functioning that vagal connection is and we have lots of data showing higher heart rate variability and higher heart coherence associated with positive health outcomes, positive mood and better immune function.

There are a number of studies that show if we can increase heart rate variability that we're actually improving function and interestingly heart rate variability now is being used for recovery as well.

If someone's worked out too hard, The heart rate variability is a little lower and they know don't work out yet or let yourself recover more before you work out again in order to be giving some degree of and you mention this sense of a stress, a healthful stress which we could call a hermetic stress.

This concept of form Asus is this little bit of a stress that makes you stronger best. Easy example, people understand almost everyone is you lift weights, you stress the muscle, you break apart some muscle fiber, but that response is the body grows stronger muscle as a result, as long as you don't go too hard and don't injure yourself, you end up with stronger muscles as a result. And it sounds like there's an correct me if I'm wrong. But the principle is the same for someone who is chronically fatigued and anxious versus someone who's looking at higher performance.

They're different techniques and we're pushing that hore missus and hore medic stress more with someone who's well functioning, longer control, pause, athletic than we are. For someone who's really have a short control pause can only hold a few seconds before that urge to breathe.

At first definitive urge to breathe is someone who we only want to very gently push. And there's that maybe zone of what's a challenge, but not going to push a person over the edge into dis regulation of the nervous system.

There's like a window or a sweet spot to where it's a little bit of a challenge but not going to dis regulate and that there's in that window that window is smaller for people who are in that chronically fatigued and ill zone. And that window might be a lot wider for someone who's more resilient and has been doing exercise and who has this stronger capacity for oxygen and CO. Two tolerance.

And so I'd love to get a little bit into the physiology. You mentioned nitric oxide from pinching the nose as you hold on the exhale nitric oxide generating building up in the nose.

And we know nitric oxide is so important for heart health. We also know for circulation. We also know that nitric oxide has a role in infections. And so it is important that we have people understand a little bit of it because I think nitric oxide issues are one of the big issues.

Gentle breath holds for anxiety and recovery

We obviously heart disease is number one killer and we know that infections and circulation problems are big issues for how the immune system gets blood flow.

The white blood cells need to get to the areas to have the effect. And so for infections it's so important to to have proper blood flow and circulation.

So you mentioned nitric oxide and I'm curious if you want to talk a little bit about either that or oxygen and C. 02 and CO. Two tolerance. Some of the physiology behind what we're doing with these actual breath holds and breathing through the nose and and this kind of thing, I suppose it starts it always starts with nasal breathing and I'll always put the question out to people. You know, what does your mouth do in terms of breathing? What part of your mouth is devoted to serving any purpose for the breath?

There's no structure in the about that's devoted for breathing. So the mouth is simply a hold. And I don't mean to be crude when I say that the mouth is simply an entry point there can go straight down your throat into your lungs and it should be used only in times of emergency.

Our nose does all the work and I think people don't realize that the nasal airway is sitting above the roof of the mouth. So often I ask my students put your tongue up into the roof there matt and drag your tongue along the roof of your mouth until you feel the soft palate and sitting above the roof of the mouth is the floor of the nose or the roof of the mouth is the floor of the nose.

So you can think of all of this space in the nasal airway. It's known since 1988 that the partial pressure of oxygen in the blood increases by 10%. With nasal breathing versus mouth breathing nose breathing.

Also, you've got a better recruitment of the diaphragm and a very simple way to ascertain this is looked down at her chest and take the breath through the mouth.

So when we look down at our chest and we breached them out very often we will see that mouth breathing is engaging more higher up. And mouth breathing is a faster breath.

So we're breathing faster and we're breathing up her chest and this is activating as an increased sympathetic drive. So this is a stress. Mouth breathing for me would be seen as a stress and in terms of then switching to nose breathing, you've also got the benefits of nasal nitric oxide and redistributing the bloodshed the lungs.

But if we do physical exercise with the mouth closed, we have better recruitment of the diaphragm. And the diaphragm isn't just for respiration but it's also assisting in lymphatic drainage.

The diaphragm is also connected with the emotions. So for example, the frantic nerve which links the brain, the medulla send signals via the frantic nerve to the diaphragm as part of breathing.

But then we think of the word schizophrenia schizophrenic. So it is true for people to take a deep breath. But the problem is that people often misinterpret so breathing is multidimensional, we have to think of breathing from a biochemical dimension.

And what I mean by that is biochemical dimension is focusing on what is your sensitivity to the accumulation of carbon dioxide in the blood from a biomechanical dimension is whether we are breathing higher but good recruitment of the diaphragm and from a psycho psycho physiological dimensions, the connection between their psychology and physiology and vice versa.

So I always will work with people from a biochemical dimension first. Because what I want to do is I want to help reduce their chemo sensitivity to carbon dioxide. And even though it's not studied all that much, there seems to be an inverse relationship between the chemo sensitivity of the body to carbon dioxide and the sensitivity of the barrel reflects so the pressure receptors in the major blood vessels. We want them sensitive to notice the fluctuations or changes in blood pressure.

To be able to keep help keep your blood pressure normal because that gives us very good feedback of the balance of the autonomic nervous system whether you're in that fight or flight or if you're in balance so we do gentle exercises to increase carbon dioxide in the blood.

And the premise behind it is that as you practice breathing a little bit less air And you're increasing c. 0. 2 in the blood that your body adapts to tolerate a higher partial pressure of carbon dioxide.

And because carbon dioxide is the primary driver to breed, if you can tolerate higher C. 02, then your breathing is going to be lighter and slower but lighter and slower breathing is tremendous for mental states.

