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SPEAKER:

Perfect alignment? Reaching far beyond your toes? The beauty of yoga is that it is much more of a sequence. Yoga is awesome. And also, activism.

SPEAKER:

(Speaks alternative language)

SPEAKER:

Yoga is about the quiet, internal journey. And a growing powerful voice. Yoga is action. Curiosity. Empathy.

Join us, as we celebrate yoga. The diversity of millions practising. And the power it gives us all.

Because we are all for yoga. And yoga is all for us.

(Video stops)

DR SAT BIR SINGH KHALSA:

Welcome everyone to this Yoga Alliance webinar session.

You will see, soon on your screen, a poll. We ask you to complete that so that we get a sense of the breath of our audience.

And this webinar is for CE credit.

And the topic of this webinar today is Scientific Research on Yoga and Meditation: The Relaxation Response.

The Relaxation Response is a technique and experience that we have when we meditate. So, it is a specific style of meditation that we will be addressing specifically in this webinar.

My name is Sat Bir Singh Khalsa. I am serving as the director of yoga research for the Yoga Alliance. I'm also an associate Professor of medicine at Harvard Medical School. I also serve as the editor-in-chief of the International Journal of Yoga Therapy. I coordinate the symposium on yoga research that is held by the (Name).

We are joined today by two guest speakers, guest participants, guest experts.

The first one, you will hear from them after I give some introductory remarks: John Denninger. He serves as the director of research and clinical training at the Benson-Henry Institute for mind-body medicine at Massachusetts General Hospital, or MGH, which is a Harvard affiliate Hospital. He also

mentors psychiatry students. He works with veterans struggling with the invisible wounds of war. And is the recipient of the Harvard Medical School of student award for teaching. As a Harvard medical research faculty, Doctor Denninger's work focuses on meditation and related practices, stress reduction techniques and resiliency enhancement approaches. Ultimately, he wants to understand how approaches like this are able to promote wellness and able flourishing and diverse groups of people.

Following Doctor Denninger's presentation, we will be joined by another guest expert, and this is Indu Arora, who considers herself a lifetime student of yoga. She has practised intensively in the creative yoga and (Name) yoga, and cashmere (Name) lineages. As a teacher of the last two decades, worldwide, her unique gift is making the teachings accessible to learners as well as advanced practitioners. Her core philosophies is that yoga is work in not work out.

So, during this webinar, we invite you to put any questions you have into the Q & A box and we will try to address as many of those questions as we can after the program. The format of the program is that I will give about 10 minutes of opening remarks with respect to setting the stage for meditation. Doctor Denninger will talk about the science behind Relaxation Response and technique. An Indu Arora will give a presentation about the practical application of meditation. And we will follow up with a Q&A session.

Without further ado, I would like to go ahead and set the stage for the whole session on meditation.

I need to share my screen.

When we are talking about meditation, with respect to yoga, it is one of the major components of the yoga practice. If you think about the four basic elements: posture, exercises, relaxation and meditation.

And for those who are scholars or academics, really recognize that meditation is really very important — and perhaps the most important component of traditional yoga practice.

My favourite definition of meditation is that it is a relaxed, non-analytical, nonjudgmental, focused attention that include disengagement from habitual mind wandering and ruminating thoughts.

It is a form of concentration, but it is a concentrated, and non-analytical concentration.

Meditation goes back thousands of years. There is suggested evidence that the (Name) evidence in the (Name) Valley were perhaps engaged in this practice, as you can see in this archaeological artifact.

It was codified and described, practically, in the Upanishads, which, in my mind, is the first real definition of agitation. "This mind of mine is extremely restless. The mind wanders among objects is a monkey does from tree to tree. But the man was a discriminating intellect as his driver and a controlled mind is the reins, reaches the end of the path — that supreme state of Vishnu."

There is this idea that there is a benefit to be able to restrain parts to focus attention.

And, of course, meditation was described by (Name). He describes this as a yoga is the stilling of the fluctuations of the mind. Buddha went on to say "do not dwell in the past, do not dream of the future, concentrate the mind of the present moment."

The Buddha went further to really talk about the consequences of meditative actions. "We are shaped by our thoughts, we become what we think. Your worst enemy cannot harm you as much as your own unguarded thoughts."

There is a lot to be said for the idea of self-regulation of thought process.

Now, there are three major categories of meditation. We have single focus, which is a single target. Types of meditation included here, typically, this is mostly done in yoga: mantra meditation, transcendental meditation, Relaxation Response, breath focus, Jesus prayer, chanting.

Aside from that, contrastingly that is an open focused, or mindfulness meditation in which the attention is regulated on the flow of sensation or thought itself. And practices here are (Name), the mindfulness-based production program, mindfulness as lived on a day-to-day basis.

And 1/3 category which is a catchall, which is guided meditation. Guided focus on thought process on a specific theme or content. This can include religious or spiritually motivated practices, lovingkindness meditation, guided imagery, autogenic training, (Name), body scan and some others.

Meditation came to the west and became popular. One of the popular decisions is when the Beatles started practising their transcendental meditation. It has grown popularity in the West. You can see this in the media. You can see this in Time, the National Geographic — this idea of studying meditation practices. The cover of Time Magazine, the science of meditation.

