Academy of PHYSICAL MEDICINE

Breathing, Pain and Covid-19

with Rosalba Courtney

10th August 2020

TRANSCRIPT

Please note, this is not a verbatim transcript:

- *Some elements (repetition or time-sensitive material for example) may have been removed*
- *In some cases, related material may have been grouped out of chronological sequence.*
- *The text may have been altered slightly for clarity.*
- *Capitalisation and punctuation may be erratic…*
- *There may be errors in transcription. If something appears odd, please refer to the recording itself (and let us know, so that we can correct the text!)*

Steven Bruce
Today we're going to be talking about breathing. Breathing, of course is a topic we have covered on a number of occasions before but we are joined by a real expert today Rosalba Courtney, a very, very experienced osteopath in Australia joining us by the magic of Zoom late in the evening for her but we're very grateful for her staying up to join us. She's not only an osteopath, she has a PhD in breathing. And I learned from her website that she's one of the first Buteyko practitioners to train outside Russia. Rosalba, it's lovely to have you with us. Thank you for joining us such a late hour.

Rosalba Courtney
Yes.

Steven Bruce
I've always- I always wonder whether I'm pronouncing that correctly. Buteyko, is that is that how it's meant to be pronounced?

Rosalba Courtney
Oh, well, Buteyko, I think

Steven Bruce
Buteyko?

Rosalba Courtney
Buteyko, yeah.

Steven Bruce
Is this a Russian word?

Rosalba Courtney
Well that's his surname. So his name is Constantine Pavlovich Buteyko. So he's Ukrainian. He was Ukrainian. He passed away a few years ago.

Steven Bruce
Right. Okay. Well, I mean, we said that we're going to talk about breathing in the context of pain relief and of COVID-19 and of course part of your country at the moment is desperately wrapped up in a second wave of COVID-19 and Coronavirus problems. Perhaps you'd like to set a scale, I mean, what's the context? What's the connection between breathing and pain relief and Coronavirus?

Rosalba Courtney
And Coronavirus? Oh well, kind of separate things, I suppose but with Coronavirus I guess you know, I mean breathing is really on the map now because of Coronavirus, people are suddenly very focused on breathing. When people- do you know, in myself and my colleagues haven't actually been seeing a lot of

COVID patients, I mean, I've gotten very involved in looking at the research on COVID and how it affects the respiratory system and how you can use breathing to prevent COVID. I want to be responsible with what I'm saying here, but certain things can be done to assist the immune system, the innate immune response. And I haven't actually treated a lot of COVID patients. I've had one actually. And but I'm ready for it. I'm ready when they come. If they come, I hope they don't. I hope the second wave kind of dies away and we're all okay.

Steven Bruce
What's the situation then? You've seen somebody who actually has been confirmed as having COVID-19.

Rosalba Courtney
Yeah, someone who had COVID and recovered, so-

Steven Bruce
Oh so, beyond the contagious period, clearly, yeah.

Rosalba Courtney
Well, do you know, I did my consultation via Zoom. So, what I was, so I, I spent maybe two months only seeing patients on Zoom and because I do a lot of work with breathing, I was able to actually see patients and do my breathing work, and do sort of modify my evaluations and do them online. And then do my breathing retraining stuff online. So yeah, that's what I did with this particular person, but also-

Steven Bruce
I imagine that out in Australia, I mean, you've got the same sort of constraints on your advertising or similar constraints on your advertising or whatever you can see on your website as we have here. What's currently permissible in Australia in terms of how you can offer help to people who have contracted COVID-19?

Rosalba Courtney
Well I just say that I don't claim to treat COVID-19 but I was running kind of twice a week breathing classes, and I just called it breathing in the time of COVID. So, improving breathing in the time of COVID. That was about improving breathing habits, and specifically about teaching people how to do nasal breathing. And I was doing classes teaching people humming, which is a way of concentrating nitric oxide. You know, increasing it 14 to 17 times. So I was doing twice a week, telling people about nasal breathing and how to improve the function of their nose. And then we were doing this little breathing routine that I developed and put together that specifically was designed to concentrate or trap nitric oxide, and then breathe it into the lungs. And then I also had breathing classes, just teaching people about managing stress and relaxing and learning how to deal with the nervous system and bring balance back into the nervous system with the breath. And I think that, I mean, I feel quite strongly that we shouldn't overclaim what we can do. And I haven't really looked too carefully at what the health department will allow me or not allow me to do because I feel quite strongly that, people should really follow the advice of experts. And this is a disease that we're still finding out about. And I'm really grateful for the experts working it all out. And I just-

Steven Bruce
But it would be a shame, wouldn't it, if people like yourself who have got expertise in breathing techniques and are basing this on research that's been carried out by groups, which, perhaps you'll elaborate on which groups those are in a moment, but if you've got this expertise, if you're not allowed to tell people, you've got something you can do that can help them.

