THE MODEL HEALTH SHOW

EPISODE 491

Snoring, Hypertension, Dental Health, & The Science of Breathing

With Guest James Nestor

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SHAWN STEVENSON: Welcome to The Model Health Show, this is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in to me today. I've got a question for you. Can the way that you read impact your cardiovascular system? Can it impact your sleep quality? Can it even impact the health of your spine? These are all things that we are going to explore today with New York Times best-selling author of the book, "Breath", James Nestor. And this is one of my all-time favorite conversations, and the science here is absolutely mind-blowing. There's so much today where we're shifting and putting our focus finally on the quality of our food as we've ventured very far from our normal natural human diet that we really evolved consuming. The same thing with our movement practices, people didn't have to get up and hit the gym, because you're going to get up and you got to go and procure your food.

Now today, we're trying to find ways to supplement the things that we're missing through our evolution. And one of the things that's missing today more and more, and as you're going to see with some of the science, it is changing the way that we look, and it is definitely changing the way that we perform. One of the things that is changing is how we breathe. And so, really dialing this in and adding this to our overall health equation is of the utmost importance. So, our nutrition, obviously matters, our movement practices, our sleep wellness, our ability to modulate and manage stress in the world today. But so many of... All of these things, so much of it is really determined by how we breathe. So really, really excited about this episode and in the same context, since we're talking about breathing, one of the things that we know for certain has a major detrimental impact on the health of our lungs and our ability to breathe, creating this kind of pro-inflammatory state and degradation is smoking.

Conventional smoking for decades prior to more recent times was actually propped up as something that's healthy. It was recommended in ads by physicians. There was no sign of things being negative. There were studies done to actually disprove that smoking had any impact on our lung health or on cancer, and things of alike, but finally, in recent decades, the truth has come to light. Now there's warnings on the pack of cigarettes that this can cause cancer, it's a very strong carcinogen. But even with us knowing these things, it is still a major behavior in our society, and I wanted to talk about this specifically because with something that is a powerful insult to our lungs like this, what about the day-to-day implications? The things that we're breathing in our environment, very abnormal, we've got tens of thousands of chemicals released into our environment that we've never experienced throughout human evolution. Not tens of thousands, really hundreds of thousands. There's about 40,000 chemicals that are approved by the EPA just for use in fertilizers alone, right?

That's just one aspect of the chemicals that are created and released into our into our environment. So how do we make our lungs more healthy and robust? Looking at a study done with smokers can help us to kind of peer into this and see what we can do. A study published in the Journal of Cardiology set out to find if Vitamin C implementation can help to protect smokers from oxidative stress and inflammation. So, they recruited male smokers to consume a Vitamin C standard synthetic supplement version of Vitamin C versus a very dense super concentrate of Vitamin C found in the highest Vitamin C dense food ever discovered, which is camu camu berry, C-A-M-U C-A-M-U berry, over the course of a one-week study period. And here's what they found, the research has found that the test participants who utilized camu camu berry over the course of the study period had significantly lower oxidative stress and significantly lower inflammatory biomarkers, like C-reactive protein than the study participants, than the smokers who were given synthetic Vitamin C.

For the researchers, this indicated that the combination of other antioxidants within the camu camu berries had a more powerful antioxidant effect and anti-inflammatory effect than standard Vitamin C products alone. This is the power of real food and real food concentrates, because we have an opportunity today, of course, to upgrade our nutrition, but as you know, the soil itself had a major impact on the nutrition that's coming through in various foods. So, we do want to have our eyes on supplementing with real whole food superfood concentrates. Something like camu camu berry is remarkable, because it's 700% of your RDA of Vitamin C, alright? And just under a teaspoon of it. But you combine camu camu berry with other Vitamin C dense superfoods like amla berry, that's A M-L-A berry, and this is another one of the most potent Vitamin C dense foods in the world, demonstrating anti-inflammatory performance, specifically in the endothelial cells.

A study published in the Journal of Diabetes, Metabolic Syndrome and Obesity found that amla berries significantly improved endothelial function and reduced biomarkers of oxidative stress and systemic inflammation in patients with Type 2 diabetes. The endothelial function is the major component that is now rising forward in the data showing where SARS-CoV-2 is creating the damage, is truly something that is targeting our vascular system. So, it's not just this tropism towards our lung tissue, but it's truly targeting our endothelial cells and our endothelial function, and these super dense sources of Vitamin C are really essential right now. So, this combination, camu camu berry, amla berry, together with my other all-time favorite Vitamin C dense superfood, acerola cherry is in one product without any fillers, without any binders, without any unnecessary ingredients. It's organic, it's sourced the right way, and it is the essential C complex from Paleovalley. And you get 15% off when you go to paleovalley.com/model. That's P-A-L-E-O-V-A-L-L-E-Y.com/model. Use the code MODEL for 15% off the essential C complex.

It is a must right now, and really just at any time, because Vitamin C isn't just about our immune system, it's also about tissue repair. Vitamin C combines with other nutrients in our bodies to make new tissue, even influencing the health of our skin. The list goes on and on and on. Vitamin C is an incredibly important nutrient, but we want to get it from real food, whole food sources that have peer-reviewed evidence to their efficacy. And this is what you get in this essential C complex from Paleovalley. Again, go to paleovalley.com/model and check out their snacks as well. They're just incredible. They're doing things the right way. Great snacks for the kids, for travelling. Check it out right now, paleovalley.com/model. Now, let's get to the Apple Podcasts review of the week.

ITUNES REVIEW: Another five-star review titled "Fantastic podcast" by AuntJenny5. "I just found this podcast in the last six or so months, I'm sorry, I did not find it much sooner, I love the content and format, as well as the study-based information that Shawn provides. The content is interesting and relevant. Thank you for your hard work and an amazing podcast."

SHAWN STEVENSON: That's so awesome. I'm glad that you found me as well, and there's no better time than right now. And this is why it's so important to pop over to Apple Podcasts and leave a review for the show. Let other folks know how important this information is, and let's create a movement, let's create a movement towards health and wellness and making health the norm in our society. It is possible, but this change is up to us. So, thank you so much for leaving that review over on Apple Podcasts, and now let's get to our special guest and topic of the day. Our guest today is James Nestor, and he's a New York Times best-selling author and journalist who's written for Scientific American, Outside, The New York Times, The Atlantic and more. His latest book, "Breath", became an instant New York Times best seller, and is translated now into 30 languages and also recently awarded the Best General Nonfiction Book of 2020 by the American Society of Journalists and Authors. And now to share his incredible insights into the power of breath, I like to welcome the incredible James Nestor. James, your book is one of the biggest best-selling books of the past few years, and people are blown away by it, but first question, what got you interested in the subject of human breathing?

JAMES NESTOR: Well, it wasn't one thing in particular, and I certainly never imagined myself writing a book about breathing or spending five years writing a book and researching breathing. It's so seemingly simple and mundane, but when I saw free divers doing their thing, these are people who can hold their breath for five, six, seven, eight minutes at a time, and dive to depths of 300 feet, 400 feet, I thought there's so much more to breathing than I had ever thought. And so, I went into the field, I spent several months just sniffing around. I said, "Is there a subject here, is there a story?" I'm like, "Nah, there's not." Maybe there's a magazine story, and so that's what I was chipping away at for years actually, until all the pieces of the puzzle just kept building up. And I had this file in my office that was about 12 inches thick, and

I thought, "Hmm, maybe there's a book in here." My agent said no, repeatedly, she's like, "This is the stupidest... "

I had to convince her first and then start from there, and finally she's like, "Huh, wow, wait, I'm breathing. I do have asthma, I do have sinusitis, my kids have ADHD." And so, you start seeing it everywhere, how terribly humans are breathing, and you say, "Maybe there is something here." And so, that's where I really started getting serious about it all.

SHAWN STEVENSON: That's what I really admire about your work, is that you're somebody who puts things into practice and using yourself truly, when people read the book, they're going to be blown away at the level of human laboratory that you get into with yourself and really testing things and seeing what works and getting out on the road and connecting with so many people in this field. But one of the big takeaways is really looking at what is first and foremost causing our natural breathing pathways to be obstructed. We are breathing very differently today as a culture than we did just a few centuries ago. Can you talk about that?

JAMES NESTOR: So, the main thing... There are many things, it's a perfect storm of things that have all come together to make us the worst breathers in the animal kingdom, the worst breathers that have likely ever lived on this planet. So, one of the main things is that our faces have changed, our mouths have gotten so small that our teeth no longer fit. That's why we have crooked teeth, because our mouths are too small, and teeth have nowhere to grow in straight, so they have to fight for room, they grow in crooked, they become impacted. So, no other animal has ever had this problem, and it turns out that our ancestors didn't have this problem either, and we know that because we can look at ancient skulls, and they all have 32 teeth, no wisdom teeth extracted, no braces, no head gear, perfectly straight teeth, and they didn't have impacted teeth.

And so, that brings up the question where you ask yourself, what the hell happened that this just turned on 300 years ago? And if you start tracing back those breadcrumbs which is an appropriate term, because bread and processed grains and canned foods and bottled foods and sugary foods, this is what destroyed our faces. Not only our mouth size because with a smaller mouth, you have a smaller airway, with a smaller airway, you have less room to breathe. But it actually impacted how we look. Our faces, we have drastically different facial structure than we did 300 years ago, 400 years ago, and it happened just like that once we changed our food supply.

SHAWN STEVENSON: That's so interesting. Yeah, when I was reading that in the book, I really thought about it like, you've never seen somebody like, look at that tiger's teeth, they're all crooked, and it just didn't come in right, ugly tiger teeth. No, it never happens anywhere else in the animal kingdom except for humans. And it's just... The question is why? Why are we

changing so much? And also, this change in the structure of our face has also created much smaller breathing pathways. So, let's talk about that and the implications that that has for us.

JAMES NESTOR: So, with some animals when they are domesticated and they're fed the same processed crap that we've been fed, this can happen. If you look at bulldogs and pugs and other brachycephalic dogs, they've been bred to have this really flat face, right? And guess what? They suffer from chronic respiratory issues. I was just walking past two bulldogs today trying to walk up the hill and they're just... You know? And then I walked past some other human dude, and he was doing the same thing, I was like... It's all over the place. Once you start seeing it, you can't unsee it. But any animal in the wild, just like any human in the wild, no hunter-gatherer has crooked teeth, even the hunter-gatherers that have still managed to eke out an existence today, their teeth are all perfect. So, that's a sign that something's gone wrong.