That popularity has extended into the media literature. There are many books on meditation practices.

One of the things about meditation is not only do you improve performance, but there is also a therapeutic aspect. There are many books on the whole aspect of yoga as a meditation therapeutic process. It is as healing.

And this is now coming into research. As you can see from our Harvard Mental School Publication Website, meditation in psychotherapy and the application of meditation for therapeutic purposes.

And here are more books on a specific. The whole idea of specific therapeutic aspects of meditation as a healing practice.

In terms of the prevalence of meditation, I think we have statistics in the US, particularly, about meditation practices. We have studies that compared the prevalence of yoga practice in the population

with that of meditation. And what you can see is that both yoga and meditation practices are increasing in popularity from 2012 to 2017. Changes that we see in the practice.

In terms of gender, the meditation is more evenly gendered than is yoga practice. But it tends to favour women, slightly.

In terms of age, there is a much wider disparity in terms of age within yoga. But within meditation, it is evenly balanced across age.

In terms of race and ethnicity, there is also a predominance of non-Hispanic whites, less so in meditation than in yoga.

And a recent study looked at the types of meditation practices across the US adults and what you can see here is the types of meditation with the different prevalences. Spiritual meditation and yoga — (Name) was 5% of the population. You can also look at specific practices. And again, many people actually practising a number of different meditation practices these days. A majority practising one, but some are actually practising multiple styles.

In terms of benefits, whether it is mantra, lifeless or spiritual, there are benefits that people experience in terms of feelings, sleep, improved relationships, health problems, reduced stress, etc. All of these are self-reported improvements.

So, come into the field of meditation research, this has been ongoing for many decades now. This is an older book that summarizes the research that was done in 1931 to 1996. It was a landmark publication.

Now, we are seeing recent publications. This was a paper on the impact of meditation on attention and emotion.

The growth of meditation and mindfulness research is astounding. This is from the pub med government index citations. And what you can see is the growth of the number of review papers and meta-analysis, growing exponentially over the past few decades. There is a dramatic increase in growth and research of meditation.

Going back historically, some of the earlier work talks about what was happening in the central nervous system, EEG study showing that during the deepest phase of meditation, these yoga practitioners were experiencing real brainwave changes. Suggesting central nervous system practices.

In this was advance practitioners and the conclusion of the study was that physiologically, yogic meditation represents deep relaxation of the autonomic nervous system. It's just the ability of self regulation of internal state with these practices.

In more recent studies now, looking at neural imaging, comparing non-meditators to meditators. We

are starting to understand which brain structures are being activated during meditation.

We are also seeing changes in brain structure. This work by (Name) showing that indeed, after eight weeks of meditation practices, it is possible to actually measure structural changes in the brain to these meditation type practices.

And then, the whole idea of mind wandering is interesting because everyone who meditates, experiences intrusions of mind wandering — this study by Harvard reiterated that and showed that people were less happy when their minds were wandering. It suggests that restraining thoughts in the act of meditation actually can improve stress and emotion regulation.

And we are seeing imaging studies of meditators in the scanner and we are seeing that during meditation, during the focus base, we are activating the dorsolateral prefrontal cortex, which is the (indiscernible). And we are starting to understand the neurophysiology of these different brain regions and how meditation works in the brain.

And fitting into a model that we use for yoga, and in all of the traditional components of yoga practice, meditation is capable of making effects on all the different aspects of what we experience when we practice yoga. It works on the physical level, it works on self-regulation — particularly stress and motion. It definitely increases mind body awareness, or mindfulness. Over time, it can lead to changes in spirituality through the induction of these meditative states.

So, just to close with a pitch for our Yoga Alliance research page, here, we have a number of research videos and webinars. And actually, a curated collection of many of the different scientific reprints that are available to teachers and practitioners. This is all open access to anyone that wants to access it.

Mark, I will turn it over to our first guest speaker, Doctor John Denninger and ask him to present on the science on research on relaxation.

DR JOHN DENNINGER:

Thank you Sat Bir, it is a delight being here. Give me one second to share my screen.

Does that look good to everybody? Yes?

SPEAKER:

Looks great.

DR JOHN DENNINGER:

Fantastic.

Welcome everybody, so glad you could be here today. I'm Doctor John Denninger. I am at (indiscernible), as Sat Bir said. I'm a director of research and clinical training. I will be talking about some of the science behind the Relaxation Response and more specifically, about how this all fits together in terms of the biology of this kind of practices.

I would like to start off by telling a quick story about — there we go.

So, in 2019 — and you may have heard of this man — there was a jogger. He was jogging in Colorado come up in the mountains, and he was essentially attacked by a mountain lion. It was not a fully grown mountain lion, lucky for him, a large adolescent. He managed to fight it out and kill it with his bare hands.

As I like to point out, this was a stress response. You are attacked by a predator, you have to escape the predator, and your body just pulls out all of the stops to allow you to survive. That is critical, it is key, it is something throughout human history and the history of all creatures on this earth. Survival has been the thing that has allowed us to still be here. So, that is incredibly important.

The problem is, for the most part, these days, we do not get attacked by mountain lions.