Rosalba Courtney
Oh, I don't- I'm not allowed to tell people. I just say it carefully. Like, for example, with the nitric oxide stories, you want me to talk about that a little bit?

Steven Bruce
Yes, please.

Rosalba Courtney
So with nitric oxide, what I know is, there are 150 hospitals in America that are using nitric oxide, as a therapy for treating patients with moderate and severe COVID. So, and they're also using nitric oxide gas and giving it to health workers before and after their shifts as a way of preventing nitric oxide. So, looking at the physiology of nitric oxide, and looking at previous research on the previous SARS coronavirus, the one in 2003. What we know is that the nitric oxide actually, well, we know that nitric oxide kills most viruses, it's antiviral, it inhibits viral replication by inhibiting certain proteins needed in the replication cycle. And it's produced in the para nasal sinuses. So, you can actually get like, three parts per million by using techniques like humming and breath holding and so on. So, the stuff that they're using in the hospitals is many times stronger than that. But the thing about humming is that you can do it many times a day when you're at home when you're not super severe. And I don't know for sure that it helps. And I tell people, I don't know for sure that this helps, but it seems reasonable. There's a rationale for doing it. So-

Steven Bruce
But also say if, if it's being done in the conventional medical world, and they're doing it specifically to combat COVID-19, then actually, it's perfectly reasonable to say to people, you can do this for yourself to a certain degree.

Rosalba Courtney
So it's a much lower dosage and it hasn't been proved that it's going to help you get through COVID but do you know what? It's something you can do. And we do know that breathing through your nose increases oxygen levels, something like from 10 to 20% increase in oxygen because of the effect that nitric oxide has on the oxygen uptake in the lungs because it actually dilates blood vessels in the lungs.

Steven Bruce
Well that kind of puzzles me because, and you've got massive expertise in this, hopefully you can put me out of my confused misery here: When we start to alter the balance, the percentages of the gases in our inhaled

air, surely that can have negative consequences as well. Now, I don't know if there are any negative consequences to increasing the nitric oxide but if you increase the partial pressure or the ratio of oxygen, doesn't that suppress the breathing response? Because it's carbon dioxide the promises to breathe, is it not?

Rosalba Courtney
Yeah, it's carbon dioxide that prompts us to breathe. So if you over breathe and blow off too much carbon dioxide, then yeah, you can throw your whole breathing chemistry out of whack and, and disrupt breathing homeostasis. But with nitric oxide, just breathing nasally and using techniques like humming and breath holding, you can increase nitric oxide but not in some way that disrupts physiology. It's still going to be within the realms of normal.

Steven Bruce
Yeah.

Rosalba Courtney
And so- yeah, it's not a disruptive thing, it's within the normal realm of homeostatic function.

Steven Bruce
And you said that nitric oxide actually kills viruses or suppresses their ability to replicate, does it have any, does it have any potentially adverse consequences on other natural physiological functions?

Rosalba Courtney
For sure. So nitric oxide is really one of those chemicals that is, produced by the body in response to different processes. You know, it's an incredibly complex molecule, it's actually got like 2000 different functions in the body. And depending on the dosage, it can be helpful, particularly within the immune, the innate immune response, although it acts within, yeah, sorry, mostly in the innate immune response. And it also has an anti-inflammatory effect on the body and it's also a signaling molecule that helps lots of other systems function. So it's involved in many different systems of the body. So it has effects on vasculature but it's also a neurotransmitter that modulates memory and learning. And it's a bronchodilator and it affects motility in the gut and so on. So there's all this great positive stuff with nitric oxide, but then you've got certain disease and in ageing nitric oxide tends to go down and it's one of the causes of hypertension and cardiovascular disease and so on. But the body can overproduce nitric oxide in certain situations, like in certain inflammatory diseases like rheumatoid arthritis or some autoimmune diseases and so on. Or if there's a kind of out of control immune response, you can end up with high levels of nitric oxide. And so nitric oxide then becomes a, it produces a potent, it combines with oxygen and produces a potent free radical called peroxy nitrite and peroxy nitrite is quite damaging, it's cytotoxic. So at very high levels nitric oxide is problematic in the body. But the interesting thing is there's this whole homeostasis that goes on. So, if you do something like nasal breathing and humming, you ramp up nitric oxide, but that can actually come in and lower, excessive nitric oxide responses that are going on in inflammatory situations in the body. So, it's just this fascinating thing.