So, what happens when you have... I'll bring my guest on. He usually takes a while to show up for these things, but he's pretty on time today. So, what happens when your mouth starts growing backwards like this is you lose room in your airway. When you lose room in your airway at the back of the mouth, you start doing that at night, right? And what also happens is the upper palate of your mouth up here, when the mouth doesn't develop properly, when you're young, that palate can grow upward. So, if you have a clean thumb now, no dirty thumbs, you can place it on the top of your mouth, the roof of your mouth. And if there's a large indentation, which there's a very good chance there is, that means that that bone has developed and has moved in your sinus cavities, which makes it harder to breathe through your nose. So, it's harder to breathe through the mouth, it's harder to breathe through the nose. But most of us default by mouth breathing, because our noses are always stuffed up. "Oh, I have allergies, oh, I've got a deviated septum. Oh, my turbinates are too inflamed." And we've just become a culture of mouth breathers, and the air you take through your mouth and through your nose are two very different things that will affect you in two very different ways.

SHAWN STEVENSON: Let's stay on the teeth, because you mentioned that our teeth aren't coming into our mouth correctly, and this isn't seen anywhere else in the animal kingdom, except where we get involved in the domestication of animals and also changing the diet of our pets as well. But for us, it's so funny, the other day when we talked the next day I went to the dentist, I just so happened to go to the dentist. And we got into a conversation, I shared this with you, about cavities resulting from the way that we breathe, and this is something we never hear about and never talk about. We just think about sugar, sugar, sugar, and that's the end story, but the way that we breathe definitely has an impact on our gum health and our teeth.

JAMES NESTOR: Absolutely. And dentists had been writing about this over 120 years ago. So, one of the fun parts of my job is I get to not respond to email, not pick up my phone for weeks

at a time and just immerse myself in research, and I love it. And I'll tell you right now, I really miss that, spending weeks and weeks in a medical library, just reading stuff, you know? You're not really looking for any targeted information, you're just reading as much as you can and trying to collect and connect the dots between these different studies. And there are studies which I'm happy to share with you where dentists are saying mouth breathing is causing periodontal disease, it's causing cavities. And we know that that's true now, because when you breathe through your mouth, you change the pH in your mouth, right? And it becomes more acidic, and when it becomes more acidic, it becomes a breeding ground for bacteria. And so, Dr. Mark Burhenne, who is a well-known dentist and a sleep researcher who's been in the trade for something like 30 years, 40 years, he's treated tens of thousands of people. He says the number one cause of cavities is how you breathe. Sugar is a big one too, right? It's second to how you breathe.

SHAWN STEVENSON: Wow. We simply just don't think about this. I'm so glad to have this conversation. With that said, so what... So, you mentioned pH is being one aspect, and this gets in the conversation about oxygenation, and also the transport of oxygen through our blood, for example, and this is another thing that's impacted by the way that we breathe. So, what's the connection? If there's any, which I know there is, especially from your book, with breathing and our biggest killer today, which is cardiovascular disease, right? So, what's the connection there with the way that we breathe and circulation and issues like hypertension?

JAMES NESTOR: Well, we do know that there are no negative side effects to breathing well, you're only going to benefit, but that also doesn't mean that breathing is going to do everything for everybody all the time. And I just want to be clear about that. It's not a blanket prescription, although it can't hurt. So, there is some science, I wish there were more, looking at breathing and hypertension that is very convincing. Because what happens when you over-breathe, when you breathe too much, which is what you tend to do with your mouth, right? There's no restriction. Try to do that with your nose. It takes a lot longer, that's a really good thing, because the longer it takes, the more pressure builds up, the more efficiently you can extract oxygen from those breaths. And when you're breathing that fast through your mouth, you tend to be breathing the upper lobes of the lungs here, which are far less efficient than the lower lobes. So, you have to breathe way more to get less air, which causes you to breathe like this. You sound like a pervert.

And if you're around people will panic or perverts or asthma, who knows, maybe perverts started off with asthma and panic. And even people with chronic hypertension, they tend to breathe like that and there's science, very, very validated science to show that, to prove that by looking at exhaled CO2. So, just changing your breathing and slowing down you're breathing and being more efficient can slow down your heart rate. When you're slowing down your heart rate, in that diaphragm is moving fluidly and slowly, you will calm the body down,

which will bring your blood pressure down. So, to show you how effective this is, all you need to do is place your hand over your heart and you can breathe into a count of about three or four and breathe out to a count of about seven or eight. And you're going to notice as you exhale, your heart rate lowers, it gets slower and slower, this is how heart rate variability is measured, right?

So, if you're breathing more soft fluid breaths and you're exhaling these long exhales, everything in your body is going to change. This isn't some woo-woo new age stuff; this is basic physiology. And you can look at your heart rate variability as you're doing this, you can look at your blood pressure. So, that's a long way of saying there is some science that is to me pretty convincing, showing that breathing can definitely impact, sometimes have a significant impact on hypertension. I wish there was more, but why not try it? Because there's no negative side effects to doing it.

SHAWN STEVENSON: And like I mentioned before, I really love that you did try it and you actually did an experiment that you detail in the book, and you basically purposefully breathe through your mouth for a period of time, which as I was reading, I was just like struggling, why is he doing this? When is this going to be over? And I'm just reading a few pieces of a paper and feeling this way. So can you talk about this experiment? Why the hell did you do it? And what were the results that you saw with things like your blood pressure, with things like snoring and sleep apnea?

JAMES NESTOR: So, as a science journalist, I try to stay out of the story as much as possible. I know a lot of people who might have read the book might say, "Well, that's weird 'cause you're in the first page," but that's not my objective starting out here. And if you read my book proposal that I wrote before I even started this book, I was nowhere in the book proposal. I thought I'm going to stay so far outside because I hate it when authors keep inserting them and it becomes a memoir. I want to look at stuff that doesn't just apply to me, that applies to everybody. This is what the science says, this is what's going to happen to your body if you do this or you don't do this. However, that's the big caveat section of our interview here, I got to talk with Dr. Jayakar Nayak, who's the Chief of Rhinology research down at Stanford, one of the top dudes in the field and big nose guy, right? He's a Rhinologist.

He's the one who turned me on to all of the different functions that the nose serves, stuff I had never thought could be possible. How it helps balance and monitor endocrine systems, how it can slow down that air, how it releases nitric oxide, which fights off pathogens, including viruses. So, as we talked, he was explaining to me all of the problems with mouth breathing. He's like, "It's just a disaster and no one realizes it. It can even lead to chronic mouth breathing, and sleep disorder breathing, can lead to diabetes and ADHD and increase risk of stroke," on and on. And the science has shown us that for decades, but nobody knew how quickly those

problems came on. How soon does hypertension come on when you're over-breathing? How soon does snoring or sleep apnea come on, and no one had done a test, right?

He thought conducting the test would be unethical because he knew all the damage that mouth breathing could cause. And I said, "Well, what if I volunteered?" He said, "Okay." And so, I managed to get somebody else, Anders Olsson, flew out from Sweden. We had to pay for the whole thing. Stanford had no money for a test that did not involve drugs. And it was a 20-day test, 10 days of just mouth-breathing and 10 days of just nasal breathing. We ate the same foods, we exercised the exact same amount on each and every day, and we looked at our data three times a day for that entire course.

SHAWN STEVENSON: What happened? You got to share what happened.

JAMES NESTOR: That's the cliff hanger, right? You got to read the book everybody... No, no, no, I'm going to tell you what happened. So, the first thing that I noticed was my blood pressure was up about 25 points. I got home that night after eight hours at Stanford, getting poked and prodded and crap up by nose and pulmonary function tests and all of that, and my blood pressure was 168, which is like extreme stage two hypertension. Bad news, never seen anywhere close to that. It's really scary as well. So, I went to bed that night, I was just like, "Oh, I just must be fried here," and I started snoring for the first time that I'm aware of. We took baseline data for about two weeks, zero snoring... Or two minutes or three minutes of snoring on most nights, that two minutes to three minutes went up to about an hour and a half, the first night. I was like, "This is crazy." Next night was worse. Halfway through the experiment, I was snoring for over four hours a night. Anders Olsson, the other subject, was snoring for about six hours at night, we both got sleep apnea, we felt miserable, our athletics performance plummeted, we couldn't focus.

Our mouths were so dry, we had horrendous breath, I could go on and on and on, but it was so obvious how damaging mouth breathing is, and even during sleep, about 60% of the population sleeps with an open mouth, and how we breathe when we're sleeping, as I felt and saw personally, can definitely impact our snoring and sleep apnea and sleep quality.

SHAWN STEVENSON: You said it, alright. You were scared. I was feeling scared just reading the pages when seeing how high your blood pressure went, for example, and the sleep apnea and the snoring. These are all side effects. We tend to target those things is like, "This is the problem," but these are side effects of bigger issues, which for you, having the audacity like, "Okay, doc, plug my nose up as best you can, so I'm forced to breathe through my mouth, let's see what happens." And that experience was bananas, and also you guys went and did a test, got on the bike and tested your exercise capacity as well. And so, you go through this experiment and then you head back, you get this stuff taken out of your nose and now you're

going to focus on breathing through your nose. So, can you share what happened when you switched back over and also, let's get really specific on why is it so beneficial to breathe through our nose? What's happening there, that's making so many great things happen, versus what happens when we breathe through our mouth?

JAMES NESTOR: Sure. So, I wanted to make clear, I tried to make clear in the book that I did not view this experiment as some sort of jackass stunt, right? "Oh, I'm going to be as miserable as I can possibly get." What I was trying to do is to put myself into a situation that 25% to 50% of the population now contends with, they're habitual mouth breathers right? They're breathing through the mouth the vast majority of the day and throughout the night. So, this wasn't just a torture gag, it was to collect data on what happens when someone does this, and I really hope a larger study will be done in this. I know an N2 study, that's all we could afford. It was so expensive to do that, but that's not my role as a journalist. I just did this because I knew no one else was going to do it, and I've heard someone's trying to boot up a study with about 30 people right now. So, when we went back to Stanford and we were just like so fried, really irritated, the humor of having crap up our noses was long gone. We went down there, and I was so happy to get this crap pulled out of my nose. The problem was I thought I would just be breathing easy after that, and it took several hours, it wasn't until that night, that things really opened up and man, it's such a difference in the quality of life, in athletic performance and in sleep.

