



Benefits of Yoga with Harvard Researcher

Yoga is a practice that incorporates multiple components, multiple techniques that include not only the physical posture but also the physical exercise, the breathing techniques, the deep relaxation techniques and very importantly the contemplative side which is the meditation practice, the practice of mindfulness. Explaining the science behind yoga is Dr. Khalsa from Harvard Medical School.

Full Transcript:

Priya : Hello, everyone, and welcome to the Cure Panel Talk Show on yoga. I am Priya Menon, Scientific Media Editor, Cure Talk. On behalf of the Cure Talk, Cure Panel team of Sharib Khan and Chintan Patel, I welcome all of you this evening to a discussion on yoga. We will be moderating the call and bringing people live on the show. Cure Panel Talk Show is organized by Cure Talk, the blog of trialx.com, an online platform to connect patients to clinical trials of new treatments. For information on clinical trials for all conditions, please visit trialx.com/ask. This is the ninth episode of the Cure Panel Talk Show and the first Cure Panel discussion on yoga. Cure Panel Talk Show broadcasts have received over 32,000 replays till date. Today's yoga panel is co-hosted by co-founder of Trialx and yoga enthusiast, Sharib Khan. The expert on the show today is Dr. Satbir Khalsa from Harvard Medical School and he will be addressing the topic – Benefits of yoga for managing stress and lifestyle diseases. Dr. Khalsa, I welcome you to the Cure Panel Talk Show. On panel, we have Dashama, Char Grossman, Krishna Kaur, and Micheline Toussaint. On behalf of the Cure Panel Talk Show, I welcome all of you to this show. I will now read out a couple of rules which will make listening to the Cure Panel Talk Show broadcast smoother. If you are listening in to the panel through your phone as well as the computer, please mute or stop the online broadcast on your computer for better audio quality. Callers will be invited to ask questions at the end of the discussion. They can let us know by pressing 1 on their keypads and we will bring them online live. Sharib will now introduce us to the expert and the panelists. Sharib, you are on.

Sharib : Welcome, everybody, to the first Cure Panel on yoga. We are very excited to host this panel today. As Priya just mentioned, we have been doing these panels mostly inviting leading experts to discuss about myeloma, prostate cancer with a panel of patients and cancer survivors, but we are very excited about having started a series on yoga and we want to highlight the science of yoga and what we are learning about this ancient practice in the research labs of leading institutes in the country and to kick start the series, we have today, Dr. Khalsa from the Harvard Medical School. Dr. Khalsa is the Director of Research for the Kundalini Research Institute and also the Research Director for the Krupalu Center for Yoga and Health. He is also an Assistant Professor of Medicine at Harvard Medical School and at Rhythm and Rhythm Hospital. For over 10 years, he has been conducting research on the efficacy of yoga and meditation practices, including evaluation of yoga for insomnia, addiction, back pain, depression, anxiety disorder, posttraumatic stress disorder, chronic stress, and mental health in public schools. He has also practiced a yoga lifestyle for over 35 years as the Kundalini yoga instructor and did an elective course at Harvard Medical School in mind-body medicine. We couldn't have had a more profoundly experienced and knowledgeable expert to kick start the series and we very, very heartily welcome Dr. Khalsa on the show today. (Pause) Dr. Khalsa, you are on air and welcome to the Cure Panel Talk Show today.

Dr. Khalsa : Oh, thank you very much for that kind introduction and it is a pleasure to be on the show. So, I guess I am going to start here with about 10 to 15 minutes just to talk a little bit about yoga and yoga research. Right at the outset whenever you talk about yoga, I think the first thing you have to do is define what you mean by yoga. It has become so popular in the general public that it has come in many forms now, but when I talk about yoga and virtually when all yoga researchers talk about yoga, they are really talking about the traditional practice of yoga, not just as a physical exercise or a system of exercise but also as a contemplative practice. So, when we talk about yoga, what we are really saying is that this is a practice that



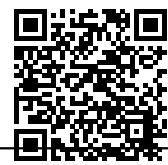
incorporates multiple components, multiple techniques that include not only the physical posture but also the physical exercise, the breathing techniques, the deep relaxation techniques and very importantly the contemplative side which is the meditation practice, the practice of mindfulness and focus of attention and many of us would actually argue that this meditation component of yoga practice is, in fact, perhaps one of the most important components of yoga practice.

Now, yoga has become, as I mentioned, very popular in the general public and I think some of the reasons for this is reflected in the reasons for practice, which includes not only general wellness and physical exercise but also very importantly many people practice yoga for the purpose of stress management, as a stress coping technique, and so these yoga practices are very beneficial for both the mind and the body and there is a lot of research that's demonstrated that and that has actually given rise to the use of yoga as a therapeutic intervention for a variety of psychological and medical conditions and so there is not only the popularity of yoga in the general public for wellness but also for so-called yoga therapy. In fact, if you look at the surveys, there is about 20 million people that are not actively practicing yoga in the general public and that recent survey conducted by the Yoga Journal also indicated that there was an additional 104 million people who were interested in practicing yoga.