It's almost that how we breed is a reflection, the speed and depth at which we breed is a reflection of what's going on in the mind and vice versa. If I breathe hard and fast, it's a stressor my brain picks up on my breathing.

So if I started breathing hard and fast now my brain is picking up that I'm stressed and the brain is going to go into that more of a fight or flight response.

Whereas if there was a difficult situation happening, I will always say to my students, there's something happening on the outside. Bring your attention inwards. Nobody will even know that you're doing it.

Have your attention on the breath, take a normal breath in through your nose, even a soft breath in through your nose and have a really relaxed and slow, gentle breath out because when you slow down and soft and the speed of the exhalation.

Now your body is telling the brain that things are okay, you're stimulating the vagus nerve. Now you could go one step further. And this was the exercise that really kind of got it home to me.

It was about breathing less air because how many times are we told to breathe lesser, hardly ever. We're always

told to breathe more air. You go down to the local yoga studio and the chances are you will hear people breathing.

Do we need to hear people breathing inside in the yoga studio? Do we need to hear people breathing during any practice? Because what is happening when we hear people breed too much carbon dioxide can be removed from the blood through the lungs and carbon dioxide isn't just a waste gas, but it plays a role, invasive dilation of the blood vessels.

It plays a role in the release of oxygen from the red blood cells to the tissues and organs. And also, if we're breathing too much air and blood behavior is increasing, it causes arousal of the central nervous system and chronic hyperventilation.

The kidneys dump bicarbonate to bring down a normalized blood ph but now we're left with a reduced buffering capacity and then as a result, it can lead to an increased lactic acid.

So I know I'm going a little bit too much into the science there, but explain it very simply here. There's ways to up regulate and there's ways to down regulate.

If we want to stress the body and mind through the breath, we can do it two ways. I can hyperventilate deliberately to stressor. Or I could breathe in, breathe out and hold my breath and do a long breath.

Hold and lower my blood oxygen saturation. It's a stressor. It's good for people to do that when they're young and relatively healthy. And I will come back to the point that you made dr miles.

We have to be careful with stress or breathing exercises, especially if the autonomic nervous system is already taxed. So how can we help to recover Light breathing small reptiles, slow breathing relaxation, humming on the exhalation, gargling massage, slowing down the respiratory rate to if if the person can do it because sometimes they can't to between 4.5 and 6.5 breaths per minute.

Getting to that nice average of six breaths breathing low. I use the acronym LSD because people remember it, especially if there were wild teenagers. Light is about breathing from a biochemical dimension.

Slow is about softening and slowing down the breath, especially the exhalation. So for us the exhalation is really important. If I breathe out fast, my body is telling the brain that the body is under trash.

But if I breathe out really, really slow, you're stimulating the vagus nerve. It's creating a settled calling. It's bringing down the heart rate. And in terms of bringing balance to the body, it's tremendous.

Now I would go as far as asking a couple of questions like in terms of heart rate variability because people have the devices which you give your feedback and very often and the emphasis on which optimizing heart rate variability is to breathe slow to six breaths per minute. But not everybody will do that, especially if they're control. Cause is very low.

And for me breathing is not just a formal practice Breathing is you have it with you 24 hours a day. You can have a person who is breathing slow to six breaths per minute, 10 minutes or 20 minutes daily.

But then they're sleeping with their mouth open and stopping breathing during sleep, which is going to lower their h. o. v. Or they get into a tricky situation and they respond with hyperventilation and that's going to put them into that stress response.

So for me breathing isn't a technique that we do. But it's a simple understanding and it's an understanding that we can change our breathing to change our physiology and to get balance. However we cannot look at breathing and isolation of the mind and we cannot look at breathing and isolation of sleep.

So today I had 100 people and I always kind of do this example and the doctor asked you do you snore you know? So I asked the group of people I said I would like you now to snore through your mouth and it goes like this so

they're all snoring with their mouths open. And then I asked them close your mouth breathe through your nose and try and snore through your mouth with your mouth closed.

Try and snore through your mouth. So mouth snoring we can stop once we get them out closed We can start with 100%. You cannot snore through your mouth if your mouth is closed.

No snoring it goes like this. And then I asked him take a very soft and slow gentle breath in through your nose and really relaxed and the slow and a gentle breath out and a soft and slow gentle methane and relax and slow gentle breath out And as you're breathing light and slow and soft, Try and snore through your nose and you'll find it's more difficult because oftentimes with snoring we put it all down to the anatomy of the airway.

And of course the anatomy of the airway will play a role. Deviated septum, high upper polish infringed nasal cavity, nasal polyps, rhinitis, all of that stuff compromises the nasal airway.

But it's only one part of the puzzle how we breed during rest during wakefulness will influence how we breathe during sleep. If we have faster breathing, harder breathing, mouth breathing, irregular breathing during wakefulness, we will have faster, harder mouth breathing during sleep.

Nitric oxide, CO2 tolerance, and nasal breathing physiology

And that's increasing turbulence and also as that air is drawn into the lungs. There's an increased negative pressure which in turn is contributing to collapse of the upper airways. And in one way it's good that the field of sleep medicine, especially obstructive sleep apnea, It has changed a little bit since 2013 since one researcher, Danny Eckert talked about phenotype of obstructive sleep apnea.

He talked about secret and aroused the threshold loop gain and muscle recruitment, but breathing during the day can influence of each of each of these phenotype sis So in terms of mental health, there's questions we need to ask.

Somebody with depression coming in and they're feeling tired. Is it depression which is causing fatigue or could that person have obstructive sleep apnea, which is causing fatigue.