Steven Bruce
But you've also said that by those processes, you're not raising the level of nitric oxide by anything like the amount that would be done, say, in hospital where people are being given it in gas form.

Rosalba Courtney
That's right. Where they're given it in gas form. Exactly.

Steven Bruce
We have actually had a question, Iqbal has sent in a question saying "Could you elaborate on humming therapy and nasal breathing?", which I imagine you were going to do anyway. But-

Rosalba Courtney
We can do that, yeah. So nasal breathing, basically nasal breathing is something that, the more you breathe through your nose, the better your nose works. So just encouraging people to undertake sort of basic nasal hygiene, like blowing their nose and using nasal lavage and so on a couple of times a day and then actually beginning to encourage them to breathe through their nose. So, if you breathe through your nose, the nose starts working better. And people who haven't breathed through their nose for a while they can develop something called nasal disuse syndrome, where the actual mucosa kind of deteriorates and you-

Steven Bruce
Can they recover?

Rosalba Courtney
With nasal disuse syndrome? Well, people get locked into it really. People who are mouth breathers often don't know that they can breathe through their nose.

Steven Bruce
But can the mucosa recover if they start breathing correctly?

Rosalba Courtney
Yeah, it improves, the health of the mucosa improves. Yeah. So it can in some situations, I mean, it's complex. There are so many causes of people not being able to breathe through their nose, some of them just anatomical, where you might have incredibly small nasal angle, you might have deviated septum, you might have huge polyps, and that kind of stuff. But often when you get people breathing through their nose, you're surprised that even people with narrow small little noses, if you do proper nasal rehabilitation, you can get the nose working again. Part of it involves actually training nasalis to be able to open the nose and just getting them to breathe through the nose and relax. Relax their whole breathing system because the nose is connected to the rest of the body. So, people who've been breathing through their mouth who have been obstructed through the nose, often when they breathe, they will breathe with excessive effort. And they'll have a whole different breathing pattern, they'll tend to breathe vertically and thoracically and, into the shoulders and clavicle, so on and so on. And so when they breathe in, they tend to narrow everything.

So training, nasal breathing is about training, the whole breathing system, training people to breathe in and widen and breathe in and widen in the body as well. So that's that part of it. And it's actually a long story. I've got a whole kind of nasal breathing protocol that I'm actually researching at the moment.

Steven Bruce
How would people access, where would they get more information on how to improve their ability to breathe correctly? I mean, you talked about widening the nasal passages, is that something simple?

Rosalba Courtney
Yeah, look, no, I actually do courses for practitioners. I've got a one day course, which I call integrative breathing therapy with nasal and upper airway focus where-

Steven Bruce
I'm hoping that's online, Rosalba.

Rosalba Courtney
Yeah, I think it's online. Yep. I mean, yes, yes. I know what you're saying. Yes. Okay. Sorry. I, yeah, I just took the last one online. And I'm teaching another one online in November. So yes. Okay. Everything's going online now for sure. So that's the nasal breathing story. And it's incredibly fascinating. The nose is just a fascinating organ. It's got so many functions, it's got like 30 different functions, and it connects directly to the brain. And it influences the balance of the whole breathing system. But the humming thing, which the question was about, the humming techniques that I use, are just like really simple. Just breathing in through your nose and then I'm just keep it going, making it very meditational. And then there are other variations you like just humming through one nostril at a time. breathing in through one side out through the other five breaths, one side and then change sides, five breaths, the other.

Steven Bruce
How does that work? How does the humming actually increase nitric oxide?

Rosalba Courtney
Nitric oxide? Look, I think just as a kind of a mechanical stress, because nitric oxide is produced in para nasal sinuses, and then it makes its way down into the nasal cavity through the little canaliculi and when people are very blocked off and they just have low nitric oxide. So, this is one of the vicious cycles that happens with nasal disuse syndrome, where people actually have low nitric oxide because they're blocked. So when you do the humming, and when you combine it with breath holding, you can actually get a little sympathetic nervous system effect that creates a bit of constriction in the mucosa and then you get the nitric oxide actually coming down and it can do its job of managing the microclimate in the nose, what you might call the microbiome of the nose, yeah.

