Introduction to Sleep Deep Summit

All right, everyone, welcome to the Sleep Deep Summit. New approaches to beating insomnia and sleep apnea. I am super excited about our next speaker. It's Patrick McKeown. He's an author.

He's an international speaker and he's a breathing expert. I want to name the two books that are really meaningful for anyone who is trying to get better, breathing both through their nose and for their health.

He has the oxygen advantage and the breathing cure. Welcome, Patrick McKeown. It's great to see you. It's a pleasure. Dr. Wells, it's great to be here.

Thanks very much. So I'm really excited to talk to you because one of your primary messages to people who are looking for help with breathing is the importance of breathing through the nose.

And I want you to just take it from the ground up. Why is this critical for health. Being called atomically? I.e., the mouth doesn't do anything when it comes to breathing.

You know, it's it's not rocket science. One has to look into your mouth and just ask what parts of the motors devoted in terms of moist thing or regulating the volume or warming the incoming air, filtering the air, the nitric oxide to so many benefits.

Does that stem from nasal breathing?

Why Nasal Breathing Matters

And those same benefits don't apply to my breathing. And even in sleep, we know that from the mouth is open. The tongue is interesting. Up in the roof, the mouth.

So the tongue then is in a lower resting position. It's more likely to encroach the airway. We also know that the lower jaw falls back at hinges downwards and it can narrow the airway as well.

And then mouth breathing is causing drying and cooling of the airway, which in turn has moisture sucked out of the throat, can contribute to inflammation and further narrowing of the airway.

My breathing also activates the upper chest. You know, if we look down at our chest and if we take a breath to the mount, we typically see that when we breach of the mouth, we engage more of the upper chest and we have reduced recruitment of the diaphragm.

And the problem with that, with sleep is that the airway is one airway. So whether we are talking about the nose or the throat, the try to the bronchi, the bronchioles, the diaphragm, it's all one area.

And when we breathe through the nose, we get better recruitment of the diaphragm, which in turn increases lung volume because quite simply, we're using greater area of our lungs and the throat is stiffer and less likely to collapse.

You know, so it's really interesting, the whole relationship between the upper airway, which obstructive sleep apnea would be considered, and that's where most of it is taking place.

But we kind of forget about the lower airway, because if there is a problem in the lower airway, it's going to affect the upper airway. So so, yeah, Dr.

Wells nose breathing, it's absolutely crucial. And we're not just talking about nose, breathing during sleep. We're talking about nose, breathing during wakefulness and during rest and also during physical exercise.

I couldn't agree with you more. And in my line of work, where breathing factors in so fundamentally to not only problems with sleep apnea, but also sort of relaxing the brain and the body into sleep during insomnia treatment.

You know, oftentimes I run up against some resistance from people who characterize themselves as mouth breathers, as if it's part of their identity. I've always been a mouth breather and it seems rather inaccessible for them to change into nasal breathing.

So I wonder if you could give a few tips about how they might start taking those first steps. Well, I suppose, you know, do people feel comfortable breathing through the nose in the first instance?

Because I was a mouth breather for 25 years, and I remember when I first switched from out to nose breathing, you know, during the day, the nose opposes a resistance to your breathing, which is very good in terms of slowing down the breath.

But that same resistance during wakefulness can generate a slight feeling of restlessness. Mm hmm. And sometimes that people feel that sensation of breathlessness, they will unconsciously switch to my breathing to alleviate that feeling of air hunger. But what I would say is absolutely continue breathing through your nose, because the more you use your nose, the better your breathing pattern.

Your breathing improves, but nasal breathing, and you're less likely to be in this fight or flight response. Earlier on today, I was working with a female with obstructive sleep apnea.

And she's not just feeling obstructive sleep apnea. She's also stressed. She's breathing fast and upper chest. She's got cold hands, she got cold feet got brain fog.

She's not productive, you know, and if our quest is to to have good concentration and good memory and good attention span and feeling calm and resilient and being able being able to make the right decisions, I think sleep quality is absolutely vital.