So, I went to snoring at my highest amount about four hours, four and a half hours throughout the night, to zero. Sleep apnea was completely gone within about two to three days. Anders Olsson had the same exact thing, this is a guy who was snoring for five, six hours, zero, zero snoring. So again, I want to say that N2 experiment doesn't prove anything, but what we were showing is just what science already knew. When allergy season boots up, guess what happens? Snoring and sleep apnea boot up. Why is that? 'Cause you can't breathe through your nose, and we've known that. So, there's no controversy about that, it's just how dramatically it affected us was what was shocking. It was not mild, it was so full on, and the moment we took that stuff out, we became nasal breathers, it just all disappeared. My blood pressure, the last day I checked, it was 116/81. So quite a difference.

SHAWN STEVENSON: Right, in a very short amount of time. This is an affirmation...

JAMES NESTOR: Very short amount of time.

SHAWN STEVENSON: How we can manipulate our blood pressure very quickly with our own physiology and just tweaking things that we have within us already. So, let's talk about what's happening when we breathe through our nose, because you mentioned something earlier, and I want you to lead in with this, you mentioned viruses, for example, and there's... Viruses are

on people's mind right now like never before, but is there a higher susceptibility to viral infections, bacteria, other pathogens when we're breathing through our mouth versus our nose. Is our nose doing something special to protect us?

JAMES NESTOR: Well, now is the time when the guest needs to come back on here. For anyone listening, I'm just holding up a cross-section of a human skull here, so if you notice when you take air in through the nose, you're forcing it through... Look at all of these structures it has to go through before it gets into your throat, and before it gets into your lungs. So, as it goes through those structures, your air is filtered and it's purified. So, our noses are the first line of defense for our bodies. There are millions and millions of cilia, these are little hairs, and there's a mucous membrane which catches crap, which is why when you sneeze or exhale, there's a bunch of gunk in your snort because that's like a sticky fly trap for stuff that's going up your nose, we have nasal hair as well. So, all of these structures are there for a reason because it is so healthier to use purified, cleansed, heated, moist and pressurized air than it is just taking air in through your mouth. When you take air in through your mouth, you might as well be wearing your lungs on your chest, just dangling them out in the environment 'cause they're exposed to everything in the environment, allergens, pollution, dust, mold, everything else. Our nose is our filter, so that includes, it's a great filter to help bolster your immune function and reduce the viral load around you if you are exposed.

These are not my opinions; this is the work that was done by Louis Ignarro who won the Noble prize in the 1990s for his work with nitric oxide. So, he found that when you expose viruses, and he was doing this 14 years ago, when the first round of SARS COVID case was going around, when you expose them to nitric oxide, the myelin cells can live so much longer. And that's why people with COVID have been treated in, I think, 11 or 12 clinical trials with nitric oxide, and it worked amazingly, amazingly well. So, we produce a perfusion of nitric oxide in our noses. Along with filtering that air, we're producing this molecule, which essentially kills off bacterias and viruses. I want to be very clear that I'm not saying if you breathe through your nose, you're not going to get COVID, you're not ever going to get sick. I would never say that. I'm saying that this is a healthier route, and it can help bolster your immune function and filter out more of that gunk.

SHAWN STEVENSON: There's so much here. So, versus breathing through our mouth, is there a percentage increase that we see breathing through our nose with nitric oxide?

JAMES NESTOR: Yes. So, we get about six times more nitric oxide breathing through our noses, so that's a lot, everybody.

SHAWN STEVENSON: That is.

JAMES NESTOR: And I know that you understand the benefits of nitric oxide, so I'll just give you a little side note here that Viagra and Cialis and all of those other drugs, guess how they work? They teach your body to release nitric oxide, that's why these drugs are able to open up the blood vessels and deliver blood so much more easily that way. That's what our noses help to do as well. And if you hum, you can increase your nitric oxide by 15-fold, 15 times the amount. So, humming, which humming is a part of many prayers, it's a part of many religions, it's a part of many mantras.

And I think that there's a reason because these prayers were, at least according to some researchers, developed to get us to breathe at a certain respiratory rate, and many of them include this deep vibrational humming, which can release a lot more nitric oxide.

SHAWN STEVENSON: That's incredible. That's really cool. And speaking of erections, you see this is...

JAMES NESTOR: Nice segue.

SHAWN STEVENSON: This is the greatest segue in the history of our show. Speaking of erections, our noses, funny enough, have the equivalent of erections as well. Can you talk a little bit about that?

JAMES NESTOR: There is no organ more closely connected to our genitalia than our noses, because a lot of people think that the nose is just... This is all just bone, and you breathe in, and air goes past that bone. No, that bone is just there to hold all of these different tissues in the mucous membrane and the cilia and all of these different structures. So, our noses are coded with erectile tissue. When you get a stuffed nose, you can't breathe out of your nose, guess what's happening? Those tissues are engorging with blood and blocking off your nose, and it's the same exact mechanism by which your genitalia gets erect. So, there is such a close connection with some people that whenever they get sexually excited, they start sneezing uncontrollably, because their erectile tissue starts closing in and it's called honeymoon rhinitis, it's common enough to have its own medical term. So, there's a whole bunch of other crazy research that was being done at the turn of the century looking at PMS and nasal erections and nasal inflammation, and that's where they started doing surgeries, and it ended up... According to these studies, ended up helping these women incredibly by removing some of those nasal tissues so that they could breathe more easily.

SHAWN STEVENSON: Alright. So from now on, everybody's going to think when they got a stuffy nose, I've got a nose boner. Thank you, James.

JAMES NESTOR: It brings a whole different context to Pinocchio, so whenever you're watching that... Whenever you're watching that with your kids, maybe you just keep that one to yourself.

SHAWN STEVENSON: Look away.

JAMES NESTOR: Look away.

SHAWN STEVENSON: Alright, so that's just one aspect of, again, filling with blood, but there's a cyclical nature also to our breathing that you highlight in the book that is really fascinating, and it's just highlighting again how we're so connected with the environment around us. One of the big things that we talk about here on the show that we've been just really pressing in the culture for years, is circadian medicine, and the cyclical nature of how food impacts our bodies, how hormones change throughout the day, but also our breathing changes with our nose throughout different times and different cycles. Can you talk about that?

JAMES NESTOR: Sure. So that erectile tissue is coating each side of our nose, both sides of those nasal cavities and it reacts differently, it doesn't react in unison, and so about every 30 minutes to three or four hours, one side of the nose will tend to dilate, that tissue will become more flaccid and open up while the other side tends to engorge, and this is called the nasal cycle, and it was discovered in the 1890s, by a German researcher named Kaiser. And nobody knew why our noses did this for decades and decades, until people started testing and looking at how the pathway through which we breathe air in our nose, either right nostril or left nostril will affect our brain waves, will affect our blood pressure, will affect our body's heat and our heart rate, and it turns out that the air... Breathed in like that through the right and the air, breathed in like that through the left, will have a very significant and measurable effect. So, the yogis were right, if anyone's been in a yoga class and you either begin or end the class with some alternate nostril breathing. There is science behind that now because we can measure it, and it's fascinating that they developed this stuff 2000 years ago, and we're just catching up to what they learned and were able to find out about the body's connection to the breath, our noses, and all of the different systems.

SHAWN STEVENSON: James, this is so phenomenal. I haven't shared this on the show before. I've shared the takeaway, which is, for me, when folks ask if I'm doing media interviews, that kind of stuff, what is the biggest thing that really helped to change my life to improve my health. And the number one thing is meditation, and it's kind of hard to describe, but you've added a layer of explanation for me. One of the things that... Of course, there's a direction inward and being able to analyze your thoughts and that kind of thing, but my mother-in-law, this is about 15 years ago, shared with me a variety of different meditations. She's been teaching meditation for decades and of course, alternate nostril breathing which I want to

circle back and ask you about that to give folks an example of how it works. So, we had that, but we also had the breath of fire or chaotic breathing was one of the meditations.

And then there were meditations that would stack them. My favorite meditation that I did every day for over a year, and this was... It was like over 30 minutes for this meditation, was a humming meditation, and it changed my life. And it wasn't just the inward exploration, it was this practice, this nitric oxide boost, like so many things in my life just got better and so... Of course, there's so much anecdotal evidence here, but we also have a tremendous amount of science, it's finally coming forward with our modern testing modalities, but this stuff has been known about for, as you mentioned, thousands of years. So, if you could, can you share with folks what the alternate nostril breathing is, how does somebody do that?

JAMES NESTOR: Sure. So yeah, there's a reason why if you were humming for 30 minutes a day in the morning or even at night, why it affected you so profoundly. There's the mental, the focus aspect, but there's also the physiological side. You're just uploading so much nitric oxide into your body, not only does that help with vasodilation, but it helps with oxygen delivery. It helps clean things up, there are no negative side effects to that either. And I'm a big fan of humming, I try to incorporate it when I'm working out. It keeps things more interesting and if I'm jogging around, I know I sound like a freak, don't really care too much 'cause I know I'm getting so many benefits from that. So alternate nostril breathing, there are so many different techniques, and I'll just tell you the basic, the foundation, and then you can play around with it. So, inhaling and exhaling through your left nostril will tend to calm the body down, heart rate will lower, blood pressure will lower, and you will tend to activate more stimulation on the right side of your brain. Now, there's so much crosstalk between the right and left sides, I don't want to get into that, but the right side is often correlated with creative thought. If you've ever seen Jill Bolte Taylor's TED talk about what happened when she had a stroke, and just the right side of her brain turned on, you'll understand the difference between these two.

JAMES NESTOR: So that's what that does, and it's also, it's stimulating the parasympathetic side of your nervous system, this calming side, that's why it does all those things. So, inhaling through your right nostril will tend to heat the body up, it will increase heart rate, it will increase blood pressure and it will tend to stimulate more activity on the left logical side of your brain. So, what we want to be is balanced, right? We don't want to be all sympathetic, we don't want to be all parasympathetic, and that's where I think people get this stuff wrong, is they say, "I just want to stay in parasympathetic the whole time, calm." No, your body wants balance, we have these two different modalities because that's what we evolved with for a reason. But this is a great little tool that you can use anywhere to just reset your body. A lot of alternate nostril breathing has you breathe through both nostrils, right and left, to maintain that balance, to get you back to a state where you're able to function at peak efficiency. And what is so fascinating, as you mentioned, is we have the latest modern technologies that has

been measuring the effects to this, and I was actually surprised how many studies have been done, at really legit institutions as well, Columbia, University of San Diego on and on.

And you can look that stuff up online, for free. I included about five or six studies in the bibliography of the book because that's all the publisher would allow me. I was like, "Can I put in these 30?" And they said, "No." Five or six, you can look up the rest yourself, but it's very significant too. It's not a subtle change, and the fact that we just have this at our disposal any time is great. It's simple and it's free.