They can't focus. They can't cope in their daily life. They're irritable because the symptoms of depression and sleep apnea can be, there's a commonality there.

So there's a bidirectional relationship and it is more common with people with depression that they have obstructive sleep apnea than the normal population.

But PTSD post traumatic stress disorder. I've seen papers with obstructive sleep apnea as high as 73% of those individuals. Now we asked the question, can we address depression and PTSD if we forget about sleep? If we overlook obstructive sleep apnea.

And the other question to ask is 75% of the anxiety and panic disorder population of dysfunctional breathing, 75%. Cognitive training does not change respiratory physiology.

Can we really address mental health issues if that individual continues to have dysfunctional breathing? If they continue to breathe a little bit faster and it's not that they are having a panic attack.

It's just the respiratory rate is faster. They have a stronger chemo sensitivity to carbon dioxide. Their breath hold time will be lower. They're breathing more upper chest. They're breathing irregular and that breathing pattern is feeding into their stress response. Their stress response is feeding into their breathing. Their breathing pattern is feeding into poor sleep and poor sleep is feeding into the stress response.

We need to look at human beings not just as one thing, not just as one function because we can't isolate one function from the other and breathing is certainly one function we should be looking at. That's amazing.

So many connections there. And so much of the time it's easy to get a little bit reductionist IQ. Especially in the medical world of to have one hammer that you're trying to use for all ailments.

And sometimes and I know I was actually when I had chronic fatigue and I went to the doctor and I got my blood tests and they looked at thyroid, they looked at cbc cmp, the basics and they said everything looks normal.

Maybe you're depressed. And I said well no I don't think I'm depressed, I'm tired. And that fatigue can couple with a sensation of depression. And again at the time I didn't know sleep apnea was a problem for me and it took a long time to figure out that sleep apnea was playing a role. And many other things were playing a role too that I found later. And breathing is almost like an access point into, it's not almost like it is an access point into the autonomic nervous system where you can't, most people at least can't say heart rate slow down.

They can't say blood pressure go down a bit please. They can't say circulation, go to the fingertips because my hands and feet are cold. However, people can consciously slow the breathing which then can increase nitric oxide which then can increase circulation to the fingertips can affect those barrel receptors and get the blood pressure regulated can impact the even thoughts. Even nervous system function that vagus nerve function and and you mentioned the sleep and the sleep aspect of you're not gonna breathe five minutes during the day. In a way of a practice that then overrides the whole evening of mouth breathing or a sleep apnea is obstructive or a faster respiratory rate throughout the day.

And so in a way you're saying that it seems to me that there's a way of life that can be that that that the training. So the you mentioned the ceo to tolerance in the brain, it's carbon dioxide that triggers the breathing response.

Not low oxygen. And that's one thing I don't think a lot of people understand is that the brain it's not the oxygen level that triggers the the feeling of the need to breathe. It's actually the carbon dioxide level.

So you could have just fine, just fine oxygen levels. But the brain could still perceive a need to breathe because of low C. 02 tolerance. And my understanding is that C. 02 tolerance becomes low in part as a result of trauma and stress and illness and infection and all of these kinds of things. And then that creates a loop where the brain is saying breathe before C. 02 levels are optimal for circulation for health for relaxation for the nervous system function in the more parasympathetic and vagus nerve activation side of things is not being ever.

It's this new homeostasis of living in stress living in chronic stress. And I think a lot of people resonate with I live in chronic stress. They can feel that but they don't know how to get out.

And you're mentioning oh well you can do cognitive techniques and that can help but it won't necessarily change the respiratory rate and without changing the respiratory rate there may still be a level of physiologic stress. Even if mentally you're positive positive outlook mentally and you've done a lot of work there there may be a physical physiologic adaptation that's still living in physiologic stress and breathing is an access point to the physiology and it can really direct the impact the nervous system function, regulate. And if people can almost train and tell me if this is on track that if through training to bring that.

So to tolerance up a bit to push to get a little bit of air hunger not too much not going overly stressed especially in the beginning but to go right between air hunger.

But before panic in that in that range and and to to ride that range a little bit and two edge in that range. That then the brain starts to say oh I can tolerate a little more C. 02 before the urge to breathe and that oxygen isn't even in this equation of that much that it's not that low oxygen is the reason why you're needing to breathe. It's that C. 02.

And you bring it up little by little in terms of tolerance over time and now all of a sudden the basil respiratory rate without you thinking about it without you being conscious of it has slowed because the brain now waits to have that urge to breathe subconsciously until a higher level of C. 02 has been reached.

Does that on track? That's absolutely it. And what I might do is I might just guide you know listeners just through a very basic exercise to experiment. Obviously don't do this if you're driving your car whatever but you're sitting down

you're comfortable enough.

You might even be watching a little tv just even you could put one hand on chest, one hand just above the navel And you're just tuning into your breathing pattern.

And you could even exert a gentle pressure with your hands against your chest and tummy. And this can help if a person isn't very aware of their breathing.

So you're exerting a gentle pressure there and as you're exerting the gentlest of a pressure that you're feeling a slight resistance to your breathing so often then slow down the speed of the air coming into the nose and allow a very relaxed and a slow and a gentle breath out and when you're breathing in and don't worry about getting this perfect.

It's not about getting it perfect. It's about just playing with a little bit because there's times that the air hunger might get a little bit too much and then you take a rest, there's times that the air hunger isn't enough.

And then you have to soften your breathing a little bit more. So on the breath in, we're taking about 70% of the breath in. So instead of taking a full breath or a normal, you're normal sized breath, taking about 70%,, 70% of the birth in and it really relaxed in a slow and gentle exhalation And using your hands as a guide so that as you're breathing in your breathing against your hands. And the objective is to breathe in about 70%.