So, what we get attacked by nowadays is stress. Things that elicit the stress response, the fight or flight response, over and over again. For the most part, they are not physical dangers. There are still physical dangers, of course, but many other things that we encounter are not actually physical dangers.

For example, if you get a nasty text from a friend or a spouse, or a boss, or something like that, you are really in no danger — they are literally across the country. You are in no physical danger. But you may still have a physical response. We are exposed to bad news — like, horrible things, happening all over the world instantaneously.

So, we are under levels of chronic stress, probably, never before experienced by humans, and history. At least, during relatively peaceful times.

What is that do? Chronic stress causes wear-and-tear for the body. It was first popularized by (Name), called (Name). The bottom line is that the (Name) load can cause or worsen many different kinds of illnesses.

Our founder, who passed away, sadly, just a few months ago — always used to talk about how 60 to 90% of all visits to doctors involved illnesses that are either caused by stress. So, this is a huge problem. High levels of stress lead to high levels of (indiscernible).

This contributes to illnesses that are what we call noncommunicable diseases. Things like cardiovascular diseases, psychiatric disorders. It is interesting because in many of those illnesses, inappropriate information plays a critical role.

So, inflammation (indiscernible) getting out of hand in the body, something that I'm sure you thought about a little bit.

We will be talking about that with some examples in the end.

We talk about noncommunicable diseases, we have been talking about them, pretty much exclusively, before the pandemic started. Those seem to be the big, bad things that were on the menu for this coming century. Of course, communicable diseases seem to be a problem as well. We have the pandemic — most people are aware of this.

Perhaps, 30 years ago, in the early 90s, Sheldon Cohen, here at the Harvard Medical School, did a study of viruses. He was specifically studying the cold virus. As people will notice, there was a lot of strains he looked at, including a distant relative of the current pandemic virus.

What he did is that he showed if you measured peoples levels of stress, which is shown in the X axis here, and then, intentionally infected them with viruses — like the cold virus — the level of stress, the higher level of stress, the more likely they will get sick with the virus that you put in their nose.

So, stress can also play a big role in our reaction to viruses, which is very ironic during this pandemic, which is both highly stressful and (indiscernible).

Luckily, humanity has been working on this problem for a long time — how to cope with stress. And practices like meditation and yoga have been around for millennia, in a way that human beings found so many things that were assisting our wellness and health over the millennia before.

And we are fortunate that we have someone like Doctor Herbert Benson, who is shown here, who was a champion for bringing those ancient practices into medicine. He was a champion at the time when frankly, medicine was not very open — especially Western medicine — not open to that kind of thing.

For those of you who are not heard the story: Herbert Benson was a cardiologist and he was working here at Harvard Medical School in a laboratory that was studying high blood pressure, hypertension. So, he was studying high blood pressure in the using of (indiscernible) model, via scanner. He was a behaviorist and he was using a behaviorist type model for studying monkeys.

Sat Bir talked about (Name), earlier, and some of his acolytes who were the transcendental meditation folks came to Doctor Benson when he was a young faculty member and they said, "listen, Doctor Benson, you are studying high blood pressure in monkeys. But you should be studying it in us. First of all, we are humans, and we can control our blood pressure with meditation. This quote and he said, "please get out of my office." Of course, Harvard Medical School professors did not talk about or do anything with meditation. This was something that was outside of the realm of Harvard Medical School professions were supposed to think about.

Fortunately, for all of us, they were persistent. And Doctor Benson ended up being a very open-minded person about this. No, he did insist that they come after hours when his colleagues did not see what they were doing.

So, what this led to was a series of important scientific discoveries that started to elucidate what happens, physically, to people's bodies when they meditate.

In the mid-70s, 1975, Doctor Benson published the book that is shown here, *The Relaxation Response*, where he attempted to popularize this idea. To make it clear to everyone that as an antidote to the stress that people feel, and the health impacts of that, they could use meditative techniques — basically, the Relaxation Response. It was based on transcendental agitation and (Name) meditation. And they could use that to help with their health.

What is the Relaxation Response?

It is a state that is elicited by many different practices, including yoga, meditation, tai chi.

In many ways, Herb and I talked about these specific titles of Relaxation Response's. I do not love it because the word relaxation can distract people, or confuse people. Some people think it is relaxing, like cracking a beer, sitting in front of a game, something like that. Which is definitely not what this is. But Herb used this term because he needed something that would be probably appealing to the American public at that time. And meditation was not something that was probably (indiscernible) at that point. Luckily, it has become much more so.

So, the Relaxation Response is a state that is opposite to the stress response. It is accompanied by physiological changes, like blood pressure, heart rate, breathing. Increases exhaled mattress oxide. And bottom line, you can contrast the stress response and the Relaxation Response in this way: the stress response is involuntary. It happens as a reflex. He did not say, "I will trigger my stress response."

The Relaxation Response asks you to intentionally elicit it, using practices like meditation, for example.

These states lead to two different responses. (Indiscernible) they play a role in opposite directions, whether you are in the stress response or Relaxation Response, leading to very different outcomes.

Increase oxygen consumption, increased blood pressure, increased heart rate, if you are in the stress response. And decreased heart rate, decreased blood pressure, decrease oxygen consumption if you are in the Relaxation Response.