Steven Bruce
We've had another question about nitric oxide from Gaminda and Gaminda says "Are there any signs of nitric oxide toxicity or can it be measured?"

Rosalba Courtney
Sure, you can measure nitric oxide. People measure, in respiratory laboratories they'll often measure nitric oxide, exhaled nitric oxide, and people with chronic asthma will have high nitric oxide. Let me tell you something interesting about that though: People with asthma have a lower incidence of complications from COVID and one of the theories about that is that the endogenous nitric oxide that's produced in their body is actually somehow turning off the cytokine storms. You know, the runaway inflammatory response that you get in COVID, because of this sort of regulatory effect that nitric oxide has.

Steven Bruce
And why does asthma produce more nitric oxide?

Rosalba Courtney
Because of the inflammation. Because it's an inflammatory condition.

Steven Bruce
Oh, I see. So, it's a response to the inflammation, it's not the breathing itself which is doing it, yeah.

Rosalba Courtney
It's not the breathing itself that's doing it. It seems like nitric oxide is part of the body's immune response and it's part of the inflammatory response is production of nitric oxide.

Steven Bruce
So, this question was actually about if somebody is doing breathing exercises, whether it's nasal breathing or humming, would there be any signs that they might recognize, symptoms they might recognize, or others might, that they'd overdone it?

Rosalba Courtney
There's not because there's no toxic effect from just breathing through your nose. So, yeah, you don't need to even worry about it. You know, it's like some people will have conditions where they've got runaway inflammation in their body and those, and it'll be not because of nitric oxide because of some other cause. And the nitric oxide is high as a response, as part of the body's inflammation response.

Steven Bruce
Do you happen to know whether the incidence of COVID-19 is lower in other people with different inflammatory conditions? I'm thinking, say rheumatoid arthritis or-

Rosalba Courtney
No, no, it's just asthma. It's just been noted in asthma. The Chinese noticed it and then the same thing was noticed in New York, where it's like, I forget the statistics exactly now, but it was just way lower than the proportion of the population that had asthma didn't match with the proportion of the population with asthma that was showing up in hospitals with COVID. So that's what they reported in China way back in January or something. And then in New York, they recorded the same thing. Yeah.

Steven Bruce
I mentioned to you earlier that we had a question that came in very early, before we went live, from Tim. Tim's asked about whether in the studies about breathing is the position of the person important, in other words standing, sitting or lying, and have you found a correlation between the quality of an individual's posture and the quality of their breathing mechanics?

Rosalba Courtney
Oh, absolutely. You know, there's a lot to that, like, I mean breathing changes with posture. There are natural and functional changes to breathing in relationship to posture, like for example, if someone's breathing, you know, with breathing so if you're looking at breathing pattern, there are two types of breathing patterns. One is called the relaxed configuration and the other is the active configuration. And the relaxed configuration is basically lower ribcage, abdomen dominant movement and the active configuration of breathing is where the breathing is more vertical and it's moving, upwards to and you're seeing activity in the vertical direction. And some people think, oh, well, that relaxed configuration is good breathing, that's functional breathing, and the active configuration is dysfunctional or wrong. But posture changes that. So if someone's lying down on their back they will tend to be breathing with their belly going up and down. When people are standing upright, then the breathing tends to become more vertical. And someone who's got a good healthy breathing pattern, the breathing is kind of balanced and they'll breathe appropriately but someone who's dysfunctional, they will tend to move too much towards the vertical breathing pattern. And so, people with chronic dyspnea who have been chronically breathless from COVID or asthma or COPD, often they're making more effort to breathe, because they've had to breathe against some kind of resistance or there's some inefficiency in the actual structures that breathe in their lungs. So they'll tend to use excess effort to breathe. So they'll tend to over recruit that active configuration of breathing. And sometimes when you're working with treating someone with dyspnea, what you have to do is actually relax breathing muscles, so you have to get them out of this short hypertonic pattern of breathing and actually get breathing muscles to relax. And the other thing is that people who have had something like, say, your COVID patient who's been very, very breathless, you know, they've been hypoxic, and they've been really struggling to breathe, they're often going to show that struggle to breathe in their body. So when you get your hands on them, what you find is that their ribcage feels hyperinflated, their ribcage will feel rigid and you think, oh wow, I just need to loosen this ribcage up. But often, it's like what you're seeing is hyperinflated lungs and so you really do need to work to reduce the volume of air in the lungs. And it helps to use breathing as well as menu therapy techniques to reset the length of the breathing muscles.