So I suppose there's a couple of things here. One is we need sleep and we need slow wave sleep and we don't need to have sleep fragmentation and disruptions to our sleep.

And it has been well written about over hundreds of years. The importance of nose breathing. You know, there was a book written back in the 1870s called Shut Your Mouth and Save Your Life.

Not a part of the title, I suppose, is the title, but it was written by an American painter called George Caitlin, and he went to live with the North Native American Indian mothers and of course, to the tribes.

Overcoming Mouth Breathing Habits

But his observation was that when the native Indian babies had their mouths open, the Native American mothers went over and gently brought the lips together to help ensure nasal breathing.

And we also know from from our ancestors, by the work of anthropologists, when they unearthed skulls, that our ancestors were innate nasal breathers. And they knew that by the shape of the face and of course, the maxilla, that it was white and it was U-shaped and it was well directed.

The growth of the face was forwards and there was plenty of room in terms of there was no overcrowding of teeth, that there was plenty of room in terms of the teeth to was, you know, in the mouth for for the teeth.

And the one thing about this is when the face grows and develops correctly, there's plenty of room for the tongue. So, you know, I think it's more so the awareness of what you're talking about, the importance of of nasal breathing.

But I have to confess, no health care professional told me in 25 years about breathing through my nose. And I was a chronic mouth breather and I had undiagnosed obstructive sleep apnea. And 50% of the adult population are waking up with a dry mouth in the morning, 50%.

So very few studies on us, but let's even look at the work of Dr. Christian Guilleminault In the latter years of his life, he was talking about the critical importance of restoring nasal breathing, not just during wakefulness and sleep.

This same doctor, he coined the phrase obstructive sleep apnea, which we all use. And he developed a high index. So he's considered to be one of the founding fathers of sleep medicine.

And he's talking about the importance of nose breathing. So I think if this information if there was a greater awareness of it and if people were hearing about it from different directions, then they would really start to get on board.

And nobody should be waking up with a dry mouth in the morning. And that's one short indicator that at least the mouth has been opened and breathe are true for at least part of the nation.

Agree. And it's such a big problem that can not only disrupt sleep, but also just cause discomfort and increase the arousal during sleep. Those brief awakenings that disrupt sleep quality.

So I want people to hear this quite plainly. Mouth breathing in and of itself is a sleep disruptor and can lead to problems with energy and wakefulness during the day.

And I want to circle back to something that you said, too, which is that when we have an open mouth for breathing, our breathing our breaths are rather shallow, sort of in the top of our chest.

And this can exacerbate or drive forward anxiety measures, just sort of feeling anxious, sort of on edge, which is incompatible with sleep and also reduces our feeling of well-being during the day.

So I'd like you to describe more the benefits of sort of taking a diaphragmatic breath and how that's different than that sort of shallow breathing from the mouth.

Yes, we have the vagus nerve, which is interfacing the major organs and 80 to 90% of the communication of the vagus nerve is from the body up to the brain.

So we have all of this bottom up communique. And we need in order to fall asleep, we need to tell the brain that the body is safe, the brain is doing its job, and the brain is here to protect us and to ensure that we survive.

But if we are breathing fast and shallow upper chest, the brain is interpreting that the body is under trash and the brain won't allow us to fall asleep.

So in terms of activating the relaxation response, it's very much in the speed of the exhalation. And even by just breathing in and out of the nose, but by consciously taking a softer breath in through the nose and a really relaxed and a slow and a gentler breath out.

Because when we slow down the speed of the exhalation, we stimulate the vagus nerve. And this, in turn, is secreting a neurotransmitter called Acetylcholine And the heart rate slows down.

The brain interprets that the body is safe. But there's another cluster of neurons, brain cells that are actually spying on our breathing. This was identified in Stanford Medical School in 2017.

So we have parts of the brain, we have this bottom up communication, but we also have this top down observation. And this part of the brain is spying on our breathing.