Here at the Benson-Henry Institute, we have a program called the SMART, I will sometimes refer to it as the (indiscernible).

In this program, we teach people to elicit the Relaxation Response using a number of different kinds of practices, including yoga, a canonical technique which is single-point focused meditation. It is a multimodal program which includes other components, including stress awareness, promoting social connectedness, healthy lifestyle behaviours. It incorporates components of CBT, and positive psychology, and lifestyle modifications.

It is a fabulous program that has benefited many people — patients, and also others. We work with

colleagues, first responders, a number of different groups.

Whenever I am teaching this program, whenever I'm talking about meditation, one of the slides that I like to show is this one. This is originally data from a neuro- image study that references (indiscernible), but it was written by (Name) and his colleagues. It was written in 2014, which still reads very well. It's great for people if anybody is interested.

Sat Bir mentioned mind wandering. It allows people to see the cycle of what happened in the brain when people were meditating. And everyone, including expert practitioners — this study was based on expert practitioners — everybody has their mind wandering. When your mind wanders, it activates what is called a default mode network, you can see that in different parts of the brain. We do not need to get into the anatomy now.

But once mind wandering happens, the meditator, at some point — if it's me, it might take longer, if it is somebody who is practice, maybe faster — they become aware of that distraction. Then, they reorient that awareness and then, they enter a period of sustained focus.

So, it is that cycle that is important. It is not that — many people who have not meditated before that that you needed to spend all of their time here. They spent all of their time sitting there. In fact, that is not the case. Everybody goes through this cycle. As I like to say to people, it is like doing reps. Reps with the meditation muscle.

So, we have used this practice and the meditation practice and programs like the SMART program more broadly in different populations. I do not have time to talk about all of them, let's touch on some things here.

We worked with a group of patients from the community health centres at Massachusetts General Hospital runs in Boston. This is more of a diverse, less (indiscernible) population. And this was a study of 124 of those patients with depression. Depression or anxiety, or, sometimes, both. They were led through a program that was targeted for this population. The bottom line, the punchline is that in that group, there were significant decreases in depression, anxiety, and in perceived stress.

My colleague (Name), long before it was popular to deliver — now, it seems like it is all we deliver. Before, it was popular to deliver these programs over virtual spaces, she did a study in people with neurofibromatosis. For those who do not know, that is an incurable progressive illness of the nervous systems. Sometimes, they are characterized by tumors that grow all over your body. This is always characterized by pain, and disability.

She delivered this program in videoconferencing. The control program was a health education program.

And again, the punchline is that the people who employed the mind body practices, who elicited the Relaxation Response over the eight week program, they had greater improved physical and psychological quality of life — improvements that were sustained at six months.

My colleague James stall, a number of years ago now, did a retrospective study looking at database of everyone, almost 500 people who have been through the Benson-Henry Institute, gone through our programs. And he compared them to a control sample from our databases here at Mass General of 13,000 people. And he looked at how often people had to go to the doctor. Or, interacted with the healthcare system for anything. Like, surgery, doctor visits, laboratories, the kind of stuff.

And what he found is that people who were trained to elicit the Relaxation Response and are trained in these kinds of practices actually had a decrease compared to the control sample, the controlled database sample, of 43% of visits to doctors. Specifically, visits to emergency rooms decrease four times a year, to about two times a year. A pretty significant decrease for anyone (indiscernible) for anyone who is paying attention to how much health care costs us.

For me, more important, is that it actually demonstrates the people, through self-care, are able to keep themselves more healthy. And they need doctors less. Even as a doctor, that is something that I like to see.

One exciting thing that I wanted to talk about a little bit — I did not want to bore anyone. I do not want to bore anyone with the details of the biology here.

But just to stay, I will start with the punchline which is that mind-body practice, elicitation of the Relaxation Response's, have been shown in other types of practices like yoga, they are able to regulate how genes are turned on and off. Just really briefly, I will remind everyone that we all have — all of our genes are in the middle of ourselves, they exist in nucleus cells. But ourselves do not need all of the genes. Like, deliver does not need the same genes as the neuro- cell or the bones do.

One of the things that cells do to use the genes that they need is that they alter gene expression. That means they essentially only turn on the genes that they need to be the cells that they are or to do the functions that they need to do.

So, by looking at how genes are turned on and off, you can understand the effects on the entire body of practices like eliciting the Relaxation Response.

I will point out two things because they are exciting: we have been able to show enhanced expression of genes for people who are eliciting the Relaxation Response phase for years, or even people who have been doing it for eight years, that they have increased expression of genes associated with telomere maintenance, which shorten when you are stressed, and this suggest that these practices can enliven them, which have implications for lifespan. And the other one that I will talk about and I will hit unless a little bit in the end is the inflammatory response, which I mentioned in the beginning. We see reduced expression of genes linked in inflammatory responses in ways that are probably tamping down inappropriate information.

How did we figure this out? We did a study, a number of studies now. But this is the first one we did where we took long-term practitioners, from number of different practices, different meditation

practices, different yoga practices, repetitive prayer — and we compared them to a sample of people who had never done any of these practices at all. We had taken these people who would never take these practices and we trained them to elicit the Relaxation Response and had them do that for eight weeks.