SHAWN STEVENSON: Yeah, so good. And again, there's so many modalities as you mentioned, and even with the alternate nostril breathing, you could breathe in through one, pinch your nose close, and breathe out through the other, that's one of the ones you taught me early on. And just cycling and then you can go back and do the opposite direction. There's so many different ways to go about this, and so I will definitely put some resources for folks in the show notes, and of course, get James Nestor's book, it is one of the most important books, truly, of our time. And I want to circle back, because all this talk about breathing through the nose got me thinking about snoring again, which you went from having this basically over four... Was it maybe... It was over four hours a night, right?

JAMES NESTOR: Yeah.

SHAWN STEVENSON: Over four hours a night snoring to zero once you shifted back to breathing through your nose again, but you wanted to make sure, you had to train yourself to make sure that you're breathing through the nose, so you actually taped your mouth. So, talk a little bit about that. This is one of the hottest things on the streets right now for folks who happen to not know, is people taping their mouths when they go to bed, so... Let's talk about it.

JAMES NESTOR: So, this sounded completely sketchy to me when I first heard about it years ago and then I went on YouTube, and it seemed even sketchier. I was like, "There's no way I'm using nine pieces of tape to cover my mouth every night. I have a beard, it's idiotic." So, it wasn't until I heard from researchers, scientists in the field, Dr. Ann Kearney down at Stanford, she's a speech language pathologist. I went over to her office after I was hanging out with Nayak, I was at Stanford, I was in his office and I was like, "I'm just going to cruise around and try to talk to people," and she had this big roll of blue tape on her desk. I was like, "Well, what's that for?" And she said, "I give it to all of my patients." This is someone at Stanford, so this is not a fringy institution. And so, then I started thinking about it more seriously about what Nayak said about nasal breathing, what I had experienced in the test, and we use this in the test, but I did not think that this was going to be a permanent thing for me until I really started

looking at how many of us breathe through the mouth, how injurious mouth breathing is to our health, especially at night.

And it can increase snoring and sleep apnea, and that seems impossible, but the science is clearly there. And if you just look at the anatomy, when you're laying your head down on a pillow, first you've got gravity messing with you, right? It's going to throw everything back and make it harder to breathe. Add to that an open mouth, when your mouth opens, guess what happens to your tongue? It rocks back into the throat. You can try that right now. Close your mouth, breathe through your nose, you're going to feel your tongue naturally lifting to the upper palate of your mouth. That's where it's supposed to be. Notice all the space in the back of your throat. Now open your mouth, the tongue rocks back, right? So, this combination of gravity and these anatomical problems and all of the flesh being pulled back in your throat, blocking your airway can contribute to snoring and sleep apnea. I'm not saying that this is the reason why everybody snores and has sleep apnea.

Obesity plays a huge role in this. Neck size, even muscle, having too much muscle can cause severe sleep apnea and weightlifters know all about this, but if you breathe through your nose, you create that pressure, right? And you tend to open up the airway more, not only by allowing the tongue to get out of the way, but by having that pressure to push the airway open, those soft tissues. It had an incredible impact on my sleep, sleep tape... I've been taping ever since I did the Stanford test.

I am completely convinced, I can feel it, I can see it on my sleep data when I don't tape, and it's a profound difference, and this is the one thing I've heard more from anyone. I've received literally thousands of letters and DMs from people saying, "One piece of tape cured 30 years of snoring for me." And these people are so pissed off that they've been on five different drugs, and no one's told them that nasal breathing can influence snoring and sleep apnea. I want to be very clear again, I'm not saying if you have severe sleep apnea, severe snoring, I'm not going to say this is going to cure everything for everyone. It works really well for some people, it's free, there are only benefits to it. So, use common sense if you're going to do this, don't get duct tape, this is the stuff I use. No, 3M is not paying me anything, I wish they were. 3M, I'm available for sponsorship, but this is the tape I use. It costs like $3, it's called micropore tape, has a really easy adhesive on it. It comes right off, leaves no residue. I used about 20 different types of tape before I found this stuff. I use a piece about that big, about the size of a postage stamp, this is the technology. You guys ready for this? It's the latest thing.

SHAWN STEVENSON: Let's go.

JAMES NESTOR: That's it. So, yeah, I can breathe through the sides of my mouth if I want, I can talk that way. All this is doing is just training me when my muscles loosen, and I get unconscious

to keep my mouth shut. Some people like a fat strip across the lips, that's cool, whatever works for you. This works for me. So that's the sleep tape portion of this program here, everybody. Hope I didn't just talk your ear off there, Shawn.

SHAWN STEVENSON: I love it. I love it. And also, I shared this with you the other day too, when I was reading about your experiments, when I just started the book, I immediately thought about, he can't be married. There's a very high probability if somebody is sleeping next to you with your nose basically taped shut, there's going to be some conflicts of interest. Alright, so, can you talk a little bit about that? Because surprise, surprise, you are married man. How did she deal with you in all of this?

JAMES NESTOR: And so, my friends, these are the benefits of buying a major fixer-upper in San Francisco 17 years ago, which is what I did, and then basically hand-building this thing for 10 years, which was awful. Don't do it, anybody. Just get money and buy something. So, the reason I mentioned that is because right now where I'm sitting is a whole separate unit of the house, and this is my kind of lab, this is my domain now. I've got all my stuff set up here. So, there's also a bed, right? And it's a "guest room", but it's really my place. Guests can stay here when they want, so that's how it worked. There's no way I would put her through that being sleeping right next just... That's what we recorded every single night, and at first, we were laughing, we're just like, "Oh, we're so messed up. Oh, we sound like we're drunk." And then on the fourth day, we're like, "We're dying, just... "

SHAWN STEVENSON: Yes.

JAMES NESTOR: "Very, very slowly we're killing ourselves." And I'm happy to share some of that audio, but it's scary stuff, so that's a long way of saying, separate spot, separate bed, camera setup, we had about four different machines down here. And so, that's how I was able to do it. Don't do this at home in your own bed, everyone. You sleep tape, you could really get some points with your partners if you're doing that, because it can affect your snoring, and I've had a few people write me that said, it saved their marriages.

SHAWN STEVENSON: Yeah.

JAMES NESTOR: Is that true? Who knows, but I'll take it.

SHAWN STEVENSON: Yeah. I mean, I can imagine. I wrote a book on sleep, and I know that...

JAMES NESTOR: For sure.

SHAWN STEVENSON: That you don't just get together with another person, you also meet their sleep alter ego, you know? You could be sleeping with the enemy, and you don't even realize it, you know? And so, it could be a big... Literally a bed of conflict and giving people solutions when, again, so many folks try and they're unconscious. They're not trying to have this happen, but what we're doing here is, you're really just... You're training yourself, your physiology, your anatomy, you're training yourself to do what we're designed to do, which is to breathe through our nose. And there's a tremendous amount of reasons why we might not do that, but let's circle back and talk about this, because looking at how our breathing pathways have become more obstructed over time, a great question that you posed in the book is, "Why would we evolve to make ourselves sick?" And that baked my noodle, I just sat with that for a moment. Can you talk about that?

JAMES NESTOR: Well, this is a question I kept asking these biological anthropologists when I met them years ago. I had always learned in high school, in college that evolution meant survival of the fittest. That's what we're taught, right? Darwinism, only the best survive, and the rest get left out. And so, with every generation, we should be getting faster and stronger and better. That is so false, because the human species before us were taller than we are, they had larger brains than we did, they were complete badasses. If you look at Native Americans before they were completely destroyed by Westerners, they were about six to seven feet tall, right? They lived into their 80s and 90s without any other medicine than what nature was able to provide for them. So, I started wondering about this myself, and they said, "Well, if you don't believe us, even though this is what we do professionally, and here are the books on it," they said, "Just look at the rates of obesity, of asthma, of autoimmune diseases, of diabetes, of cancer, of heart disease, and look at how they've been going up in the past century," right? Precipitously double digits every generation.

Are any of these diseases good for us? Are the people with these diseases stronger and faster than anyone? No, because that's not what evolution means. Evolution means change over time, and animals can change for the better or for worse. So, the point of surviving is just to pass on your genes to a next generation. So, you could be so debilitated, you could be so sick, but as long as you're able to pass on your genes, the species survives. So, that's where we are right now. We're in this state of chronic illness, and we think it's okay because everyone around us seems to have some different ailment, but just going back in time and looking at the animals living naturally in the wild, they don't have the vast majority of these problems. So, that's where I was convinced that something so serious has been going on here that I had never even thought about before, and obviously it's a huge subject, but I just need to focus on the breathing side of it, and breathing has really taken one of the biggest hits to our health.

SHAWN STEVENSON: Yeah. You know, it's such an important point that with all of these skyrocketing rates of various diseases in a strange way, our bodies are adapting to help us to

survive. And there's a big difference between living longer and dying longer, you know? When you guys were listening to that tape, you are listening like, we're dying right now, and we can stretch that out, the body will adapt to keep you around a little bit longer, so that even if you're sick, you can still hump a little bit, carry it on, keep humans going. And I was thinking about this in the context of... And you use the term dis-evolution in the book. And I was thinking about earlier versions of ourselves and how even the idea of snoring was probably really non-existent, because it would be a disadvantage. Because at certain times throughout our evolution, we didn't have comfy secure homes, like, if you're in a cave somewhere and you're snoring, you're food. You can't, you can't... And literally, other animals are just waiting for humans to go to sleep so they can hear them and then cut to, we wouldn't be here, you know?

And so, this is another new phenomenon, and so going back and looking at how do we retrain ourselves, because our bodies have been adapting to the way that we've been eating and the way that we've been breathing. One of my favorite parts of the book is a story of George Catlin and learning from Native Americans about the importance of breathing correctly. That was so powerful. And again, you already mentioned the stature and the health, but it was purposeful, they actually were training their babies to breathe correctly. Can you talk about that?

JAMES NESTOR: So, this is a great example of someone who was able to explore a different culture, explore different systems of health before these systems of health were convoluted and compromised by Western people. So, George Catlin was a painter. At the beginning of his life, he was a lawyer and he switched to painting, he used to paint like governors and fancy people, and he got so sick of doing that that in the 1830s, he took off a loan with some paints and some canvases, and over the series of number of years, lived with 50 different Native American tribes before most of these tribes had really had any contact with Westerners, before they were given small pox blankets and alcohol and corn and processed foods. And so, he was able to see them and study them in their natural state.