And if we breathe faster and harder, not only does it trigger anxiety, but it can actually arouses from sleep. So the

speed at which we breathe during sleep also has very has some importance.

And you can imagine, say, somebody with asthma, I was always intrigued. Why do people with asthma have sleep problems so much more than the normal population?

Asthma is characteristic of inflammation of the lower airways. Why also are they sleepy? They tend to breathe faster and harder because of narrowing of the airways.

And they're harder and faster. Breathing is increasing resistance and turbulence, but also they're more likely to be risen from sleep. I think, you know, one very simple way to talk about circling back to your question about my breathing, a nose breathing is to make the sound of a snore through the mouth.

And anybody can do this and it goes like this. And then closure mount and try and snore through your match with your mouth closed. My snoring stopped straight away once we get the mouth closed and then we have nasal snoring.

So that's vendas turbulence inside the nose and forward to nose meets the chosen the nasopharynx.

Diaphragmatic Breathing and Relaxation

But if we were to breathe softly, taking a soft, gentle breath in through the nose, in a relaxed and slow general breath out, we can automatically reduce the turbulence because we're reducing the flow of air.

It's not just about the airway, but it's also about how hard and how fast that we breathe. So coming back to the die from it is very important to breathe with good recruitment of the diaphragm because of the connection between to die from in the mind.

And it the connection is via the phrenic nerve. So when people talk about the mental health condition, such as schizophrenia, we can see the connection there.

The Greeks knew us, but this is coming back then to know is breathing. And sometimes the best observation would be is to look at young infants brains, look at animals, breathe.

Okay, the dog will have its mouth open for periods of time, but next time your dog is nice and comfortable and the dog has no time. The dog has no problem falling asleep, by the way, and the dog doesn't feel guilty about relaxing and resting.

And when you see that the dog has the mouth closed and breathing in the neck through its nose, and you'll see the nice recruitment of to die from that.

They are tending to breathe low. They're not taking these full big breaths. And the belief that it's good to be taking big breaths, they're not purposely bringing more air into their body.

They're just breathing as two way as nature has intended. And I think we need to go back to that. We need to go back to basics. So I use the acronym LSD. Okay.

It mightn't be ideal, but people people get it like Alice for life. We don't want to have turbulence and heavy breathing as this for slow. We just want to have a normal respiratory rate and especially when we want to activate the body's relaxation response and is very deep.

But what I talk about deep, I mean, breathing low, it's not about taking this for big breaths. I really like that. It's such good, common sense, light, slow and deep, really recruiting your diaphragm and you can feel your stomach sort of move outward as we're talking.

You know, what occurs to me is that for people who want to discover the power of this new way of breathing, a

great way to enter is through a practice of mindfulness.

It's really being deliberate about taking some time out during the day to practice this technique and become more comfortable with it, and then using that skill at night, at bedtime in order to relax, communicate that message of safety to the brain and then sort of drift into sleep peacefully like we all want to do.

I totally agree with you. And I suppose when we talk about mindfulness, we're really just taking our attention out of our out of our minds and into the body and onto the breath.

And there's nothing left to filter through about this. You know, education has trained us how to think and to break information into tiny pieces. We have been trained how to think, but we haven't been trained how to stop thinking.

And I'm not talking about the practical thinking that we all need, you know, cognition. We need to be able to plan, organize, make decisions. All of that thinking is pretty useful.

That's good. But it's the rumination, it's the critical thinking. It's the stuff that goes on to our minds, the worries and the anxiety. And the thing about the human mind is that the body doesn't know the difference between a real event and an emergent event.

And if I'm there just before sleep and I would also say to people, don't watch the news, you know, if you want to watch the news, watch it maybe at 1:00 pm today, because the more we are overstimulated prior to sleep and there's a risk of overstimulation because we have so much information going at us.

So instead of giving all of our attention outwards and taking all of this information in and we're not able to process so much information coming, forget about all of the information, bring our attention into our practice and answer the body.