And at each of these points, we drew blood and we extracted the RNA — like the RNA that is in the coronavirus, but not specifically that. This enabled us to look at all of the different genes and see which ones were turned on and off.

For the most part, in the things that I'm showing, this is a heat map where lower expression is red and higher expression is green.

So, the exciting findings is that we saw there was a difference between the long-term practitioners and the novices at the beginning, before we trained them in what genes were expressed. That is pretty exciting in and of itself.

We were also able to show that with the novices, there was an increase in their — in certain genes, there were changes in certain genes from one they had no training, even after eight weeks of training. There was a difference in the pattern of genes and how they were turned on and off.

And then, finally, we were able to show that there was a similar changes in gene expression profiles, which genes were turned on and off, and the meditators — the long-term practitioners — versus the novices. And the novices versus themselves, before they started. Novices after training and novices before they started training for very exciting stuff.

This has led to an explosion in the field. Thinking about the biology of how these practices work.

I will quickly talk about two studies. One is for people that we did with inflammatory bowel disease, they are diseases like Crohn's disease, and colitis, where you have high levels of inappropriate inflammation in the colon, which can lead to big problems.

People were delivered a program that was based on relaxation responses, that was overall, a 10 week program. And then we did a three week follow-up after that.

On the clinical side, the folks with inflammatory bowel disease had an improved quality of life over the course of this program. That's great.

But even more exciting for us is that we were able to show some changes in information. So, IBD is an inflammatory disease, and we were able to see down regulation — and I will not get into the details just to spare you. But down regulation in genes and inflammatory processes that are normally regulated.

This is an exciting study, but it is showing the underlying biology.

This is getting back to the roots of the Benson-Henry Institute. As I mentioned, Doctor Benson was a cardiologist studied hypertension when he started all of this. This was a study of genomic changes in a group of people with hypertension. So, what we were able to do is take — I will switch slides. We were able to recruit patients with stage I hypertension — some of whom were on medications, but our doctors told us that they were OK if they were off of them — and others who are off of them.

We were tapering people on and off them. This is just stage I hypertension.

Event, we gave them an eight week program, very similar to the SMART program, that was teaching them to elicit the Relaxation Response and have the news that canonical meditative technique every day, for eight weeks.

We then looked at their gene expression. So, we looked at how genes were turned on and off, as well, of course, is looking at whether their blood pressure changed.

So, what we did was that we compared the response — these are people whose blood pressure went from being too high, who went down to normal levels. We had very rigorous definition for what response was. And then, we compared them to nonresponders, people who do not get that. The group was split 50-50. It was just by this eight week program, half of the people in this group were able to lower their blood pressure and no longer needed medication.

Critical, in and of itself.

But even cooler was that we saw, between the responders and nonresponders, almost 1800 genes that were differentiated by regulation. The pattern of how genes were turned on and off were different from responders than nonresponders. One of the key things in there was regulation of pathways that control information. So, immune pathways that control information. A key molecule, which you do not need to know about but I will say, his molecule called NF-kB. It is a central switch from the immune system.

Even in illnesses like hypertension which have an inflammatory component that can lead to things like more severe cardiovascular diseases, practices like these may be able to ship things so that the body is no longer essentially attacking itself. Very exciting stuff.

It's time for me to wrap up.

So, very quickly: the stress response necessary for survival but does not do us any favours and the kinds of stresses that we face in the modern world. Usually. Unless you are attacked by a mountain lion.

Chronic stress is something that has clear negative impact on health, from cardiovascular disease to depression. But even in viral innocence like the Corona pandemic.

The Relaxation Response regularly elicited, if you meditate, use other things like yoga to elicit the

Relaxation Response — it can serve as an antidote to chronic stress.

The Relaxation Response can decrease symptoms and lower utilization in illnesses caused or worsened by stress.

Gene expression studies can demonstrate how Relaxation Response can decrease inappropriate information in disorders as diverse as inflammatory bowel disease and hypertension.

That's it for me.

DR SAT BIR SINGH KHALSA:

Thank you for that John, for that exhausted and detailed description of the research on the Relaxation Response related to practices and their therapeutic applications. Of course, the whole citations are there, so for those of you who are experts can go off and find those citations. For others, there is a test under this!

Now, we transition to Indu Arora. I will ask that you give us about 10 minutes of time and talk about the practical application of these types of single-point focused meditation practices. Indu, please go ahead.

INDU ARORA:

Thank you so much Sat Bir, John, and Yoga Alliance for having me. Very good morning and good day to each one of you who are joining now, or will be watching it later.

We have established this connection between single-point focus and relaxation response was not what I'm going to do is connect it to yoga practices and yogic texts.

, According to (Name) sutras, in chapter number two, it clearly states that actually, the point of focus can be anything that we would like, anything that is pleasing to us. Anything that is pleasant. Anything that we have a natural disposition for.

Not just that, (Name) tax, is actually one of the main tanks that talk about 112 different (Name). See, I'm using the term (Name) because the single-point focus, the term for that in yoga sutras, is called a (Name) not (Name).