And then on the exhalation you're really having a slow and relaxed exhalation and imagining your die from is moving back up to its resting position. And then you're taking that soft breath in soft breath in and then a really relaxed and slow gentle without the objective here is to have that air hunger.

But air hunger can be subjective. Don't feel panicked. So if a person feels panicked, especially if people have a history of trauma or panic disorder or anxiety, they can have an exaggerated response to the feeling of air hunger.

So for those group of people, we have to go very easy because if I give them too much air hunger, it puts them into a fight or flight response. I want to put people into a state of tolerable air hunger.

And as they're doing it is to pay attention to this live in the mouth as we do that exercise that really soft and slow, gentle back then and relax and slow gentle breath out very commonly that people feel sleepy. We know that we have activated the rest response but they also experience increased watery saliva in the mouth.

We know that we have activated that digest response and this is a breathing exercise that goes beyond just observance of the breath that were deliberately slowing down and breathing less air. Because carbon dioxide is also considered to be vega tropic.

Now carbon dioxide isn't the full picture but it's a part of the picture. We don't fully know what's going on. I think a big part of what we are doing is helping to bring that balance to the autonomic nervous system in terms of stimulating the vagus nerve and improving the sensitivity of the barrow reflex.

And the other thing about it is that, you know when you have your attention on your breathing and you feel their hunger, your mind tends to be more anchored onto the Brett.

But physiologically when you're really softening and slowing down your breathing and carbon dioxide is increasing in the blood, it's helping to increase blood flow and oxygen delivery to the brain.

And this can have a calming effect. And there's one more thing that's going on. Were deliberately putting a person into a state of mild discomfort because air hunger it's not the most pleasant even though it shouldn't be stressful in any way.

So we're deliberately putting them into a state of mild discomfort and they are surrendering to the feeling of discomfort. Training the brain not to react to discomfort. So I think there's a bit going on.

We're desensitizing their reaction to suffocation. We're helping to reduce the chemo sensitivity to carbon dioxide and the benefits of this is that even after the practice, the slower breathing, the more one practices it, slower breathing then becomes a more natural way of breathing.

Now for some people, you know, people coming in with anxiety and I have them do this exercise and they don't like doing it at all. I said listen, don't worry. We can do with some small toes.

We can have your breathing and home on the exhalation because as you're humming on the exhalation, you don't have to think about your breathing. And you could do it in the shower, you could even go for a walk with your mouth closed.

One of the best breathing exercises of all because when you go for a walk with your mouth closed, you're breathing in and out through your nose. Your nose is imposing your resistance to your breathing and it's slowing down the breath.

You're adding an extra load onto the diaphragm. But as you do physical exercise, you're generating more carbon dioxide. So nasal breathing during exercise combined with increased production of carbon dioxide because of the increased metabolism will also have to reduce your chemo sensitivity to carbon dioxide. And more recently there's been studies that looking at inspire a Torrey muscle training as a means of helping to lower high blood pressure.

Now, I would have never put inspired muscle training to lower high blood pressure. Okay, I would have said yes, better recruitment of the diaphragm, slower breathing, lighter breathing. If we can help to reduce the H.

I. That of course can contribute all of those things could contribute to lowering high blood pressure. But if you go for a walk with your mouth closed in a way, it's inspired your muscle training because you're breathing against resistance.

Now we do have some devices as well. But walking with the mouth closed is one of the best exercises any of us can do. And when you go for your walk with your mouth closed, don't just do your walk with your attention stuck in your head.

Walk with every cell of your body, have your attention out of the mind and onto the bread. You know what dr miles. I don't know why this has been held back for decades because these are simple tools that we should all be aware of.

Something has held back breathing. Something has held it back and we have to forget about that nonsense. Your stress. Take a deep breath. The instruction is correct. But the interpretation is not correct.

I'll give you an example. My own personal example, I was going in to do an exam 1996 97. I already was that kid mouth breathing. Poor sleep, upper chest breathing fast breathing. Not a good position.

I was stressed going into the exam. I took a walk for about two minutes before the exam hall and during that walk I took these fall big breaths and I walked into the exam hall and I can remember being very disoriented inside. Now, why is there a belief endemic that the more air we breathe, the more oxygen that's delivered.

It is not correct. And we have to turn that upside down. Yes. If you start hyperventilating it's a stressor, but do that in controlled doses and that needs to be controlled.

Absolutely. And there's also this, you mentioned just a H I want to make sure people understand what that is. Apnea, hypoxia index. So like it related to sleep apnea.

There's how many drops in oxygen saturation are there through the night when people are holding Their breath in oxygen enough for oxygen to drop 3% the saturation or 4% the saturation.

And so that is an indicator usually of mouth breathing, leading to an obstruction in the airway, leading to breathing,

stopping for a time and that's dysfunction Breathing in the evening. That's measured by H. I.

Yeah, you can still have so say an apnea is when you stop breathing for 10 seconds. If it's obstructive it's because of collapse of the upper airways.

Now, you could have see here's where sometimes it falls between two stools. You're a slim guy. And normally we think that people with obstructive sleep apnea, that it's only relevant to people who are obese.

But 50% of people with sleep apnea are not obese, and 25% of people with obstructive sleep apnea don't have subjective nor objective sleepiness get through their day.

So mouth breathing of course, definitely it's going to be a contributory factor but anatomically the airway as well, tongue posture, tongue has to be on the roof of the mouth.