And even for a short period of time, it can be 1 to 2 minutes and observe your breath so you feel the air flow coming into your nose and really just slow down the speed of the air coming into your nose and then have a relaxed and a slow and a gentle breath out.

So when you have that very, very soft and slow, gentle breath in and a really relaxed and a slow and a gentle breath out, you're telling the brain that your body is safe.

And if you do it to the point that you're soft and you're breathing to the point that you feel air hunger, you feel asleep at breathless, which signifies that carbon dioxide has increased just a little in the blood.

But the increase of carbon dioxide can also stimulate the vagus nerve. And as you're doing this, pay attention to the slide in the match when you under breathe.

In other words, when you're gently soft and the speed of your breathing and then have a really relaxed and slow, gentle breath out and you under breathing to the point of air hunger, it can activate the rest and digest response.

And the woman this morning, three, 4 minutes, she was feeling sleepy. And we know we're activating the rest response when we feel sleepy. And that digest responds when we have this increased watery saliva and then we can fall asleep.

But there's another thing to this. Dr. Wells One of the characteristics of obstructive sleep apnea is high looking, and high looking is when breathing is quite unstable during sleep, and that can be recognized by Brett or time if we looked at Messenger's paper.

So I look at is when our breath or time as measured during wakefulness is low the person this morning her breath total time was 12 seconds that would indicate that she has high look at her because of a strong chemo sensitivity to carbon dioxide.

Excuse me. There was a rugby match on Saturday and I was shouting. So it's my voice. My voice Monday morning isn't so good, but I look and can be recognized, as I said, by low breath all the time.

And when we have a stronger sensitivity to the accumulation of carbon dioxide, the problem is that during sleep time we start with no worries. I think this is the season for throat clearing and post nasal drip.

And it certainly is fun. There's a rugby match on and you're, you're, you're shouting and roaring. But yeah. So in terms of, say, somebody with a halo can they have to you'll have to edit all this out.

Sorry. They will have a strong chemo sensitivity to carbon dioxide. So when they stop breathing during sleep, carbon dioxide can't leave the body so quickly because of course, one to stop breathing.

And as carbon dioxide is accumulating, people will look. And when they resume breathing, they resume breathing with such exaggerated ventilation.

Mindfulness, Air Hunger, and Sleep Onset

And now that carbon dioxide has gone from too high, has happened during the stopping of the breath to too low and to a carbon dioxide in the blood. And it's going to slow. The brain doesn't send a signal to breathe.

So it could be essential up there, but also when the brain doesn't send a signal to bridge the output from the brain to the upper airway, dilator muscles is also reduced.

30% of people with obstructive sleep apnea have high, low can. And how do you reduce the chemo sensitivity to carbon dioxide? Because high loop gain is a non anatomical phenotype and one way to help reduce the chemo sensitivity to carbon dioxide is practice breathing lightly under bridge.

Do your physical exercise picture my closed. It's not about doing physical exercise to the point that it's excruciating, but it's about doing physical exercise with your mind closed to the point that you can sustain these live breathing, that you're feeling that sensation of breathlessness.

And the more we do our physical exercise with the mouth closed and the more we gently soft and then slow down our breathing patterns during the day, we have to reduce to chemo sensitivity to carbon dioxide our breath total time during wakefulness increases and now our breathing during sleep is better because as well as we can't just think about the airway without having a flow.

And the other thing about somebody with a strong chemo sensitivity to carbon dioxide, they often feel air hunger and it's the sensation of air hunger which can drive their breathing into the chest.

So now we have another problem that there is a reduction of lung volume. So I think one of the phenotypes, aside from anatomical compromise, a very important characteristic of sleep apnea to help address is how I look and the breathing exercise that we just did there a little a little while ago, just as the person sitting down, it will it will offer us two potentials.

One is to activate the rest and digest response. But number two, in the long term, it's helping to reduce cytokine. So the last ten, 15 minutes at night, you're sitting in a nice, comfortable environment.

You're not being exposed to overstimulation. Maybe to have blue light touch your glasses on and you're just sitting there and you're feeling really comfortable.