I loved it when Doctor John mentioned that it is a state, it is a response. I would like to say, it is a consequence, meditation is a consequence of sustained and pleasant single-point awareness or focus.

These two things are important. The ability to focus at one point — and we will talk about it — combined with uninterrupted stream by the method of repetition. These are very important. And these two things are talked about, those of you who are word nerds and geeks about different text like me, check the chapter 3 of your sutras, sutra number one and two.

So, this is important. Now, let's come to the point — literally — what can be the focal point?

As I mentioned, these two texts, they talk about 112 different (Name), or concentration methods.

It potentially talks about breath, Om, exhalation, awareness of the heart, and talks about that you can choose whatever you would like your focal point to be.

But with my limited awareness and experience, it has categorized this into what all of these could be. The single point of awareness could be visual. Which means, it can be a point that you visualize outside, or inside. It could be a flame. It could be a (Name), a geometric pattern. Mandela, externally, or it could be a chakra within the body.

So, we have to pay attention of what kind of stimulus what comes naturally to us. We do not have to fight to concentrate, it is so important that nothing is basic or advanced. What is important is what catches your attentions effortlessly. We do not want to misuse, under use that energy. After all, the definition of yoga is that which is a skilful action.

So, how can we skilfully concentrate?

So, visual or auditory — which means it can be a mantra, either listening to it or mentally repeating it. Or, award, or a phrase, or even focusing on the heartbeat. Or, focusing on a number. Inhale 1, Exhale 2.

It can be tactile, the touch of the breath. Or, for some of us, who use (Name), the chanting beads, it can be the touch of it.

So, there are so many different ways and things that we can choose from. It could also be something related to fragrance or related to taste.

Is it more of a distraction or is it something that pulls me in to a state of focused focus?

To a state of focused, combined with ease.

Because we know, at times, when we hear these words, pay attention or listen carefully. We curl our ears forward. Or, if someone asks, "watch carefully!" We squint our eyes and pull forward lesser is it really attention or attention combined with tension? This is a very important point to keep in mind. It is attention combined with effortlessness, or comparative ease or pleasantness.

It can also be a thought, like "I am (Name)."

As John and Sat Bir talked about, there can be wandering minds. What is that? It can be that we are picking up something in our visual feed or auditory feed that we (indiscernible), all of these things, when they catch our attention, they kind of relive our mind in a different story.

Even before (Name) comes in (Name), which means, we are drawing the senses to a focal point.

This is important. So, choose a focal point that is not distracting for you, that is calming for you. And know that there are so many choices.

Now that you have chosen the focal point, there are three steps, with my limited awareness.

Number one, ease with the posture. Whatever posture you choose, upright posture with or without support, let there be ease. If I have to describe ease, I would have to say it in two ways: ease in the limbs, and ease in facial expressions. Of course, there is different levels of deeper relaxation, but as a starting point, this is good enough. Ease, one is posture — alertness, as if you are about to stand up, and you can maintain that with or without support. And second, ease in the limbs and ease in the facial expression. This is point number one.

Point number two, ease with your breath. We can call it diaphragmatic breath. Deep breath. But I like to think of it in terms of visual. Visualize your breath like a stream of oil. When you visualize that, the breath retains full qualities. You can remember this acronym QSEC.

When the breath attains these four qualities come automatically, that is (Name) come automatically, the sense comes back to the self. Now, comes the point to be on the point.

Step number three is focus with ease. Whatever focal point you have chosen, now, maintain the awareness of that and keep repeating it. Which means, uninterrupted stream. Now, it is normal that there is wandering, even though there is (Name). What we do with that? Yoga suggests three or four kinds of negations from the texts: (Name). Whenever there is description, mentally say it. Mind, (Name), (Name). Come back. Or, (Name).

If there is some kind of — when we weave ourselves into a story, we identify with that story, that is when we use (Name). "I am not this."

Or, when there is a sense of attachment to our practice, or a sense that you are doing this practice, then we can repeat this phrase, "(Name)." "I am not this."

So, (Speaks alternative language), (Speaks alternative language). You can use either of these three to come back to yourself and choose five minutes, 10 minutes. It does not even matter. What matters is that effortlessness, ease, and that focal point as a support and as an anchor to create this sense of absorption that is meditation, that is that Relaxation Response.

So, meditation is a state which is a consequence or response of single pointed focus that is concentration.

If you are something that is leading into meditation, then what is important is share from your experience. Do not share a technique that you have not practised yourself. It is very important to share with your experience and when we share with our experience, there is truthfulness in it. And when

there is truthfulness, there is power that is impact in what you are saying.

And boys plays an important role when we talk about guided meditation, or guided relaxation.

You cannot say to someone, "relax your toes," if your own toes are tense.

So, let there be that experiential transmission and allow space. When you are saying one instruction, know that the ear is listening, but it takes time for the body to embody it. Do not rush. And if you are a practitioner like myself, who is doing this practice for themselves, for working on themselves, then keep this simple rule in mind: (Speaks alternative language). One step at a time. Do not feel defeated, it is absolutely normal for the mind to wonder, but know that there are tools. It is not a practice that comes overnight. It takes time. (Speaks alternative language). One step at a time. (Speaks alternative language), As per your capacity.