And these were people that had lived in perfect harmony with nature for thousands and thousands of years, right? They had real systems, and what so many of us saw of Native Americans were after they were obliterated, and when they were living in different compounds and drinking too much, because their entire culture, their entire system had been decimated. So, he found that breathing was considered a medicine throughout various tribes, that they were all obligate nasal breathers, and we know that's true, because you can look at ancient skulls, and they all had these prognathic faces. About 40% of your profile is determined by epigenetics, which I know you have written about and know all about, so genetics plays a large role in how we look, right? About half of that is influenced by genetics, the other part is influences from our environment.

So, they were all nasal breathers to such an extent that they would try not... When they laughed, they would try to keep their mouth shut. It was very insulting to everyone if you had your mouth open, and this started at birth. So, mothers would softly close an infant's lips after they were done breastfeeding, they would look over them while they were sleeping, and if they happened to open their mouths, they would close them very softly. And they even went, don't try this one at home, everybody, but they even went so far as to take infants and place them on a board and they would have them sleep like that, so they were perfectly straight and they believed that not only did this inspire them to breathe through the nose, but it also gave them a handsome profile and a strong back. And if you see some of those Native Americans, you see what they're talking about, these people were complete badasses. And again, we only seem to see them in their state after they were given all of these polluting and toxic Western products.

SHAWN STEVENSON: It's so good, so good. These are things that we don't think about. Of course, we think about the spread of infectious disease, we think about the change in food, we think about the implement of alcohol and drugs and all the things that devastate anybody who's inundated with these things. But we don't think about breathing and how that's like a pillar of health in this context, and truly... And I know that you stated this, and obviously it's the title of the book, but the breath is the number one nutrient, it's bringing in the number one nutrient. Fasting is hot right now as well, like, you can go a significant time without food, even water, but the breath is critically important obviously. But there's also an ability... One of the things that you talk about, funny enough, is breathing less. So, let's talk a little bit about that.

JAMES NESTOR: So, it's just like there are benefits to eating less, right? To intermittent fasting or time-restricted eating, whatever the hell you want to call it. There's a lot of science behind it, showing how beneficial it is. I'm a big fan of it. I try to do it every day now, but I want to be clear that it's not just that you can become a healthy breather and you're going to be healthy. No, and I think that this was... We're so myopic in our view of health that some people think, I'm only going to eat healthy and then I'm always going to be healthy in every aspect of my life. And that's not true either. Just like, you can't just exercise and think you're going to be healthy, right? This is a whole integrative program, there's a foundation of health. Food is so important, not only what you're eating, but where that food comes from is so important. Exercise is so important. Sleep is so important, but breathing is too.

And so, a lot of us have been talking for years and years about the importance of eating right and exercising, but we haven't been talking about the importance of breathing. And you can eat any of the healthiest diets in the world, and you can exercise as much as you want, if you are breathing in a dysfunctional way, you are never, ever going to be healthy. And you see this with Olympians, you see this with people who are so dialed into health, but they have sleep apnea, but they over-breathe, but they're holding their breath all the time. So, I just wanted

to... Breathing as an absolute pillar of health, but it is part of a system of health, we need acknowledge and appreciate each of those different pillars.

So back to breathing less. So, when I say breathing less, when I mentioned that in the book, what I'm essentially saying is breathing normally. But the vast majority of us are breathing so much that breathing way less is normal. Just like consumption of food, so many of us are eating so much food, when we eat the amount that's actually good for our bodies, we feel like, "Oh, I'm not eating enough, there's no way this is enough." That's the right amount. So, when we breathe, the majority of that air we take in, if we're breathing too fast and too often, we won't use, we're just wasting it. If you're breathing at a respiratory rate of about 18 to 20 breaths a minute, which is not outside of the bounds of what's even considered normal, you use about 50% of that air. You're like, okay, that's cool, about 50%. If you slow down your breathing to a rate of about six breaths per minute, you use 85% of that air. So, a 35% increase in efficiency.

If you're an athlete, you're into performance, it's all about efficiency. Throughout the day, you think a 35% increase in efficiency isn't going to affect your energy levels, it's not going to affect your metabolism? Of course, it is. So, that's what the breathing-less concept is about, and when you start looking at the studies and science about how populations who breathe way more than the rest of us, even us who are breathing too much, like asthmatics, people with panic, all they've done is have these people control their breathing and symptoms have either reversed or sometimes completely disappeared. And there are dozens and dozens of studies to show this, and it shows you just what a powerful tool our breath is.

SHAWN STEVENSON: We've got a quick break coming up, we'll be right back. Mental performance is more important than ever, and there are specific foods that are proven to enhance our cognitive abilities, like few things can. A study published in advanced biomedical research found that royal jelly has the potential to improve spatial learning, attention, and enhance our memory. And to add to that, it was found to be anti-microbial, anti-tumor and anti-inflammatory. One of the biggest issues we're facing with cognitive decline, with diminishing brain health is neuroinflammation, specifically hypothalamic inflammation. With our hypothalamus being a master regulator of our endocrine system and our nervous system and addressing this helps not just our brain work better, but our body working better as well. Royal jelly has also been found to facilitate the differentiation of all different types of brain cells, and to top it off, researchers in Japan discovered that royal jelly has the power to stimulate neurogenesis in the hippocampus. This is the memory center of the brain. Very few things ever discovered have been found to be able to do this.

This is the power of royal jelly. Royal jelly has been prized for centuries for all of its metabolic and cognitive benefits, but this is just one of the most remarkable superfoods for the brain. Another one of my favorite things is a bacopa. A randomized double-blind placebo-controlled

human trial, the gold standard of clinical testing published in 2016 found that after just six weeks of use, bacopa significantly improved speed of visual information processing, learning rate, memory consolidation and even decreased anxiety in study participants. Now, I've got both of these powerful superfoods together, they're one of my all-time favorite nootropics, and it's called B.Smart from the incredible folks at Beekeeper's Naturals. They're dedicated to sustainable beekeeping, that's where this amazing royal jelly comes from to deliver the cleanest most bioavailable forms of bee products, and they're committed to third-party testing for over 70 pesticide residues commonly found in bee products with some of the most pervasive offenders being things like DDT, that's again, commonly found in bee products.

They also test for a wide variety of other things commonly found in bee products that a lot of folks don't know about, like, heavy metals like, arsenic and lead, and also testing for E. Coli and Salmonella and things that you do not want coming through with the incredible bee products that we're trying to get and get the value from. We don't want toxins and poisons coming along with those things. So, I'm a huge fan of Beekeeper's Naturals, and my favorite thing, my favorite nootropic is B.Smart from Beekeeper's Naturals. Go to beekeepersnaturals.com, for 15% off the B.Smart and all of their other incredible products. You've got to check out their Superfood Honey as well. It's amazing. Go to B-E-E-K-E-E-P-E-R-Snaturals.com/model, you're going to get 15% off all their incredible products. B.Smart is a must-have for mental performance. Pop over there, check them out, beekeepersnaturals.com/model. Now, back to the show.

SHAWN STEVENSON: In the book you make a distinction between pulmonologists, which again, there's a certain way of thinking, there's a certain way of education, and some of the data with things getting better is really limited. So, it's dealing with a lot of chronic conditions and just trying to keep people alive, again, just dying longer. And you also talk about... Which there's still some wonderful work there, and especially everything has its place, but you really highlight situations and just some of the most incredibly documented instances of these folks that you call pulmonauts versus pulmonologists. So pulmonauts, and this got me into really thinking about, okay, so we know about improving our circulation, cardiovascular system, improving the health of our teeth, we know about reducing issues like snoring and sleep apnea, which have a tremendous amount of implications with becoming insulin-resistant, weight gain, etcetera, etcetera, but you brought up something that I didn't even think about until I saw it, and it was the story of one of these pulmonauts, it was Katharina Schroth. And I'm going to ask you the question, can changing how someone breathes potentially improve their spine?

JAMES NESTOR: Without a doubt. The answer is an unequivocal, yes, it can. So, the difference between pulmonauts and pulmonologist is... My father-in-law is a pulmonologist, my brother-in-law is an ER doctor. There's doctors in my family, we talk about this stuff all the time. They do incredible work with the resources that they're given. If you get in a car accident, if you get

lung cancer, if someone stabs you in the lungs, like, don't go to a breath work class people, go to a pulmonologist, get some surgery on that.

SHAWN STEVENSON: I'm going to breathe it out, I'm going to breathe this knife out.

JAMES NESTOR: But they're the ones who told me, we're dealing with the walking dead, right? If you can't breathe, see us. You want to know how to breathe for prevention of disease, that's not what we do. That's a whole other department. And I said, "Well, which department is that?" And they went, "There's actually not a department for that, a breathing department," right? There's a department for the lungs. If you look at the NIH, all of their different departments, right? There's lungs, kidney, brain, genitalia, but there's no department of breathing and breathing health, because breathing isn't just something that affects the lungs, obviously, breathing is something that impacts every single cell in your body and it's fallen through the cracks. Is it anatomy? Is it physiology? Nobody knows, which is why there hasn't been a lot of focused study in it, because you can't get an MD in breathing. And that's the reality of it.

So, I kept finding people who were not doctors, they were not pulmonologists, but they understood and contributed to our appreciation in the science of breathing in such significant ways. I said, "Well, what do I call them? Breathing enthusiasts, breathing fans?" And so, I came up with the term pulmonauts, and that's an umbrella term, that pulmonologists are in there, breathing therapists are in there, anyone who focuses and tries to advance this is underneath this umbrella. So, this was a crazy story that I was sure could not be true, and what it is, is, or the history behind it is, there is this lady who was growing up in the early 1900s in Dresden, Germany and she had scoliosis. Still to this day, we don't know what causes scoliosis, okay? Some certain genetic diseases can contribute to it, but for most people, we don't know what causes it. And some researchers have said, disordered breathing when we're young, that's what causes scoliosis.

That's not my hypothesis, so I'll be happy to share the resources on that later, but she had scoliosis, was given a brace and a wheelchair and told here you go, have a good life, we have no treatment for you. And she understood that we have these two huge balloons right in our chest, right? We can exhale. Look what happens to your posture when you exhale real deep and then inhale as deeply as you can. It's really hard to have this curved shoulder hunched over posture when you're inhaling very deeply. Naturally, your lungs will inflate, and your posture will immediately improve. So, the ancient Chinese had a quote that said, "What the bodily form depends on is breath, and what breath relies upon is form. When the breath is perfect, the form is perfect too."

So, she took this adage and she applied it to her own body and breathed her spine straight and went on to teach this to hundreds and hundreds of people that we could use stretching and

our own breath to breathe... To breathe a scoliotic spine straight again. I included the study in the back of the book, it's on the website, there's videos, there's pictures, it all happened, and at the end of her life, she lived to be about 91, she was given a medal by the German government for her contributions to medicine. So, this is real stuff, and it just shows you the power that breathing can have on basically every function of your body.