Otherwise there's a risk of falling back into the throat to die from breathing. Muscle is also linked with the upper airway dilator muscles here. So you can imagine I'm nearly 50 years of age. So once we hit a certain age we start putting a bit of weight on the belly.

This impinges movement of the diaphragm. We tend tend to be breathing more using the upper chest and as a result in the throat is more liable to collapse So mechanically the throat is stiffer and dilated when we have good function of the diaphragm.

See we can't we you were talking about, we need to see all of the connections here, but we also need to see the connection between the upper airways and the lower airways.

Sleep apnea, daytime breathing, and treatment options

But if you go to a hospital and you're looking for help with your upper airways, you go to an ear, nose and throat doctor. And if you need help with the lower airways you go to your pulmonologist.

But there should be there's one airway. There should be one doctor. Yeah, absolutely. And interestingly for me I noticed my H. I. My score related to apnea is a lot higher at higher elevation. I live at about 8500 ft elevation.

And even going down into Denver which is really close to me just in the mountains above Denver. And that's 5200. My H. I. Is much different there interestingly even just a few 1000 ft elevation difference.

And so that's another piece that, yeah, so I wonder what's driving that. So what one could argue that as you a sense that your breathing is getting a little bit faster and harder to compensate for the fact that the air is thinner and it's the faster and harder breathing that's contributing to the negative pressure.

Now, as men, we should always wake up at our tongue resting on the roof them out. And I don't want to sound too crude. Men should always wake up with an erection in the morning and any man who is sleeping with his mouth open and maybe this is the best motivator for men to get their mouth closed if you're sleeping with your mouth open.

If you're waking up feeling lousy sleep, you know, you don't have an erection. And the problem with that is it tells you that the blood vessels aren't working as well as it should be that the autonomic nervous system isn't in as good a balance.

So men keep an eye on that. It's an important one. And how can people better? Because obviously if people are training and doing some of these exercises, these simple exercises that you've talked about during the day that increases the CO two tolerance in the brain.

And people are now starting to naturally throughout the day because they're practicing regularly. They're starting with that increased CO two tolerance to breathe more slowly. And that's helping calm the autonomic nervous

system and calm the activate the vagal nerve response and increase nitric oxide.

Like we've talked about increase the blood flow to the tissues, increase the blood flow to the male parts for males and and and help all those areas. Which is fantastic and amazing. But then if if during sleep there isn't that saying? Because there's even though the CO two tolerance has increased, there's obstruction which isn't related.

So how do people how can people keep their mouth closed at night? Not everybody needs to wear tape. It's it's very difficult to know the instance of oil breathing in the population. But there's been a few studies and it's shown that men over 40 and I could include women. I can't remember exactly.

But for six times more likely to spend at least 50% of the time breathing through an open mind during sleep. So it is something that seems to increase as we age now. I can only give you my own observation from 20 years. Working with people coming in, 50% of the people coming in the adult population coming in.

Wake up with a dry matter in the morning. I think this could be reflective of the real population because I've seen A lot of individuals. The only thing is the people who are coming in to me are coming in with problems. So it might be slightly skewed.

But even with that 50% of people coming into me are waking up in the dry match in the morning. And for me, one of the best tools. A simple tool is is wearing a tape now before people feel, Oh my God he's saying tape up them out.

I'll just give you one example of the tape that we use. And this is my own tape. So I'll make a full disclosure on that. It's called MyO tape. And it was my oh tape. Because working with Children who were also undergoing myO functional therapy, We wanted to help the Children restore nasal breathing.

It wasn't enough just to treat the nose. If you treat the nose of a child, it doesn't mean that you changed the behavior. I had an operation on my nose in 1994 And the surgeon did good work on my nose.

But the surgeon never told me to breathe through it afterwards, 95 96 97 98. I still not breathing. So that's unfortunate. Now the tape that we use is my oh tape. So you see this one here and it's an elastic ated cotton tape. Now I've got a beard.

So this color isn't good for the beard. The blue one is more better for the beard, but it'll give you an example of it. So I'm stretching the tape about 40 and covering the top lip in the bottom left its surrounding my mouth. Now it's not covering my mouth and because it's stretched it's pulling my lips together.

This is a milder tape which is is with facial hair. The blue color is better, which is our next one. But it's still pulling my lips together, I can feel the tension and when I talk with physical physical therapists or physiotherapists, they tell me it's stimulating the virus Oris muscle, which is helping to improve tone.

So I'll always say to my students, I need you to wear tape on your mouth for 2 to 3 months because that's the length of time that we need to try and change a habit.

And the only way to find out that if your sleep is improving now, by the way the few understood it's very understudied Looking at what happens when you get them out closed during sleep. The A. H.

I reduces by about 33%. So that was in mild to moderate sleep apnea but that's just getting them out closed. We also need to get the tongue into the roof them out.

You should wake up with your tongue on the roof of the mouth in the morning if you're walking down the street lips together, tongue on the roof them out.

But what happens when you increase your control pause? So most recently for obstructive sleep apnea. Because this is a condition that is so common. It affects 25 to 50% of the male population depending on age And postmenopausal women. When progesterone is leveling off obstructive sleep apnea increases by 200 – 300%.

And there's an association with obstructive sleep apnea and this regulation of the autonomic nervous system and hot flashes. So for both women and men it's more common a condition that we often give credence to.

So it's one that's really important to address Harvard medical doctor Messina. And I can send you on the papers later he looked at one phenotype and sleep apnea called high loop gain. So it's called loop again.

But he asked the question how do you measure it and you can measure loop gain by the length of your back full time during wakefulness. So if an individual breathes in and out of the nose and holds their nose and their timing and in seconds. How long can they hold their breath for comfortably if it's less than 20 seconds, it is telling me.