Steven Bruce
We've had a question from Alessandro, sorry, Alexandra, I beg your pardon, who's asked whether you know of any negative effects on us when we're wearing surgical masks so many hours of the day? That's been a very popular question on social media and elsewhere through the last few months.

Rosalba Courtney
Well, I've been measuring it with my patients because I do capnometry and oximetry as part of my evaluation and a lot of my colleagues have similar, you know, people in the breathing world have similar equipment. So we've all been measuring patients and we can tell you: No, masks do not drop oxygen, they do not raise CO2. And that discomfort that people are getting when they put a mask on, it's just about the difference in airflow. I mean, you know how when you close all the windows and the air feels stuffy. There isn't necessarily less oxygen or more carbon dioxide, like the composition of the gases hasn't changed. But when there's no movement of air that can feel like stuffiness. So I think it's more a stuffiness issue. And with a number of my patients I've actually had to, because in Victoria you can't wear, you can't go outdoors without wearing a mask. And so, and I'm insisting that people wear a mask in my practice and I wear a mask when I'm in clinic. And people, some of my patients because they have breathing issues, difficulties they get a little bit like "I can't wear a mask!" and I say "No, yes, you can just sit down. Let's look at this." So I measure their oxygen. You know, I put a shield on I say, "Okay, let's look at your breathing with the mask off." And I say "Okay, there's your oxygen, there's your carbon dioxide. Okay, let's put the mask on. Okay, so how do you feel?" and they go, "I feel a little short of breath", and I say "Okay, just relax, slow your breathing down, breathe a little softly. Let's look at your oxygen. How's it looking?" and they go, "It's fine." I say, "Well, it hasn't dropped at all." And they go, "Okay." "What about your carbon dioxide? Hasn't gone up." And then they're sort of reassured.

Steven Bruce
I think social media is responsible for an awful lot of unnecessary worry, isn't it? And I believe that there were a number of surgical consultants who produced their own little post on Facebook or wherever saying "Look we wear these bloody things all day long, and it doesn't affect our blood cast composition." And so people should be reassured. It's almost a claustrophobic effect rather than anything else.

Rosalba Courtney
You're right there, Steven. It's a kind of a claustrophobic effect. It's a bit of a psychophysiological effect.

Steven Bruce
Claire has said- I'm not sure which Claire- Claire has said this information about asthma is amazing. Did you know that China reported very few smokers get the virus and that cigarettes contain higher amounts of nitric oxide than hospitals would normally prescribe? Somebody mentioned this on a previous broadcast, and I'm not convinced that it's a good reason to take up smoking. But what are your thoughts on that?

Rosalba Courtney
It doesn't sound true anyway. I don't believe that about smoking.

Steven Bruce
I've certainly heard it before. But of course, these rumors-

Rosalba Courtney
It doesn't make sense. No, it just doesn't make sense to me. Smoking doesn't produce nitric oxide. I mean, smoking doesn't it give you some carbon monoxide? I mean, carbon monoxide, nitric oxide, they're kind of similar. Both of them are produced by the body in response to inflammation. There's actually some tools out there that carbon monoxide might actually be a little bit helpful too as an antiviral. We've always thought of carbon monoxide as just being this terrible poison. And I remember reading a paper a few months ago about carbon monoxide actually having some kind of natural effects in the body to do with immune regulation and regulation of inflammation. And so I think that the smoke, I don't know anything about smoking and nitric oxide I never thought there was any kind of link but carbon monoxide I know there's a link there with smoking so I think-

Steven Bruce
Iqbal's come in with another question which, I really like this one because, Iqbal says is there a way of affecting snoring with the nasal or humming technique? And it occurs to me that if humming increases nitric oxide then surely snoring must do as well.

Rosalba Courtney
No, snoring doesn't raise nitric oxide.

Steven Bruce
Damn, I thought I was going to have an excuse for snoring.

Rosalba Courtney
I tell you what, though, nasal breathing greatly, greatly reduces nitric oxide. Sorry, what am I saying!? Snoring! Nasal breathing greatly, greatly reduces snoring. Nasal-

Steven Bruce
Doing nasal breathing exercises during the day will affect it, because obviously you have no control over whether you're breathing through your nose or your mouth at night.

Rosalba Courtney
No, you have to learn to breathe through your nose at night. And if you breathe through your nose at night, you can go from a snorer to a non-snorer. You know, there are research studies showing, they did some studies where they got healthy young men and they plugged up their nose. And they found that they developed snoring and sleep apnea. Right? And when they allowed them to breathe nasally again the snoring and sleep apnea went away. They went from an AHI of 28 to an AHI of, like, 1, you know, completely normal because normal is below 4.