SHAWN STEVENSON: You know, I love these stories, and you've really sprinkled them throughout the book, and it highlights an important tenet, and I don't know if you've thought about this, but so often you mention this, it'd be like a few words within it, that some folks come along, the pulmonauts that you talk about, and they start to see these results. As a matter of fact, they could be widespread results that they see, but then they become a little bit vilified, they're considered to be crazy, this can't actually work, and then later on, the story changes and like you just mentioned, her ended up getting a medal from the government. So that's really powerful. And another one of those stories... And this for me was probably the most remarkable, was the story of a man who, I believe he started off with music, a fellow named Carl, and within that helping musicians... 'Cause that's a thing that we don't think about. How the hell is Beyonce... And also, same thing with a trumpet or a saxophone, but then that ended up leaning into the realms of athletics and him working with Olympic athletes, literally breaking world records, the folks working with him. Can you talk about that a little bit?

JAMES NESTOR: So, I was not looking for these stories where these people were these outsiders doing something against the grain, but it just so happened to be that basically every single piece of research I was looking at followed the same arc, and it's not just in breathing, throughout medicine and nutrition, there are people who find something to be true, it's proven with hundreds of people, they are vilified. Everyone says they're quacks. They have to die first. That's what happens most often. And then they're celebrated for being the inventors of this new way of thinking, this new way of looking at the human body. Ignaz Semmelweis was the guy about 200 years ago, I think, who was telling all these surgeons, he's like, "You guys got to wash your hands. You're spreading germs all over this place because you're not washing your hands," because it was like a glorified thing to cruise around and be just covered in blood and guts if you were a surgeon. And all of them told Semmelweis that he was completely insane and Semmelweis ended up and in a mental institution and dying there. And turns out he was 100% right. So, this isn't news, and anyone who looks at the history of medicine, especially, you see the same pattern over and over.

And Carl Stough unfortunately fit right into it. He was a choral conductor in the '50s. He noticed that a lot of his singers in the chorus, they were singing okay, they were singing on key, but they were not able to hold notes for very long. And he looked at their breathing and noticed that they were breathing in a very shallow way. So, the only thing he did was he would get them to exhale more, to move that diaphragm up and down a little more, and by doing

this, they gained better resonance in their voices, they felt a lot better after they were singing, and he got so famous doing this, he retrained opera singers at the Met Opera. And word got around town that he was this master at breathing, and he was brought into the VA hospitals on the East Coast to help people with emphysema who were essentially left for dead, they were literally put on these beds with pillows on their backs, so they were like this...

They were given oxygen, shot up with antibiotics and left there to die, nobody knew what to do with them. So Stough went in and noticed that emphysemics, they weren't able to engage their diaphragms, every breath they took was with their shoulders, and their necks would tense and... These are people breathing 20,000, 25,000 times a day. If you're struggling 25,000 times a day, what's going to happen to your body? So just by using breathing alone, so many of these people left for dead walked out and went and lived normal lives. And I've heard from some of them since the book came out, which was extraordinary. They said, "This guy absolutely saved my life in every way. He allowed me to understand and appreciate breathing, and that's what saved me." So, Carl Stough worked in the medical establishment, all of the hospitals for about six or seven years, and it was all documented, there's data there showing what he did. He was still derided the whole way because he wasn't a doctor until the Olympic committee asked him to re-train runners, the men's track team for the Mexico City Olympics, which is held at an elevation of what, 5000, 6000 feet, Mexico City in 1968.

And he trained these people how to breathe properly, so they didn't need oxygen before or after the race, they were the only team not to need it, and they destroyed everybody. It's still, I believe, the greatest track performance ever in Olympics history, and several of the runners said it was because they knew how to breathe properly.

SHAWN STEVENSON: That's powerful. And you said it, they absolutely dominated, and so much even in the interviews, post winning a gold medal was just giving him credit, and same thing, he was vilified like, "This is nuts," and ends up helping so many people. And I just want to take a moment and just throw this little seed for everybody. What are we doing now today that we're going to look back on as totally... We were wrong, we were wrong, we thought we had everything figured out and then something comes along and changes how we think, so being open to that, because these stories are seemingly miraculous, somebody healing their spine, somebody helping folks to win a gold medal, break world records, the list goes on and on, people being able to end decades of snoring instantly. I want to ask you a little bit about this because you said the word earlier, and it's such an important aspect of this, because I think when we think about breath, we think about the inhale in particular, let me get as much oxygen into my body as possible, and be stingy with this oxygen, but in reality, so much has to do with the exhale. Why does this matter? How does this play into everything?

JAMES NESTOR: Because a lot of us, we believe that the healthy aspect of taking the deep breath is... And you see people, especially when they're working out, right? This is how they breathe. Packing air on air on air, but if you're doing that, you're able just to squeeze in a little bit of fresh air each time. If you want to get the most out of your breath, you need to get the stale air out before you get fresh air in. And you do that by engaging the diaphragm. So, the diaphragm is like this parachute shaped muscle that sits underneath your lungs, because the lungs are just two balloons, fleshy balloons, they don't do anything. They need something to do it for them, and that's what the diaphragm does. So, when we exhale, the diaphragm goes up, and when we inhale, it goes down. And by engaging the diaphragm and getting that exhale out, you make so much more room for fresh air, and with that fresh air, you can extract so much more oxygen. And while you're breathing this way, you're breathing fewer breaths, right? You're not moving your diaphragm up and down like this the whole time, you're being much more fluid with it, but you're breathing more efficiently. So, with fewer breaths, you get more oxygen.

I should also note, and this is relatively new to me, and I've been fascinated by it, that the diaphragm is not only a primary pump for blood, so it works with the heart to help pump blood, but it's also a primary pump for lymph fluid. And so, when people aren't moving their diaphragms, when their diaphragms are just sort of caught moving at around 10% capacity, lymph fluid can efficiently purge out of our bodies. So, there's so many reasons to take a deep breath, not only for efficiency and gaining oxygen, but also to pump out waste products, the waste products in our breath and the waste products in our bodies.

SHAWN STEVENSON: This is so good. In the book, you actually mention is, and this is a term that's used, a second heart, if you're talking about the diaphragm, it's that important. And again, this is something we can... And I know that a lot of folks have heard this during this episode, probably 50 times by now, is thinking about your breath, and it's one of those things it's part of the autonomic nervous system, but it's different in another thing in that same vein is like digestion of your food. You can't jump in and do that, you don't want that responsibility anyways, but you could jump in and grab the steering wheel of your breathing, and it happens automatically, but you can proactively get in there and steer where this is going and change your physiology, by you consciously doing it. So, I know that a lot of folks have thought about their breathing, and the thing is, was I not breathing before? Who knows? But what you do consciously, you can start to train your body to do automatically, is one of the big takeaways that I'm getting. And I want to ask you about this, and this is really fascinating stuff too, because now we've got the tenet of breathing less, and I know that there's some guilds of thinking that you have a certain amount of breaths in your lifetime.

It might be like a daoist tenet, but to breathe less, to breathe more deeply, but then there's also a segment of not breathing that you talk about. And I want to share this with you because

I've never talked about this before out loud, except with my wife, but when I would do this meditation, there's a certain meditation my mother-in-law taught me, it was stacked, it was like, you do the chaotic breathing, "breath of fire" and then you do the humming. So, it was like seven to 10 minutes of each I believe, it's been a while since I've done it. And then you just sit, and you think about the various organs/chakras as you go down, and then some other stuff after that, but here's the thing, after doing the chaotic breath and then doing the humming, I would just... When that part is done, I would just not breathe for several minutes. I would just sit there, and it felt like it was just the right thing to do, it felt like it was so natural, and I've never felt as tapped into the reality, the universe, just, I can't really explain it. And I wasn't breathing this whole time, and then several minutes later I realized, "Wait a minute, I'm not breathing, but I feel amazing." Can you talk about what might be going on there?

JAMES NESTOR: One of the earlier translations for the term "pranayama" was trans-induced by holding one's breath. So, breath-holding has been a part of yoga for thousands and thousands of years. It's also an essential part of Qigong and it's a part of Sudarshan Kriyas, it's a part of Wim Hof method. It's not a coincidence that so many of these breathing techniques have you inhale very quickly, whether you're doing Kundalini or you're breathing along with Wim, you're going for it, and then you're dropping off. You're either breathing very slowly, or you're not breathing at all and then guess what happens again? You're going to be very, very quickly... And then you're going to drop off.

Because what you're doing when you're breathing this way is you're teaching yourself how to control your nervous system function. So, you are causing your body to become stressed, and that's what happens when you breathe very quickly and forcefully, that's a stress response, but it creates a hormetic stress, this is a beneficial stress. And then when you breathe very slowly, you hold your breath, you're relaxing yourself. This is the parasympathetic state. And so, by balancing between the sympathetic and parasympathetic, you can put yourself back online, and that's why these breathing techniques are so good for people with autoimmune diseases, with anxiety, with panic and more, because these are people who have some imbalance in their body and their immune function or how their nervous systems are always turned on constantly. And it's a great way of learning how to turn it on, but also how to turn it off.

JAMES NESTOR: So, another quote I'm going to mention, because you said how many breaths we live in a life, I think it was BKS Iyengar, famous yogi, who was totally sick as a kid and then learned yoga and lived to be like 91 or 92, but he said, "A yogi's life is not determined by his years, but by his breaths." So, these slower, more fluid breaths, well, according to him, allow you to live longer. We're given a finite amount of breaths, you can blow them all in your first 50 years, or you can extend them a bit and maybe live a little longer and a little healthier.

SHAWN STEVENSON: I love this so much, and this is just getting us to thinking more about taking advantage of the breaths that we have left, really making the most of them. And I love the analogy when you mentioned us breathing and basically breathing air on top of air on top of air and making like an air sandwich, a stale air sandwich in our bodies versus really exercising our inner matrix, our tissues, our diaphragm, because we have the ability to consciously do this and really make ourselves better. And we talked about this the other day, and I asked you about this because your book came out during this, the time of COVID-19, the era of COVID-19, and you're out there working to teach people about breathing, and suddenly folks now are wearing masks, everybody's breathing is obstructed in a strange way. And some of the data that I share with you and talk a little bit about... For me, I'm really looking at what are some of the underlying implications that we would have and just subjectively seeing folks, once we put something over our face tend to breathe a little bit more shallow, whereas for somebody like myself, I remember going to the DMV of all places, which is not... Already... If anybody's seen Zootopia, the sloths work at the counter. It's already a tough situation. But now, COVID... I tried to get there early 'cause I think it opened up at 8 o'clock, I got there at 7:00 AM, massive line already.