And from my words, I would say, it is worth it. Or, something that I'm inspired by, Nike, "just do it."

I sincerely hope that this short presentation is helpful to you, is beneficial to you. You can choose whatever you like is the object of focus. Thank you very much.

DR SAT BIR SINGH KHALSA:

Thank you very much, Indu. We now have the opportunity to engage in some Q and A with our attendees.

Something that is important and popular, given that my yoga is looking at the efficacy, is from Nancy, who (indiscernible) "I've been teaching yoga and mindfulness as an elective for the last five years. Are there any studies or research around starting a practice early in life and the long-term benefits for the developing brain?"

I will first ask John and then Indu to respond to that.

DR JOHN DENNINGER:

I do not know that literature super well myself, but I will say that there is good evidence that in the short term, those kinds of practices are highly beneficial to students. I mean, (Name) has done some work with students at all levels. Up until high school and college. And we have seen a definite reduction in levels of stress. And also, some evidence of improvements like academic performance and the like.

I do not know, Sat Bir, do no longer term data the people are followed?

DR SAT BIR SINGH KHALSA:

It is none existent yet. There is both yoga teachings. What we really need is the funding to generate the long-term outcomes. The ideal study is to get these practices to our children and adolescents and followed them into adulthood to see the relative incidence of noncommunicable diseases like depression, anxiety, diabetes. That is what we really need.

Indu?

INDU ARORA:

I will say one thing, I feel stress is quite communicable. When you see tension, in one of the family members, you feel it. I mean, it is not communicable in terms of the rest of Western science, but I think it is quite communicable. We feel the stress around. Coming back to the point, I feel like there is a power in passive learning, even if you do not understand it.

I remember when I was young, I was in my father's lap when he used to meditate. I do not remember everything he did, but I feel like we are able to pull back, we are able to hone into those experiences and they definitely benefit us.

That is what I can speak for my personal experience stops

DR SAT BIR SINGH KHALSA:

Can you speak on the skill set that might be required to teach these kinds of practices to children and adolescents? Do you have experience with that?

INDU ARORA:

I think what is important is to keep it simple. I would go back to what (Name) says, choose whatever is pleasant.

So, whatever is pleasant to the kids — let's not choose things or words which are abstract, which are difficult for the children to connect with. So, for me, my suggestion would be keep it simple, keep it short.

What matters is even those 30 seconds of the ability for a child like mind to focus on one thing.

DR JOHN DENNINGER:

Can I say something? I had a very gratifying experience when my daughter's science teacher asked me to give a talk to the entire seventh grade class. I had given a couple of techniques, a couple of Relaxation Response, brief relaxations. I heard one of my daughters classmates had a test and before the test, he used the practices that I suggested and he went up to the teacher and said, "I did that thing that Grace's that talked about and it really worked!" So, I can be really wonderful for kids.

DR SAT BIR SINGH KHALSA:

We get those anecdotes, and kids come back and talk about the meditation and slow breathing. It just works for younger individuals.

Other questions about popular notes is from (Name). "Is there one particular type of meditation that shows more brain activity/growth, etc., than others?" In other words, my meditation is better than your meditation. Comments?

DR JOHN DENNINGER:

I will say, for the most part — this goes back to Doctor Benson. We have been less concerned about differences between different kinds of practices, and more concerned with commonalities.

I mean, clearly, you know, when you're doing different things with your brain, for example, things cannot be exactly the same. If you are doing a concentrate of type of practice versus an open awareness practice, things have to be different. But there are a lot of commonalities.

(Name) did a study comparing Relaxation Response and the single point focused technique to mindfulness. And there were some differences. But for my money, there were more commonalities than differences.

INDU ARORA:

I would agree. Since we are talking about this in context with yoga, I will say that we will come back to step number one of yoga: ahimsa, nonviolence.

Even though there is some benefit, in some way, to understand, but when it comes to practice, do whatever is pleasant.

And if, after a while, it is not pleasant anymore to use that focal point, change it. It is absolutely OK to change that focal point, to be something else.

What matters is what allows you to go there effortlessly. One of my teachers used to say, "there are 360° or ways to reach one point."

Note that while you are practising one, there are 359 others.

DR JOHN DENNINGER:

Is kind of like when you ask your doctor what the best type of exercise to do is for stopping and their answer is, "whichever one you will do."

DR SAT BIR SINGH KHALSA:

The engagement and practice is the most important thing. Different people will gravitate to different types of practices. Different strokes for different folks, if you will.

Another question that is popular here, tying into the stress response, from Patricia, "does the stress response equal inflammation?"

DR JOHN DENNINGER:

That is a good question. It is not equal inflammation. There is good evidence that — let me just something quickly. Inflammation is not always bad. Like, you get a cut on your hand, it gets inflamed, that is your body healing.

Inflammation is bad when it goes berserk. When it overreacts, when it does things we do not need.

The stress response, especially being chronically, can push toward inappropriate inflammation because it gets us ready for the kinds of things that we would face if we were in a battle. Like, literally, if we were being attacked by a mountain lion. The ones that you would get are much more important than the virus that you are fighting, at that point. So, it pushes you towards the information that fights bacteria — good in the short term, but not good in the long term. It is not equal to information, but it leads to inappropriate inflammation.