Steven Bruce
AHI?

Rosalba Courtney
Apnea hypopnea index, which is the index of how often you stop breathing at night for more than 10 seconds and your oxygen drops below 94, I think.

Steven Bruce
I'm not sure about the ethics of stuffing people's noses up when they're trying to sleep actually and I'm not surprised that they snore. I've got another question here, let me just, Lucy has asked a question. She says she's helping her husband by taping up his mouth at night. Sorry, she says is she helping her husband by taping up his mouth at night to prevent mouth breathing? He says he's sleeping better but is there any contraindication she should be aware of? Steven, we've already mentioned that killing him might be an undesired side effect.

Rosalba Courtney
Well, a lot of people tape their mouths at night.

Steven Bruce
Do they really?

Rosalba Courtney
So that they can breathe nasally and stop snoring.

Steven Bruce
How interesting.

Rosalba Courtney
It's a trend. And if you go on the internet and you look for mouth tape, you'll see lots and lots and lots of different mouth tape and you'll see sleep tapes and sleepy strips but the cheapest easiest thing is just micropore tape. I don't actually get my patients taping their mouths straightaway. I usually do some work with their breathing and I rehabilitate nasal function in the day. And then gradually we get towards mouth taping sometimes.

Steven Bruce
Well in terms of the danger of mouth taping, I'm kind of assuming that if a person struggles to breathe, let's say their nose gets blocked during the night, they will wake up and want to do something about it. So it's not as though it's going to kill them without them be able to do anything about it. Does the mouth taping actually, does that improve their nasal breathing? And that sounds like a stupid question, but as a last resort, rather than normal nasal breathing techniques.

Rosalba Courtney
Yep, yep. If you tape the mouth at night. The thing is, if you're breathing through your mouth, the the airway collapses, so the pharynx collapses. But when you breathe through the nose, it actually stimulates dilation. So, it's not just the effect of the nose, it's the effect here, but also you'll get stronger stimulus to the diaphragm. So, the nose actually affects here and the diaphragm. So you get this kind of, if a person's not too obstructed, and you tape their mouth and you stop them mouth breathing at night, you're actually going to help their breathing further down the track. You know, kids mouth breathe at night and snore and older adults mouth breathe at night and snore. And one of the reasons that older adults mouth breathe at night and snore has to do with the tone. It's got to do with the tone of the lips and tongue. And the tone of the pharynx. It's way too small.

Steven Bruce
Well my wife, Claire, who you spoke to before we went on air, she says she's ordering the tape right now. But I think in her case, it's just to seal the plastic bag up around my neck, knowing that she's like. We've got just over 10 minutes left, Rosalba, are there things that we as untrained Buteyko practitioners, or we're not trained in Buteyko perhaps or we're not familiar with these things. Are there things that you could tell us now that we could offer and suggest to our patients to help them get through this crisis?

Rosalba Courtney
By the way, I'm not, I mean, I was one of the early Buteyko practitioners, but I've sort of I've moved on and I actually call what I do now Integrative Breathing Therapy. And I'm interested in all kinds of breathing techniques and all different approaches, working from the evidence base, looking what's in the literature and sort of marrying the art and the science and anyone can do that. So you just look at physiology and work with basic principles. I mean breathing is really, has always been an important part of osteopathy. In the five models of care the respiratory circulatory model is one and the respiratory circulatory component of healthcare and of osteopathic care is really important because it impacts on all the other models, the other dimensions, which is sort of the biomechanical and the behavioral and neurological and metabolic. So, the way an osteopath usually would work with breathing is just trying to free breathing up, most osteopaths just trying to get a rib cage that's freer. And osteopaths will often do like, diaphragm releases pressing the diaphragm and trying to get the diaphragm to dome. And all that stuff's important. But I think that you need to sort of understand that it's really hard to change that rigid ribcage and release that diaphragm if you're not getting people to do breathing exercises as well. And because people, you know, breathing is really it's such a complex neurological act like your breathing control system is getting feedback from the neuromuscular system from the chemo receptor system, from high up from the cortex from the emotional centers. And so to retrain breathing takes, it's a subtle, fine art. And most people though, with that kind of training, what most osteopaths would find useful for their patients is just teaching them breathing nasally as much as you can, slow your breathing down, most people can do with slowing their breathing down, and relaxing.

Steven Bruce
Do you instruct people to try to count the number of seconds they breathe in and is there a ratio between inhalation and exhalation that's recommended?