And for the 15 minutes, you're telling your brain that your body is safe, but also you're bringing your attention out of your mind and onto your breath during that time.

It's almost as if you're taking a holiday from the from the mind that you're reducing the rumination and the excessive thinking habit of the brain. And there's something also very important.

We're training our brain how to hold attention, because very often we're so stuck in our minds and it's almost that we are frazzled. You know, we don't have the ability to endure and wait for us to be holding our attention. So with this you're happy, interactive it the relaxation response.

You're helping to improve your concentration and attention span. You're helping to reduce to chemo sensitivity to carbon dioxide. How much reduced chemo sensitivity to carbon dioxide.

Your breathing is naturally lighter and slower, which in turn is helping to reduce the turbulence and the negative pressure created during inspiration.

So I think there's a lot going on for such a simple exercise. So, yes, this does boil down to what you talked about at the start. Nosebleed, tongue resting up on the roof, the mount, and just gently softening and slowing down or breathing.

I love it. There's so much good common sense here and I want to circle back to a little bit of what you said with people who have high blood gain and just reinforce this idea that it interferes with breathing and it interferes with sleep.

I see this on sleep studies all the time. People will have a central apnea at sleep onset and then in over breathing and then an arousal from sleep. And this is especially true for women.

And I'm always trying to help move along, sleep for women who perceive that they sort of skate on the surface of sleep, partially because of this breathing instability that's present with the central sleep apnea as at sleep onset.

But what you're talking about is so powerful because it helps us be aware that all of this can be under our conscious control. In other words, we can do something about it.

We can practice, get better at breathing and solve the sleep problem naturally. Thank you so much for that. You're very welcome. It's a pleasure. You know, in terms of the phenotypes, this really has opened a door in the recognition that obstructive sleep apnea isn't just anatomical, but that you have three non anatomical interventions.

And 70% of people have at least one or more of these non anatomical phenotypes. And that's where breathing can play a role because we can influence all four of the phenotypes.

Getting the mouth closed with the tongue resting up in the roof of the mouth helps to reduce high peak because we can help open up the airway. Improving breathing patterns during wakefulness.

Breathing knows light, slow and deep will also help to reduce high pre-crash arousal threshold, which is very layman's terms, will be insomnia. Being a light sleeper.

If we breathe through our nose, we typically have deeper sleep. And also if we have lighter and slower breathing during sleep, we're less likely to be aroused.

So we have deeper sleep and we can stay more in slow wave sleep. And then as look and as we spoke about and and then as for muscle recruitment so there is a connection by breathing through the nose we harness nasal nitric oxide and it's thought that nitric oxide is in there too in messenger, that it has some communication to the upper airway to later muscles.

But also we spoke about carbon dioxide. If we are hyperventilating during our sleep, breathing hard and breathing fast and we're blowing off too much carbon dioxide from the blood through the lungs, the brain doesn't send a signal to the upper airway to later muscles.

So I think breathing reeducation. But my functional therapy would be a tremendous adjunct. And even when we look at people using a CPAP, the compliance with CPAP is reduced with mouth breathing versus nose breathing is very understudied.

But in 2004, there was a study and it showed that at 12 months, individuals who were breathing through their nose, 70% of them are compliant. But individuals who are breathing through their mouth during sleep only 30% of them are compliant.

So we do need to look at breathing our everyday breathing. Yes. And the study that you that you referenced was sort of a landmark for people who were recommending CPAP.

High Loop Gain and Sleep Apnea Phenotypes

And I think one of the problems is that when a person is picking out a CPAP mask, one of the very first questions they're asked is, can you breathe through your nose during sleep?

And if there's any question about whether that's true, they're automatically given a full face mask or an oral nasal mask. And the the root problem isn't really solved.

I wonder, Patrick, if you can maybe give some techniques or some insight as to how a person who experiences nasal congestion, either just at night when they lay down or even intermittently during the day, how they might maneuver to solve that so that they can start breathing better through their nose.