INDU ARORA:

My field is yoga, and (Name), and in my field it is called (Name).

When we are stressed for a long time, it increases that heat in the body. That movement, (Name), it is related to that stress was that when two things keep moving for a long time, it creates friction. That friction is called (Name). I will simply stick to my field, that is yoga, so, yes I would say stress, in that respect to the lands leads to inflammation.

DR SAT BIR SINGH KHALSA:

Just to reiterate what John was saying, I think short-term stress is very different than chronic stress. In short-term stress, the immune function is enhanced, inflammation is good and those are survival mechanisms. It is when you get into the chronic stress that you have problems with inflammation and degradation of the immune function.

Here is an important question that I think it's really important for yoga practices, from Kelly, "how often does one need to elicit the response for positive therapeutic results that Doctor Denninger describes? Every day? Three times a week? Once a week? Is more often better?"

DR JOHN DENNINGER:

That is an excellent question. So, here is what I want to say: we have evidence that gene expression, the pattern of how they are turned on and off, can change with practice. Or, let's say, recommended practice, of 20 minutes daily.

That is not a huge amount of time if you think about it. It is likely that people are not always forthright with us in studies when they report back what they are practising.

So, the amount of practice to actually do may be less.

Our general experience (indiscernible) the long-term study has been hard. Longer-term, consistent practice, tends to bring more benefits.

What we have not studied is whether longer periods of time in a given day brings more benefits. I would imagine that there would be some kind of asymptotic approach to some maximum benefit. But I think the most important thing is regular practice.

Just like the veterans say, I would rather tell the patients — I would rather date due 10 minutes a day,

than nothing. But if they can do 20 twice a day, even better.

INDU ARORA:

"Just do it." What is most important is build a habit out of it. Are there any markers? I will come back to the yoga. I used to say that the markers of a meditator are the three corners of the triangle, the top (Name). Contentment. That automatically, there comes a sense of contentment. Second, (Name). A sense of stillness. (Name), sense of silence.

The people who practice will move slowly to the centre of this triangle.

DR SAT BIR SINGH KHALSA:

Thank you.

Another question is from Brooke, "has there been any studies a meditation on autoimmune disease such as multiple sclerosis?"

DR JOHN DENNINGER:

So, in many ways, I talked about inflammatory bowel disease, they are essentially like autoimmune diseases like multiple sclerosis. I'm not aware of anything that has been done with multiple sclerosis, specifically.

But from a theoretical perspective, it seems — from the evidence that we have now — that practices like these could help to calm down some of the inappropriate inflammation, the immune system activity that you see in those illnesses.

That is an area of study that really needs to be further characterized. But there is a lot of hope there.

DR SAT BIR SINGH KHALSA:

Another question that is really important in a general way from Angelina, "how long is it the benefit of the Relaxation Response last? Is it sustainable once participants return to typical, busy workday and family life?"

DR JOHN DENNINGER:

That's a good question. I would say that the SMART program — I do want to mention that we have training programs. We have them for clinicians and for non-clinicians, for a very similar program. Programs like this definitely bring that benefited while people are in the program. The benefit continues after the program to the extent that people continue practising.

We always encourage people to keep practising. They do not always.

And we have shorter-term follow-up which you saw in some of the studies, like a matter of weeks or months, which suggest that many of the benefits are maintained that people continue practice. We think that benefits can be maintained longer term as peoples practice continues to build.

DR SAT BIR SINGH KHALSA:

Indu, your comments on the effects of practices?

INDU ARORA:

Ella come back to the triangle. But I feel there is a certain kind of calmness, which we move more from reactivity to responsiveness. We move towards a kind of sense of responsibility. For me, that ability to respond, that is the Takeaway of meditation.

Because the mind is wandering, it tends to be reactive. But when we are able to hone into that mind with the practices of meditation, it is single-point focus, choosing that, it allows us to have the space between reaction and gives us a sense of the ability to take a pause.

DR SAT BIR SINGH KHALSA:

Thank you. I think we will start to end here. I will ask, Indu, if you can take us through a one minute granting to close out our session today?

INDU ARORA:

Whatever is your body position, become aware of that.

Make any adjustments, as needed.

Draw your awareness from all corners and periphery of the body, to the centre. The midline.

Gaze at the midline, from the (indiscernible) to the crown. Coordinating it from the breath.

Ascending and descending.

And now, do this with the mantra, (Speaks alternative language).

With inhalation, and exhalation.

If the mind wanders, mentally say, (Speaks alternative language).

Let the mind rest at any one point that is pleasant, that feels natural in the midline.

Maintaining the awareness of that point, if the eyes are closed, slowly open them up.

Maintain the awareness of the breath and the mantra.

As you come back to this present moment.

DR SAT BIR SINGH KHALSA:

Thank you very much, Indu. That recess to the close of this webinar. I invite all of you to stay tuned for future webinars in which we will highlight some aspect of science and research on yoga related

practices.

I also invite you to access the research pages that we have on Yoga Alliance, as a resource for you to gain any further information.

Thank you all for participating and we hope to see you all again in the future webinar. Namaste.

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