Rosalba Courtney
I tend to not overdo the counting thing too much because you don't quite know where people are at. There is a perfect count of breathing, it's called the resonance frequency. And the resonance frequency of breathing has had a whole lot of research done on it as this sort of physiologically optimal rate of breathing. It's 5.5 breaths per minute. It's a little bit individual, it's between 3, but it's actually between 3 and 7 breaths per minute,

Steven Bruce
Sorry? 3 breaths per minute, gosh.

Rosalba Courtney
For some people, the resonance frequency is 3 breaths per minute, some tall person with a big ribcage. That's not how you should be breathing all day long, by the way.

Steven Bruce
Ah, right, thank you.

Rosalba Courtney
Okay. No, because honestly, it would be so weird. You wouldn't be doing anything but breathing. But the resonance frequency breathing, it's a way of breathing that people do when they're in a very, very relaxed state. It's a sort of a resetting type of breathing. It's a way of breathing that you can do to reset the autonomic nervous system. And resonance frequency breathing, there's been a bit of kind of controversy about should the inhale be equal to the exhale, or should the exhale be a little bit longer? And most of the research tends to indicate that if you want to get a parasympathetic nervous system response, you make the exhalation a little bit longer than the inhalation But it's important that people breathe functionally so you don't want people breathing like a machine just counting and thinking that they should always breathe in this optimal, perfect way. Because humans are not like that, we're not robots we're meant to be variable, flexible, functional, changeable. So with breathing, I try and get people to really just tune into their body, connect with their breath, slow it down, see if they can use different techniques to make the exhale a little bit longer and then we play with that sort of thing. So using things like pursed lip breathing can make the exhale a little bit longer. Using vocalising sounds, like the F sound or the S sound, can help that exhale get a little bit longer. And because-

Steven Bruce
And actually if people want to know more about the pursed lip breathing, Leon Chaitow went through that with us in an interview some time ago now. And one of the recordings on the website is Leon Chaitow talking about that.

Rosalba Courtney
Can I just say one thing is really important, because so many people with poor breathing, their problem is that they're hyperinflated. And that's another reason for making the exhalation a little bit longer than the inhalation because then they slowly train the hyperinflation out of the system and you'll normalise the length of the respiratory muscles, you'll get the diaphragm to dome again. Because with hyperinflated lungs, you can't dome a diaphragm on hyper inflated lungs. That's the reason for that. Okay, sorry.

Steven Bruce
We've had a question from both the Facebook team and the Vimeo team, and this chimes with me actually, they've asked whether you've ever come across inserts or dilators to help patients open up the nasal passages. And it chimes with me because I can remember as a young man, doing lots of physical training people were always saying "Breathe in through your nose and out through your mouth." And I could never get enough air in through my nose to do that.

Rosalba Courtney
Right, right, right. Yep, you can get nasal dilators. And they've been researched in sports people. And there are a number of them. There's one that's come out quite recently that I like a lot. It's called Mute Snore. Yeah. So Mute Snore but you wouldn't want to exercise with that, that one's more for using at night. And then you've got your Breathe Right nasal strips that-

Steven Bruce
I was told that the research showed that those have no effect at all.

Rosalba Courtney
No, they definitely have an effect. I was just reviewing a paper the other day. Well not reviewing it was actually reading a paper the other day because I'm working with someone on an article about nasal breathing during sport. And so I was looking at the literature and there been a number of studies done using the nasal dilation and showing that it really improved people's comfort and tolerance of nasal breathing during sport. It does work but you can train yourself to nasal breathe even without those nasal strips. Takes time but you can do it.

Steven Bruce
And is there a progression, you mentioned, you sort of hinted at this earlier, a progression in the way that you would try to encourage patients to nasal breathe?

Rosalba Courtney
Yeah. Yep. So you start them, I mean, you need to use things like breath holding a little bit of alternate nostril breathing, get them to really relax, learn to use a smile, open up their nose, and you get them to work with breathing at rest. And then you can use more vigorous breathing and then you can begin to use nasal breathing during exercise.

Steven Bruce
Okay, thank you. Lucy's asked whether you have any specific recommendations for eustachian tube dysfunction?

Rosalba Courtney
Yes, one of the most important things for eustachian tube dysfunction is stop mouth breathing.

Steven Bruce
Is this the answer to everything, stop mouth breathing?