And especially if it's done around 10, 11, 12, 13, 14, 15 seconds or less, it's telling me it's a good indicator that this person has what's called high gain. Now, the thing about high loop gain is that it's a non anatomical phenotype or characteristic, but here's where breathing exercises can play a role.

You practice really breathing slow and breathing light during the day, at different pockets during the day, you go for your walk with your mouth closed, you're sitting down in the evening and you're slowing down your breath down, regulate before you go to sleep. Which was helpful for people with insomnia.

And by doing that, your control cause increases and your breathing is becoming lighter and slower and that's helping to lower highland games. So, you know, that would be a very specific phenotype that's influenced their all influenced because nitric oxide too, is an american messenger stopper.

Our the later muscles. And the other thing is if you have high loop gain, Your breathing is very unstable. The carbon dioxide during the stopping of the breath goes too high.

But then when you resume breathing, you have such exaggerated ventilation, your carbon dioxide goes too low and what carbon dioxide in the blood is too low.

The brain doesn't send a signal to breed. And this can be a central apnea. And when the brain doesn't send a signal to breed the output from the brain to the upper airway. Dilator muscles is reduced.

So again the final types are overlapping And is that central apnea. Trying to compensate for the overarching rocio to to bring back so C. 02 levels without the obstruction piece. But the brain is saying hey we need to hold the breath to do this during sleep. Since wakefulness the respiratory rate is too high, the C. 02 is too low.

And and even when doing basic blood panels like CMP, a comprehensive metabolic panel, I look at the sodium potassium, carbon dioxide and chloride and there's a ratio between those that's called the anti on gap and the anti on gap is a sign of metabolic acidosis.

And the way that gap is calculated is it takes sodium minus chloride minus carbon dioxide. And the higher the number the more the an ion gap meaning the lower the ceo to the higher the an ion gap, the more likely there is to be metabolic acidosis.

And I see this frequently in people who are chronically ill have a high an ion gap meaning a metabolic acidosis. And the you mentioned earlier that and you've touched on this briefly and people might have missed it because it's complex physiology but that carbon dioxide while respiratory acidosis would be higher dioxide.

Carbon dioxide, the metabolic acidosis actually C. 02 axis a buffer and helps to lower the ph within the metabolic function. And that metabolic acidosis which can become a hypo and under acting metabolic function is driven largely by low C. 02 levels.

And so we do want to cultivate those higher two levels for metabolic function as well which is our main topic today. But I wanted to mention that briefly.

And you had mentioned that. So sleep and during the day breathing being two of the most important. You briefly

mentioned with Children also that we can do this. Anything else that you think would be really helpful if we're going to give core things okay. Get your breathing regulated during the day to slowed respiratory rate.

Get nasal breathing happening and especially even through the night and maybe get a a sleep. Sleep studies are so easy and simple now that you can take you can you don't have to go to a hospital. You can like in our office we have a device called the sleep image. It's a ring.

People we mail it to people or they pick it up from the office they wear it overnight for one night and they bring it back and we have a report and that report shows the oxygen levels in the heart rate throughout the night. And we can see a lot from that.

So it's not complicated to do a nocturnal oximetry sleep study for one night. So that's a way that someone could help diagnose what's going on on the sleep side.

And then the control pause it sounds like is a way that people could diagnose during waking breathing if that's an issue. How else might people know there's an issue?

And and and if they've gotten the daytime breathing dialed or better and they're practicing that and the nighttime breathing. Is there anything else people should know in this realm? I think it would be very interesting to a baseline sleep study and then make changes to your breathing for about two weeks and see the difference in terms of the H. I.

So say for example on day one you're sleeping you have normal sleep. Whatever your sleep is it could be your mouth is open, low tongue resting posture, breathing hard breathing upper chest etcetera.

Get your H. I. And then for two weeks switch to nose breathing both during the day during physical exercise and wear tape around the motor across the lips.

If you're comfortable with it. During sleep, your nose won't congest as long as you're breathing through it. And if your nose does get stuffy you can have to open up your nose by simply holding the breath. You take a number breath in and out through your nose. You pinch your nose and hold and you gently nod your head up and down. Don't do it to the point of extreme but the breath hold there until you feel say moderate air hunger will have to alleviate nasal congestion. So you're sleeping with your mouth closed, your tongue is in the roof them out And then during the day Practice a 15 minutes two times daily of light breathing.

Just like breathing. Don't don't worry about breathing low or anything like that. Just taking a sock within a really relaxed, slow gentle by that air hunger is the key.

And then get out for a walk and even just a simple walk. Walking with the mouth closed for 20 minutes or half an hour daily. Keep your mouth closed, but breathe slow and low.

So say for example if you had your hands either side of your lower ribs and as you breathe in you're feeling your ribs gently moving out. Now you don't have to be walking down the street with your hands either side of your lower ribs, just direct your attention to that area and to be breathing lower but not to hyperventilate.

Now you do that for two weeks and then do the second sleep study. And I would say that there will be a significant difference in lowering of the H. I, significant difference.

And I think it's important because then we have some degree of understanding about the connection between our breathing during wakefulness and now Dr Miles.

This has never been studied okay, I wrote an article, a review article with two ear nose and throat doctors and we had it published in the Journal of Clinical Medicine is peer reviewed.

We referenced it with 100 and 60 references joining the dots together because there are some studies on mouth

breathing, showing an increase in sleep apnea severity, there's references in terms of the connection between the diaphragm and the upper airway dilator muscles in the throat.