Alright, welcome to LA. And so, I go through this experience, and you have to, of course, be masked as you're in there. And every time when somebody gets up out of a chair, then they come over immediately spray the hell out of the chair so the next person could sit down. Of course, that's science. But anyways, for me, I caught myself breathing shallow and I use it as an opportunity to actually breathe deeper, but I'm aware of this stuff. And that's one of the big differences that I wanted to ask you about. So, for you, having your book come out about breathing and then suddenly looking out your window and the whole world is wearing a mask, what did that make you feel? Is this... Is it going to exacerbate some things that we don't know about? Is there a negligible issue? Let's talk about that a little bit.

JAMES NESTOR: The book came out on May 26th of 2020. And if you can remember back that far. It's hard for me 'cause what a year everybody, we've all had. Lockdown started in the middle of March, so the book came out six weeks into this unprecedented global event. Right when the book came out, this was great, someone wrote and said, "Oh, good job, cashing in on Coronavirus. Real opportunistic of you." I'm just like, "Dude, this book was printed in January, you know how publishing works, Shawn?"

SHAWN STEVENSON: And all the years you've put into it.

JAMES NESTOR: It was in catalog since September, so no, no one had some inside knowledge from the CDC that we were going to get racked with a Coronavirus infestation around the world, so... And I had been working on the book for five years solid and have been picking away at it for the past decade. So, it was just the most insane coincidence ever. And you know, we

weren't even going to release it at that time because distribution was all messed up, there's no one to print it. We didn't know how we were going to ship it out and we did anyway, and I'm glad we did because I think that people right then were like, "Huh? Maybe my breathing might matter in my life?"

JAMES NESTOR: And so, it just suddenly came at this moment when this window opened, so you know, the first thing everyone started doing was wearing masks, and I had these same thoughts, and throughout the year, I haven't been digging too deeply into this, but I've been picking away, sniffing around. What I see is that there's two things happening when people wear masks. The first thing is the physical aspect of mask-wearing. If a mask is worn properly, and if you breathe properly in a mask, there is some evidence suggesting this can be effective at a certain level. Okay, that's debatable. I'm not on one side or another side of this argument, I'm just... The stuff that I've reviewed. However, what happens when people put on a mask is they immediately... If they were nasal breathers before, they drop their mouth open and they feel that they can't breathe, so you start breathing too much, and then they start breathing really shallow, and then they get a little panicky and they get nervous, and their breathing goes to hell.

And I think that that is the biggest downside of wearing a mask is your mental reaction to it because in the various studies I've seen, except for the one you shared, which I thought was so powerful looking at pregnant women and mask wearing, and SpO2, but in the ones that I've seen with hundreds and hundreds of people, SpO2 won't go down even if you are an athlete and you are exercising at really top zone for, it won't go down if your breathing is locked in and it's compensating for wearing a mask, and that is the most important thing. So, it's my understanding, this is my belief, this isn't so much a scientific observation that if you're wearing a cloth mask, you bought off of Etsy and you immediately go to mouth breathing, that mask is doing nothing. So, nasal breathing with a proper mask used properly, I believe, can have a benefit in helping to protect you, but what I wish people would do is to do studies into other protections, Vitamin D, plant-based diets, nasal breathing in and of itself, what can that do to help bolster our immune function. So that's a very long answer, but this is an extremely complex subject, and I'm just trying to look at the data and not trying to get into the politics of it.

SHAWN STEVENSON: And that's what's so unfortunate. This shouldn't be political. We should just be able to talk about this stuff, look at all sides. I was thinking about this earlier, at this point, and we can make it so where it's a requirement. Whenever we have some type of policy being made, it should be mandatory, you have to bring in somebody that believes the complete opposite and look at their data before you make a decision. It is mandatory, because science is not static, it's constantly changing and evolving, and I mentioned this to you before... So going to the dentist, for example, and inquiring with her, what is this phenomena with mask

mouth that dentists are seeing right now, and the implications there. Have you seen anything about that?

JAMES NESTOR: This is exactly what I'm talking about. So, I think before the government told everyone to wear a mask, you needed 10 minutes of breathing instruction, because... You know, I love to experiment with stuff, so I got a pulse oximeter, this is a cheaper one for $25, but I also... I have a really good one, that was about $200, and I would put on about three or four masks, and I would walk around and I would look at how it would affect my SpO2, and most of the time it wouldn't affect me at all, but sometimes if I was breathing at the same respiratory rate as if I didn't have a mask, I was like, "Oh, maybe it's gone down 2 percentage points," right? Maximum, maybe one or two percentage points. So, when I was wearing this heavy duty super medical mask that my brother-in-law, who's an ER doc who was dealing with Coronavirus patients for six months, nonstop, never got it because he was really adamant about wearing a mask and a shield and being clean, but I would have to increase... Slightly increase the volume of air, I was taking in, just real slight and it would make a difference and I would...

There would be no difference in the numbers... In my SpO2 numbers. So, the fact that we just told people to wear a mask, we didn't say it has to be an N95, we're actually told not to wear N95 masks, we said, "Oh, you can wear some cloth thing, that's not researched at all, that's basically gauze, single layer. That's fine." No breathing instruction. And so, guess what happens when you have a bunch of people who think because they have a mask on, that they're not getting enough oxygen, which is very rarely the case, they will open their mouth to breathe more and to breath shallowly. We were talking about acidity and the shift in pH in your mouth when you're mouth breathing. Just imagine what happens when that exhaled air, when some of it is still trapped within that mask. So, you've created a cesspool in your mouth, and I think it will be interesting to see a year after people wearing masks, if these are people wearing masks all day, what's happening to their cavities, what's happening with periodontal disease. We're never going to see those studies. I just took my...

JAMES NESTOR: It's never... It's never... Who's going to fund that? Right?

SHAWN STEVENSON: Hey, you know what's so crazy is that... And I saw this at the very beginning, there's a big potential for this to be integrated into our culture, and seeing this cyclically every cold and flu season, for example, so people... And I love this because even folks like yourself, you spark the minds of other people, where now we've got some people, possibly an N30 study coming where they're going to block their nose and do the crazy thing that you did, and really seeing how impactful this is. And so, I think people are going to ask these questions and we're going to see more science coming down the chute here, but I wanted to mention this because with the cloth mask, I sent this over to you as well, and this was published

in the BMJ, we'll put up for everybody to see on the video, but they saw... I'm sorry, 13 times greater incidents of viral infections in folks wearing cloth mask versus surgical mask. And then we get into what's going on there? Is it creating a wet micro-climate on the face and a vector for pathogens to pass through, is it changing the breathing in a different way? There's so many questions here where we were just told... Just wear something, anything works, grab a pair of jeans, cut it up, put it on your mouth, whatever, and it's so far from the truth.

And there is efficacy seen with the N95 in this study that you mentioned earlier, and this is published in Antimicrobial Resistance and Infection Control. Now, this was on pregnant healthcare workers, which there's a different oxygen requirement there. Your breathing is inherently going to change, you're breathing for two folks, but what the research has found in wearing the N95 mask, because you got to remember, most of us are not... We're not trained breathers with the same level of intention as somebody like James and all the people that you've learned from, and so we have a highly thermo-sensitive nature of our face, and so I think this... It might be just a reaction where we start dropping down and breathing through our mouth, but these women, they wore N95 masks and they found that this reduced their normal volume of air displace between their inhalation and exhalation by 23%, the volume of gas inhaled specifically from their lungs each minute was reduced by almost 26%. Their volume of overall oxygen consumption was reduced by about 14%, and their ability to expire carbon dioxide was reduced by about 18%.

And I want to ask you about this one specifically, but the bottom line is this, this all happened within 15 minutes of wearing the N95, so we can't just haphazardly do this stuff and think there's not any biological ramifications. This has to come with some training, this has to come with more thought, because we can use it as an opportunity potentially to breathe better against force, like when folks proactively decide, I'm going to get this high-altitude mask to be able to perform better in my sport, for example. Potentially we could find some positivity here, but I specifically want to ask you about carbon dioxide because I think we now are experiencing a time where people think carbon oxide is just all bad. We want oxygen in, carbon dioxide out, it's bad for us. Let's expand that a little bit and talk about carbon dioxide in a healthier context.

JAMES NESTOR: Well, CO2 is absolutely essential to our bodies, we have about 100 times more CO2 in our bodies than we do oxygen, and CO2 gets a bad rap because it's caused climate change. And if you don't believe me on that one, you can look at a 1000 different scientific studies, we can have a whole different conversation about that, but we need a balance of CO2 and oxygen in our bodies, and if we have too little CO2, we actually make it harder for our bodies to use oxygen. And I'll show you what I mean. If you take 20 very heavy breaths, deep breaths, you're going to feel lightness in your head, you might feel some tingling in your fingers, that's not from an increase of 02, that's from vasoconstriction because we need CO2 to open up our blood vessels to deliver oxygen. So, CO2 is essential. We've done this for more

than a 120 years, that that balance of CO2 is how we get oxygen, over-breathing will not increase the oxygenation in your cells, okay? You are not delivering more oxygen to your muscles; you cannot burn more fat by over-breathing. The opposite is true, which is by why this breath restriction is becoming so huge for fat-burning and for muscle building, which is what these "altitude masks" are. They don't simulate altitude, people. You have to go to altitude to simulate being in an altitude environment, what they do is they increase your tolerance for CO2 and more...

There's a reason why you wear them you're like, "I'm getting really hot right now, man, I'm just feeling the blood flow," and that is that increase of CO2. So that study you shared with me was fascinating, and it was fascinating that they were just looking at pregnant women because pregnant women need about 20% more oxygen, 20% more air, and the closer you are to delivering... When you're in your third trimester, you need to breathe really, really efficiently, which is why pregnant women are so often have hypertension, because their breathing gets so out of whack, which is why Lamaze breathing, which was developed... What? In the '50s or '60s, was so big. What is Lamaze breathing? Slow, fluid, easy breaths. So, it would be interesting to take those same women, teach them for five minutes how to breathe properly, and then look at their CO2 and look at their oxygenation, because in the studies that I've found, there is no impact on SpO2 when you're wearing a mask and they've done studies with seniors, they've done studies with doctors.