Rosalba Courtney
Well, do you know I'm just talking about what the research says, that eustachian tube function in children is really strongly influenced by mouth breathing. But also it's tongue position and a proper swallow. So, with eustachian tube dysfunction, you want nasal breathing, tongue in the roof of the mouth and the tongue functioning properly during the swallow. So you want the tongue pushing up and back during the swallow. And someone who's mouth breathing with a low tongue position, it's really bad for the eustachian tubes. Do you know, a while back they're used to be these balloons that they'd give kids to blow up with their nose to improve eustachian tube dysfunction. And when I'm working with children, I do a lot of, I do actually have a game where we blow up a balloon with our nose but we'll play with other toys too. We'll have party blowers and things like that and we'll blow them up with our nose. And we'll do humming games and things where we blow and make sounds that with our nose.

Steven Bruce
With the humming technique you demonstrated earlier on, you said what people can do during the day. What's your guidance, how often and for how long each time?

Rosalba Courtney
There was a research study that was done with a man who had not been able to breathe through his nose for 18 months and he was completely blocked. So he did humming for 1 hour the first day. And then on the subsequent four days, he hummed 120 times, 4 times a day, and at the end of the week, his nose was completely clear. So I know that works. And I don't know for sure, but when I'm giving people practice just for nasal rehabilitation, I asked them to do a 20 minute session twice a day at first. Just to get over the hump and then we cut it down again. And I actually was involved in working with a team, we were going for a research grant in Singapore. And we were going to use this humming protocol in foreign workers in the dormitories where there was a huge problem with COVID. And so we developed this humming protocol, this sort of half hour humming protocol with humming and breath holds. And we were going to have them do it 5 times a day. Because seeing the doses that they were using in hospitals, and we went, well, we're gonna have to do a lot of this to get anywhere close to the doses in hospitals, which is like 160 parts per million. And when you're getting like 3 parts per million, like it's not really close. But then if you're home for half an hour, and you do it 5 times a day, you're just giving that constant stimulation.

Steven Bruce
What's the patient compliance with like on that? Because that's a long time and a lot of repetitions.

Rosalba Courtney
Long time. Well, we were making an app, we're going to do all sorts of stuff to improve the compliance. But, yeah, do you know if someone's sick and they can't do anything and they're scared. And it's something they can do and it's soothing. The people doing, when I was doing the online humming classes it's like people loved them. They absolutely love them. The feedback was, I just love this class, it's so good, it's so relaxing, it makes me feel so great. So people enjoy it it's not like it's a burden to do, it feels quite nice. And it can make you go from feeling really crappy to feeling quite good. So who knows?

Steven Bruce
I think we've got a couple of minutes left, Rosalba, somebody who's calling themselves 80, the number 80, Still, which I thought was quite clever. And I don't want to alienate all the chiropractors watching but A.T. Still is quite important to osteopaths. Still says, can you explain how parasympathetic response increases with longer exhalation?

Rosalba Courtney
It's to do with the baroreflex receptors. So, when you, look, you know what I don't know exactly to tell you the truth, but the vagal response from breathing basically comes from you breathe in, ribcage expands, negative pressure to get increased venous return. And so then the heart you get increased blood flow into the atrium, then you get something called the Bainbridge reflex, where the heart rate speeds up and you get increased atrial contraction or increased contraction of the heart. And then you get kind of like a stretching of the aorta and the baroreceptors there in the aorta, they will send a vagal signal. So with the kind of big, slow breath you kind of amplify that vagal response. But the longer exhalation it's just something that, it's so easy to measure respiratory sinus arrhythmia. You breathe in, the heart rate speeds up, you breathe out, it slows down. So, the vagus is the brake on the heart. And the vagus, of course, it's the nerve in the parasympathetic

Steven Bruce
Rosalba, we are out of time, and I suspect it's probably time for you to go to bed there in Australia at the moment. Can I assume that if our viewers are interested in your online courses, they can find them on your website?

Rosalba Courtney
Yes, yes. Yes.

Steven Bruce
Which is rosalbacourtney.com?

Rosalba Courtney
Is rosalbacourtney.com.

Steven Bruce
Yeah, okay. Which is of course on the slide behind me. It's been great of you to give up your evening to join us here and I'm impressed that the Zoom connection has survived the distance because quite often it peters out after a few miles. And yeah, we look forward to perhaps getting on the show again, because you've clearly got lots, lots more that you could you could offer. And I apologise to all those people who are watching us whose questions didn't get answered or didn't get asked by me because there were lots of them on my list that I couldn't get around to. But thank you again and it's been a pleasure talking to you.

Rosalba Courtney
You too. Thank you very much.