So we joined dots as much as we could. But two days. Nobody has got a group of patients with established obstructive sleep apnea measure their baseline H. I get them to go through a breathing reeducation program, not just closing them out, not just breathing low, but breathing. Light, breathing slow and breathing low.

Because breathing is not just one dimension. We need to look at all three and then measured or H. I. And if even that was done four weeks later it could be tremendous.

The CPAP machine works. But the problem is 50% of people can't comply with it. So what do they do? Nothing. They may go on Mandibular Advancement device which of course is going to work.

But bringing even breathing in with mandibular advancement device is to help the mandibular advancement devices anatomical maya functional therapy, great therapy as well.

So breathing is one of those components that can be used alongside existing treatments to help to improve success rates. So perhaps there would be a case for doing a sleep study getting an A.

H. I. Baseline doing four weeks or so of breathing exercise during the day plus a walk. So doing some breath holds plus a walk. Maybe also doing a baseline control pause, seeing how that is at the beginning too.

And then after that four weeks maybe every week re calibrating what's the control pause and seeing where that's at and how that's progressing. And at the end of four weeks doing another A. H. I.

And seeing how that's progressed with also the taping at night. And then you mentioned that depending on how much of a lowering there could be a next stage or step of a dental device to help expand the palette and do something jaw wise or structurally. There could be no functional therapy that could be done to exercise the throat and the tongue and all the muscles and get those muscles to where the tongue construction the upper palate and stay in the correct positioning.

And then there may be a case also of course where CPAP works but it has low compliance. So we have those steps and stages to where a person could start with a breathing retraining of breathing reeducation that's simple, easy, affordable for them to do at home.

And then if need be they could add additional mile functional therapy and or a device which would be a bigger investment. But that would potentially help reverse the problem without the need to have an external device like a CPAP continuously doing the thing where it helps. But it's hard for people to actually do it and comply with it. And so um I think this is great for the person who's like okay I've I've listened to this talk I'm convinced I need to do some breathing reeducation. But where do I start?

Well control pause is a great place to start with breathing exercises during the day, potentially some taping at night. And then seeing how that control pause increases. Maybe would be a baseline and then a step up would be add a sleep study at the baseline like a nocturnal oximetry test or something that measures oxygen and heart rate at night. Or even one of the devices that's starting to measure oxygen and heart rate at night. Even an apple watch now will tell you a range of oxygen level at night. And the aura ring has released a version that has oxygen in it. So home devices they're not near where a sleep study is and they're not going to do the same thing as a sleep study.

Resources, apps, and closing remarks

But they can give something for someone who's not ready to do a sleep study or doesn't have accessibility to a sleep study and do that as a baseline and then see the change over four weeks would be sort of the next step up and then the next step up might be adding my functional adding a mandibular device if the A. H. I.

Is still an issue after doing the initial step. So is that a good progression for someone who's watching and thinking

okay how do I start this? What's a good place to start.

I think it would be great. I think getting them out closed is a great start. It's not enough. And as you spoke about breathing from the three dimensions is very important.

It would be really wonderful because it's crying out for research this. I've seen the results over 20 years. You know, the exercise are accessible. We have a simple app called beauty co clinic that's free of charge and all of them, not all of the exits all of the exercise for Children are free. So you're asking about kids earlier on and some of the exercise for adults are there in the app and we were also having a new app coming out in about four weeks, which is everything.

It has 26 different exercise. It's got 100 videos, It's got customized daily plans. So a person goes in the click sleep, they get a daily customized plan for their sleep that changes.

So it keeps them and it gives them rewards and things like that. And you know, psychological feedback, We put $150,000 into the second app and it's going out for free. So my objective because something is held breathing back. My objective is to get half a million people downloading this app because I feel when we get to this tipping point that it will start swaying the importance of breathing.

I need to get breathing changed and how it is taught in yoga studios in Pilates, I would like for people to understand that breathing is not just taking the full deep breath inside the studio that there's more dimensions to breathing.

And it's not just about how you breathe in the studio, it's your everyday breathing pattern. It's with you all the time. The books, I have nine books.

And the reason that I put nine books out there was because back in 2002 and I felt that people didn't really want to listen to me. So I said, well I'm going to write a very simple book.

And the book at the time was called asthma free naturally. And I put it out there and that went worldwide. And then I wrote a book called to close your mouth, simply close your mouth.

And that is still in the top 10 selling 10 Asthma books on Amazon to this day. And I've got six or seven other books most recently is Atomic Focus. And a good book maybe for people who want to know the science behind it and where we're going. It's called the breathing cure.

And the breathing cure has got the 26 different exercises in it. So whether you want to stress the body and mind whether you want to target breathing from different dimensions and all of this then is going into the app.

So, so I think it's very accessible. You know, I'd love to make breathing accessible to the world. And my own schedule is hectic. So I want I want to cut it down a bit as well.

And that was part of the reason. But we have also about, we have about 3000 instructors throughout the world in about 50 countries. And they teach the same techniques and they have the same information and the same knowledge and its breathing is it's, you know, first do no harm first, do no harm. It's inexpensive.

It's accessible and you can dip, you can gently dip your toe into the water. And I would say that to people anyway, you know, if you're a bit hesitant to a breathing, just dip your toe in your body will tell you whether it's right for you, do it a little bit here and a little bit there and start developing into harvest.

There's no side effects. But going for a walk with your mouth closed, it just doesn't make sense. Don't do it with your mouth open will stop. It doesn't make sense to have your mouth open during sleep.

It doesn't make sense for you to be breathing hard and fast and having no attention to your breathing during rest, gently soft and slow down the breath.