To nose is the organ that the more we use it, the better it works. We're not going to expect to be able to breathe through our nose during the day if we spend half or more of the time or any amount of time with our motor open during the day.

So we really need to think about how are we breathing during wakefulness? Go for a walk with your mouth close to your yoga, breathing in an air through your nose, gear, gardening and anything that you're doing, especially involving physical exercise.

Because the way I look at it is if you can breathe through your nose during gentle or physical exercise, you'll have no problem breathing through your nose during rest.

Now, to decongest the nose, there's three ways to do it. One is by doing physical exercise, which are my clothes, that naturally helps to decongest the nose.

The second is to do breath tolling, and the third is when humans have sex. So one way then to decongest the nose by doing breath holding as you take a normal breath in through your nose and that through your nose and you hold your nose and you just gently nod your head up and down and even doing it about ten times.

And by doing that ten times to a nodding your head up and down, ten times on a librettos, it's very light. Most people will tolerate it pretty easily and then let go of a pretend through your nose and then wait maybe a half minute and rapacious.

So to do it again, you take a normal breath in through your nose and out through your nose. You pinch your nose and hold your nose to stop breathing and then you just gently nod your head up and down and you could do tennent's.

And then you let go and you breathe in through your nose and you'll start to feel that your nose is opening up. We've we have been using tape on the mouth now, and I'll explain go a little bit more detail.

I started doing this in 1998 because it was one way for me to have, you know, in terms of waking up feeling refreshed. Now, at the time I had a lot of nasal congestion.

I have a deviated septum as well. Even though I had an operation on my nose in 1994. But the thing about the operation was it didn't change my behavior.

So even though the surgeon actually worked and I treated my nose, I kept my breathing afterwards. And I read the

newspaper article then about the importance of nose breathing.

So I got pre write strips based on the costal maneuver just to gently open up my nose and then I use medical tape. The thing about taping is, even though it can help a lot of people, one third of people with obstructive sleep apnea, especially moderate to severe, can have a worsening with their HIV if they take them out.

And the reason being is that this is from mouth tape is put right across the lip because it prevents mouth puffing. So the individual needs to be able to mop off.

Now, it was by chance like we developed our own tape a few years ago and it surrounds the mouth to bring the lips together. It's an elastic tension, but it doesn't actually cover the lips.

So the individual can make puff. And I was trying to figure out like, what is my puffing? And we all know it, you know? So I got onto my treadmill and I was doing those breathing on the treadmill and I kept on ramping up to speed until I couldn't sustain nasal breathing because the air hunger was too much.

And when you can sustain nasal breathing at a certain point, you automatically mouth off. So obviously that's what's happening as well. A combination of the flow and detectors which people are breathing.

And of course, when you combine resistance to breathing and stopping of the breath during sleep that the individual has to be able to, to my tough and if they're taped right across to lips, it's not ideal.

It will make their sleep apnea worse. So what would I say to people with sleep apnea? I would say do the things that you've been talking about nose breathing at all times, it's absolutely vital.

Your mouth is simply not for breathing. Your children will notice. You know, you ask a five year old, what's your father say? It's for saying, what are your ears farts for listening?

What is your mouth for? It's for eating, for drinking and for speaking. And what's your nose first? For smelling and breathing. So it just the obvious things, you know, we have overlooked, but also practice gently softening and slowing down the breaths.

And that's really crucial, especially ten or 15 minutes before sleep, but even during the day to do that. And it's so wonderful to be able to bring your attention out of your mind and onto your breathing and to tell your body for your body to tell your brain that you are safe.

And another benefit to this is that the more you have your attention, that little pocket stroke today and you bring your attention on to the breath, you have to bring a quietness and the stillness to the mind.

And that will improve your concentration, your ability then to hold your attention on whatever task you want. We're happier because we're not as happy as individuals.

Humans are not happy when we worry a lot. That makes sense. So how then do we reduce the worrying mind? Well, that's bringing our attention out of the mind and onto the road.

But there's also another aspect to this.