Surgeons wear these things all day long for decades, and oftentimes they put on SpO2 monitors and their 02 isn't going down, but I think the problem here again, isn't so much the physical part, it's what people do mentally. How they react to mask wearing, and the fact that there's no education around this is criminal. It really is that a cotton mask on an airplane is considered the same as an N9... As a doctor wearing an N95 and how we're only looking at that when we're assessing someone's risk for Coronavirus, we're not looking at their health, we're not looking at Vitamin D levels. New York found that 95% of the people afflicted with severe COVID had underlying conditions. And so, you've really got me on the soapbox here, but it seems like this is the problem with our culture is we get so myopic looking at only one thing without looking at the whole picture, and this is what I love about your show and your books is you're looking at the whole picture. Breathing is a side of this, airborne pathogens are a part of this, but it's not the whole picture.

SHAWN STEVENSON: This is so great, and this is what it's really about is, for us right now, we have an opportunity to be better, to address our underlying susceptibility. You mentioned earlier, your family member, for example, and being very adamant, wearing the protective gear, and I think I might have sent this over to you as well, and this is published on the CDC site, but most folks have no idea about this, of all vocations, our healthcare workers were hit the hardest, if we just go literally, the demographic. And it would be obvious, they're on the

front lines, they're there being heroes, putting themselves in the face of this thing to serve. But what folks don't realize, and they go to CDC site and they see this, nine out of 10 of our healthcare workers hospitalized with SARS-CoV-2 had at least one pre-existing chronic disease. It's not two out of 10 like, "Oh, this is interesting," or 50... You know, 50%. It's not even five out of 10 like, "Oh, that's... " It's nine out of 10 and about 75% of these folks were clinically obese. And so, we have to address, okay, even with the best PPE, if we have an underlying susceptibility, what's going to happen?

And so, you just mentioned this like we haven't really had much of a well-thought-out healthy conversation as a culture about being a healthier society, which right now, you know this, we're really, in many ways, the sickest nation in the history of humanity, in many ways, but self-inflicted. This isn't some the Black Plague coming through and taking us out, we're taking ourselves out. A part of that, of course, is the abnormal way that we eat, but also the abnormal way that we breathe, and this is why your work is so paramount right now, it is so powerful, and this is the key. It's free! It's free! The air is free as of now, unless you've seen Spaceballs, they started selling that stuff, they started selling oxygen. So, this is so remarkable, and I'm so grateful to have you on, and I've got a final question for you, and I'm interested to hear your answer.

For you in this experience, writing this book, the experimentation, the research, all the conversations and interviews, and then the post-experience with talking about the book, with more information and interviews and all these different things, what for you has really been something impactful over the past few years that has just changed the way you think about things, what is the thing that really stands out the most? Is there a particular story, is it a particular person, researcher, is it a particular practice? What for you has just really stood out as something that has just changed you for the rest of your life?

JAMES NESTOR: There's just so many, and I know that that's a cliché'd answer, but it's really true is I'm lucky enough to be in a profession where my job is to go and ask people questions, and to soak in information and to try not to have an opinion about it. I want to be a sieve, I want to be a filter, I just want to understand this stuff and then cook it down into something that I believe is honest and makes sense. So, a recent story, because these are always the ones that get to me, really, really got to me, and it is just an echo of what I've heard now, hundreds of times, it's... A dad wrote me whose kid was having a lot of problems in school, he was 9 years old, he was 9 or 10 years old, still wetting his bed, ADHD, on Ritalin, on a bunch of different drugs, been on all these drugs for years and years, not getting any better, in fact, getting worse, bags under his eyes, didn't know what to do, 12 different doctors. He taught his kid how to breathe, he taught his kid how to keep his mouth shut at night, recorded his sleep, and found that he had not only sleep apnea, but was snoring throughout the entire night.

There wasn't a time when this kid wasn't snoring and had been doing this probably since infancy, and everyone had told him that it was fine, and it was normal. So, within a single night, he went from snoring the entire night to zero, to zero snoring by closing his kid's mouth and his kid wanting to have his mouth closed, and all of those symptoms started to disappear. Because we know ADHD is directly linked to sleep disorder breathing, it's not a peripheral connection, it is directly linked. And the fact that these kids are still being treated with the same drugs over and over, and it's not doing any good is tragic, but with information comes power, and so that is what really thrills me the most and makes me want to get this message out to people is, this is something that is free, okay? And this is not my opinion, this is an accumulation of data and research from leaders in the field at some of the top institutions. It's all scientifically validated and it's available for everyone.

SHAWN STEVENSON: Wow, these stories have just been pouring in, obviously, I shared a story with you that we experienced. Your publisher sent a copy months and months ago, I don't know what happened to it, so we were out at Target, decided to... Let me grab a copy, this beautiful book right here, I'm going to show everybody was sitting right there on the shelf. And I was like, "Let me grab a copy here," and as we were at the checkout line, there was a woman in front of my wife who saw the book and she said, "Prepare to have your life changed," when she saw this book, and I was just like, "Woah," like some... A breath blew on me from the ethers, like, "Woah, that's really powerful." And she meant that. She really did. So, you're changing a lot of folks' lives with something that is very simple and practical, but also so much incredible science. Also in the book, you go into how it impacts athletic performance and so many other domains, so highly encourage folks to pick up a copy today of "Breath" by the incredible James Nestor. James, thank you so much for coming on and hanging out with us today. It's been amazing.

JAMES NESTOR: Thank you very much for having me.

SHAWN STEVENSON: Awesome. James Nestor everybody. Our breathing has major impacts on our cardiovascular system, our endocrine function, our nervous system, and even our metabolism. Breathing is the primary avenue that our body actually eliminates fat from our system. Listen to this, a study that was published in the peer-reviewed journal, the BMJ, had scientists tracking the path of fat as it leaves our system. Now it's important to understand that our fat cells are packed with contents in the form of triglycerides. So, this is what we think about when we think in terms of "burning fat", we're trying to burn through these triglycerides, which are three fatty acids combined with a glycerol, but these need to be broken down so they can be used by our mitochondria. Now, triglycerides are comprised of three types of atoms, carbon, hydrogen and oxygen, and triglycerides can only be broken down through the process of oxidation into these atoms.

But these researchers wanted to track the path of these atoms as they're leaving the body. They discovered that when 10 kilograms of body fat is oxidized, 8.4 kilograms of that fat is excreted from our body via carbon dioxide, via the lungs, while just 1.6 kilograms was released as water. So in essence, 84% of the fat that we "burn", how it leaves our body is through the eliminatory organ that is often overlooked, which is our lungs. Our lungs are also an eliminatory organ helping to eliminate carbon dioxide and eliminate burned body fat.

So, 84% of the fat that we lose is through breathing, through our lungs, and about 16% of that is through the fluids that we produce. We tend to think of the fluids as that's when we're burning fat and losing weight, when we see the sweat pouring but we're losing a little bit through that medium, even when we cry, we're letting go of some oxidized fat. But urine, sweat, tears, we're eliminating 16% of the fat that we burn through those mediums, but 84% through breathing. This is how important and powerful breathing is because often this is so... It seems like this mystical process when we "lose weight", where does it go? Where does the weight go? How does it leave our bodies? Well, it's primarily through breathing. Now, does this mean that if we simply breath faster, we're going to eliminate more weight? Eliminate more fat? No, that's not how it works. We need all the precursor processes to take place so that it can get to that oxidation, the mitochondria, and being able to be burned and eliminated from our system. We need all the precursor processes, but as James mentioned today, it's actually through slowing our breathing down, being more intentional about our breathing, breathing deeper, breathing more purposeful, really helping to exercise, what's known as our second heart, our diaphragm, and maximizing the metabolic benefits.

Really helping to improve our cardiovascular performance, improve our circulation, improve the production of nitric oxide, which has impacts in exercise and performance, and metabolism as well, incredible benefits there, simply by improving the way that we breathe. So, there's so much incredible information here, so make sure to check out James' book, "Breath", New York Times Bestseller, incredible, important book to add to your library. And one of the things we mentioned towards the end was this new phenomenon in our culture of wearing a mask, and what are the implications there? How does this affect our breathing, and one of the bigger issues is the unintentional nature that we're coming into it with already, being unaware of how to breathe properly, and that potentially being exacerbated. And we can get into discussions about oxygen and carbon dioxide and these different things, but most importantly for me it's always what are the results? What are the results in real people in the real world?

And one of the things that we see... And this is published in the BMJ, and we'll put this up on the screen for everybody to see on the YouTube version. In the BMJ, they found that health care workers now proactively wearing their mask for their entire shifts, we've seen an uptick in de novo headaches, about 51% of healthcare workers are experiencing this, and what that means is new onset headaches by implementing the mask, 51% of folks are now experiencing

headaches. And the question is why, what's going on with our biochemistry that's leading to this abnormal side effect, because the headache is a signal that something is off here, something is wrong. And if you're going to have this practice of wearing a mask, how can we help to buffer the situation or is the mask necessary in the first place? And there's so much science that we need to analyze and look at, where is the cost-benefit analysis, where are we hurting ourselves versus any benefit that we might see. And so, these are all things to expand and have a bigger conversation.

Another really interesting study... And this was published in the Annals of Work Exposures and Health, detailed that the highly thermo-sensitive nature of the human face and breathing pathways can easily be inhibited with a mask leading to increased anxiety, elevated stress hormones, false suffocation alarm in the central nervous system and panic attacks. And so, where are these things coming from? They're coming from a shift in our breathing. So, all of these things matter, you matter, taking all of this information into consideration and most importantly, being empowered in our ability to breathe. It is our birthright and it's something that we can have control over regardless of our circumstance, regardless of what might be on our face or what might not be on our face, this is something to put some intention into, because there are so many health benefits or health detractors when we're not breathing and utilizing this amazing capacity we have within our bodies, and as he details in the book, we have the ability to literally improve and strengthen and even grow these internal organs by giving them this exercise with proper breathing. So much to explore here. And we've got so much opportunity for us to get better, to become better as a society, to become stronger, to become more robust, to decrease our susceptibility to all manner of chronic and infectious diseases, but it starts with us, and it starts with us being empowered.

We've got some incredible powerful shows coming your way very soon, so make sure to stay tuned. Take care, have an amazing day, and I'll talk with you soon.

And for more after the show, make sure to head over to themodelhealthshow.com. That's where you can find all of the show notes, you can find transcriptions, videos for each episode, and if you got a comment, you can leave me a comment there as well. And please make sure to head over to iTunes and leave us a rating to let everybody know that the show is awesome, and I appreciate that so much. And take care, I promise to keep giving you more powerful, empowering great content to help you transform your life. Thanks for tuning in.