And your breathing is really, it's a tremendous, it's a tremendous resource, you know, to help get your attention out of your head because, like, people might say to me while breathing takes effort and breathing takes time.

And I was thinking like, what's the alternative? You know, focusing your attention on the breath. Yes, it does take a bit of time. But what's the alternative? The alternative is that we're drowning and taught the alternative is that we are addicted to thinking.

We can't stop thinking and we are asleep to everything that's going on around us. Like how can we experience life? Because we only experience it through the five senses through our site truer smell, taste, touch, you know, to our hearing.

We experience life through our senses. But if we're living stuck in our head, it is a recipe frank's because the human mind, It's as if education, we have been trained how to think and to analyze and to break information into tiny pieces.

We have been given a tremendous capability of thinking. We spent 16 years learning this. If we've been lucky enough to get through university, we've been taught how to think.

We have not been taught how to stop thinking. It's very important to be able to bring us solace and a quietness and a gap between thoughts and to direct our attention to what we want to direct it upon as opposed to being a slave to the brain, a slave to the mind.

That's wonderful. And even the research from places like Heart Math Institute that are looking at as we know that change in breath changing heart rate variability and coherence.

Are are suggesting also that self love, that the ability to have compassion for yourself for others, to forgive yourself to be able to enjoy life and the life experience you're mentioning, we need to live and this is there's direct research suggesting that when you adjust your breathing, you adjust your mental emotional state and there is more capacity to open your heart, more capacity to tune into and get in touch with what's meaningful, what's fulfilling, what your purpose is, why you're here, how you can serve, how you can support others and to feel contentment and at peace inside.

And people long for this, they want to feel content and at peace inside. But it's almost like spinning the wheel when the physiology is in this angst, there isn't the ability to settle into the heart in the same way of being able to sense into the awe of everything that is and how beautiful this universe is and this life is even through the struggle and the stress and struggle externally is already enough in the world to be able internally to go into the heart and to settle and to be able to consciously adjust the breathing, to relax the nervous response to be able to almost be like that i in the middle of the hurricane that calm in the middle of the the the sense of chaos in life, that person, when you look at that person who seems like everything around them is going haywire and and it's a turbulent life experience the person who is in the concentration camp and at peace. This kind of experience is possible and we know people write about it, people have experienced that and I really want to encourage the audience to understand that breathing maybe one big aspect and access point to that may be a way to begin to train the physiology to tune into that there's a part of you that's untouched by any stress that can deal with challenge and struggle from a place of that piece inside that peaceful contentment inside and finding that ability, that gap between thoughts, the ability to consciously direct thoughts towards what's courageous in your heart that you know, that you want to serve and support the world and I admire you Patrick for your dedication to this teaching, you're fully in on breathing and helping people to understand how this can be a way for people to access this part of themselves that's untouched by the trauma and stressors in life.

So I want to really direct people to whatever it is that they can due to find out more about you because I know they're going to want to to find those next steps.

So you mentioned the breathing cure is a book opportunity and what what else the app with the new app going to be called oxygen advantage, oxygen, there's a book by the same name for people who are interested in sports.

It's quite a popular book and that was published written back in 2015, still relevant today and we also have Youtube youtube challenge where we put up a lot of videos as well and just two different challenges, beauty clinic and the website and there's oxygen advantage and people can do a two hour workshop with me as well.

It's a small group, 20 people attending and it's live by zoom and I guide them through the exercise. I've got one specifically for anxiety and panic disorder, one for sleep apnea and insomnia, snoring and one for asthma and breathing problems is $50 for the two hours.

So it's quite cheap. It's affordable for people, but they also get the recording at the end of it. So after they've done the two hours then they can just play it back themselves.

It's password protected. So yeah, so I think Miles, I am lucky I found a job that I absolutely love doing. I've seen the results with people over the years and it's very rewarding and sometimes our own ailments can be, there are tremendous driving force and experience for directing us towards a certain part.

So I'm 20 years into this and you know, it's really amazing and we're starting to see breathing get out there now and I think it's tremendous. We do need more research.

You know, it's, it's scattered and it's understudied, but at the same time, the doctor, it's starting to happen, you know. So yeah, it's so good. Well, my deepest appreciation for the work that you're doing and the energy you're putting into trying to get research and I look forward to you know, let me know how I can help in any research efforts because I I feel the importance of this utilize it in the clinic and I want to support and help.

And I see how important sleep apnea is. I see how important the basil respiratory rate is. I see how important it is for metabolic function for cardiovascular health, for infections, for mental health for so many aspects of health. It's just and it's so simple and it's so inexpensive and it's so accessible and that's what we need in medicine right now or what can because the chronic disease epidemic right now C. D.

C. In America is the Centers for Disease Control say six in 10 americans have at least one chronic disease, four in 10 have two or more chronic diseases. And this has been on the rise for a long time And the expenses are getting greater and greater and the expenses in the medical world if this doesn't stop are going to bankrupt the economy and it's going to be very bad.

So we need strategies desperately right now. It's urgently. We need strategies for people that are simple that are affordable and that are effective that people can implement easily and simply and it can help to reduce the chronic disease burden.

And I think you're doing that. So I do encourage people. Please do go get the oxygen advantage app. Look at the oxygen advantage website, We take a clinic website. Look at the book, the breath cure and or the oxygen advantage book. These are great resources.

Thank you for putting them out. And it's been an honor. It's been a pleasure. Thanks very much dr miles. So it was great to uh, to have, especially coming from the medical perspective that you're going beyond the traditional realms in medicine. And I think we do need more of this as well.

So that's my, my two points in. So pleasure. Thanks very much. Thanks everyone and have a great day.