Improving Nasal Breathing and Practical Tools

If we have a habit of operating, we are breathing faster, we are breathing harder, and we can be hyperventilating chronically. Now, I'm not saying that everybody breathing control disorders hyperventilate, but chronic hyperventilation can happen when our breathing is just a little bit too fast and too hard.

And there's a pirate paradigm that came from a psychiatrist, Dr. Michael Bender, and he spoke about neuronal excitability. We have a billion brain cells, and each brain cell is communicating with 15,000 other brain cells.

And the signal coming from each brain cell must be strong enough to reach other brain cells. But of course, the brain cell, the brain cell itself, which is receiving the signal, must be able to cope with the signal that's coming in.

But if we are breathing hard and fast, it lowers carbon dioxide, it increases blood, and this increases neuronal excitability. And that's another aspect of it, because when the mind is agitated, we can't sleep.

But also when we cannot sleep, when we have poor sleep crazy, the mind is agitated. And I often feel, Dr. Wells, that this is something that's forgotten about.

There are so many people with depression that have undiagnosed obstructive sleep apnea, and nobody seems to talk about not so many people, at least in my own observations, clients with depression, they're going to their psychiatrist to go to their medical doctor, they go to their psychologist.

Very often, sleep quality is forgotten about. You can not just address depression from a pharmacological point of view if that same person is having obstructive sleep up there.

Now, I know I know that the symptoms are common, you know, feeling irritable and poor concentration and fatigue. Those symptoms are common in both obstructive sleep apnea and depression.

And probably that's why it kind of gets watered down a little bit. But I think at the same time, we cannot properly address mental health issues unless we look at breathing, we look at sleep and our everyday breathing pattern is very important because it's how we breathe during wakefulness that is going to influence how we breathe during sleep.

And if we make a concerted effort of breathing through the nose and where possible during the day, just gently softening our breathing to the point of a tolerable air hunger and also breathing low.

And that can be simply just having your hands either side of your lower ribs. And as you breathe in that, you feel your ribs gently moving out. And as you breathe out, that you feel your ribs gently moving in because of the connection between the diaphragm and the upper airway dilator muscles.

So, yeah, I don't think we can avoid breathing and functional breathing. You know, there's so much good information here. I want to take a stab at summarizing the highlights of what we talked about for everybody.

First off, I want to say that breathing is a great way to help the mind body connection, which is so crucial not just to getting to sleep when you want to, but also staying asleep and having good well-being and alertness during the day.

You've given us some really accessible techniques to kind of improve our nasal breathing, eliminate congestion, and also do what I like to call a U-turn. Why?

Oh, U turn at night to kind of go inside and be mindful about what you're experiencing. Take control of how you're breathing, and to really start to relax and shed the stressors of the day.

Your tip for low, slow and deep LSD was great. So it's not only the breath rate, but it's also the flow and the depth at which we breathe. All of this is really central to achieving the type of breathing that's going to help you stay healthy.

Thank you so much, Patrick McKeown. I think that we really learned a lot and I wonder as we wrap up, can you tell people how they may might learn more about you or might work with you?

Sure, of course. You mentioned a couple of books. I've got ten books. And most recent one is Breathing for Yoga. And there's also The Breathing Cure. I think that tape may be something that you're your listeners may be interested in.

It's called MyoTape Myo stands for muscle and it's gently. It's elasticated tape that surrounds the lips to bring the lips together. So in terms of mouth puffing, it allows my puffing and it's fairly inexpensive.

It's $25 for a three month supply, and it can be used for the CPAP machine, for example. And we have a resource, we have a free up oxygen advantage and it contains everything in terms of breathing exercises and it's everything inside and it's just free.

So there's no subscription. So if anybody wanted to program a daily program for sleep issues and for sleep apnea, it's all in the app. So that may be another hub for resource for people.

I love that that's so helpful to have these resources that people can access today and really start the path to good nasal breathing. Thank you so much, Patrick McKeown.

It's been a pleasure. Thank you very much, Dr. Wells