In terms of yoga therapy, there was a survey that was done in 2007 by the Center For Disease Control which showed that 6% of the population is practicing yoga for therapy purposes and that was up 1% from a survey that was done five years before them. So, what we are really seeing is that yoga and yoga therapy are not only very popular but that that popularity is very rapidly growing and as we look into the reasons why this is the case, we start to look at what the research has shown us in terms of the benefits of yoga practice with the psychophysiological changes that take place when we are engaged in these practices and these are actually reviewed in a book that I had just recently published in January, published by Harvard Health Publications, the Harvard Medical School Guide, and the title of the book is Your Brain On Yoga and in that book I review a lot of the current evidence that really gives us information on the benefits of what we know about yoga practice and how that helps.

I am going to summarize these sort of mechanisms that we know from the research that tell us about what yoga does. Well, one of the prime areas of research is that in meditation research and we know that when you meditate what that really is the control of attention and when you control your attention on some kind of target like the breath or a mantra, you immediately gauge these networks in the brain called the attentional networks and these attentional networks are different than what's going on in the brain when you are ordinarily doing mind wandering, when you sort of emote, when your mind is offline and so called the default mode in your brain and so that's very different when you control your attention and as a consequence of that as you maintain attention, you start to reduce the amount of rumination and mind wandering that goes on and there's lot of dysfunctional thinking and lot of dysfunctional thoughts that occur actually in mind wandering. We are usually not thinking about how good we have it. We are usually thinking about problems that we have to face. Now that actually induces a psychophysiological response that Herbert Benson characterized as the relaxation response and this is actually a psychophysiological response in the mind and in the body that is the opposite of what we call the fight or flight response or the stress response. Its actually a rejuvenative response, a restorative response, where the stress hormones are reduced and the body goes into a recuperative, sort of even meditative mode, and that can be very beneficial because over the short term that will reduce stress response and over the long term it will actually lead to what we call resilience, the ability to manage and cope with stress more permanently and we actually have research that shows that there are structural changes in the brain. Your brain actually changes through plasticity that is known to exist in the brain. So, your brain becomes actually more meditative brain, capable of withstanding the stresses of life and that goes along with a reduction in the emotional reactivity within the brain. There are areas of the brain in the limbic system which are known to be involved in emotional regulation and emotional responses and those areas of the brain start to quiet down when you engage in this kind of contemplative practice.

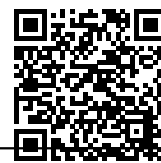
The other thing that happens with yoga practice is that there are other things such as mind-body effects, self-



efficacy, self-empowerment, the belief in what you are doing, the expectation of what you are doing and that engages other networks in the brain that are also beneficial for mental and physical health. Furthermore, as you engage more and more in these meditative practices, there are actually deeper changes that take place in the mind and in the brain. People start to change their relationship to their own lives, their own perception of who they are and where they are going. These are almost self-identity changes. Of course, there is also the changes in physical fitness, flexibility improves, endurance improves, respiratory function improves, and there may even be direct organ and tissue effects with specific yoga practices and then of course, there is also in yoga this idea of subtle energy changes, things like energy, subtle energy like prana that are affecting things like the chakra and the kundalini. We don't have evidence on these, but these may also be participating, but I think one of the most fundamental, the center of map I would say of the benefits of yoga really are in its ability to reduce stress and stress is virtually involved in the severity of virtually every mental and physical disorder and so reduction of stress can play a role in many different diseases by improving your regulation of stress as well as improving both your mental and physical fitness to bring your body back into balance and then there is also some evidence that suggests that yoga may be very specific. Specific yoga exercises may have specific benefit for specific disorders. So, for example, if you have a respiratory disorder like emphysema, there are specific breathing techniques that may improve your ability to breathe. So, those are sort of real psychophysiological research findings that really support the benefits of yoga practice.

I also like to think about yoga practice being a sort of a temporal domain on the short term as people practicing techniques, there are changes that occur within, certainly within a yoga class but even within 10 to 15 minutes and this is arousal reduction, reduction in the stress response and also this physical and mental well-being that comes from practicing yoga and these changes are immediate. This is the satisfaction that people get when they go to a yoga class. They walk in in stress, they walk out much less stressed. However, as people start to practice, things start to change in both the mind, the brain, and the body and people start to develop greater mind-body awareness. They develop this resilience to stress, the ability to self-regulate their internal state and that is very self-empowering and brings the mind and the body back into an equilibrium state of ideal balance, but as people practice over the long term, now we are talking say months and years, these types of contemplative practices can lead to sort of long-term psychological and philosophical transformation. People start to change their relationship with themselves, their goals, who they are, what they are doing, what their goals are and they start to gravitate towards more positive behaviors, more positive health behaviors, and that kind of change in addition to leading just sort of a deeper experience of spirituality and well-being can also be very valuable for patients with lifestyle diseases who really need to make major changes in their behavior and lifestyle to cope with these lifestyle diseases which in modern society have actually become epidemic proportion. We are talking about here obesity, diabetes, hypertension, and depression.

So, in addition to all of this theory that I have just described, we now have a large body of growing evidence of yoga research that's showing that in fact in people who already have these types of diseases, yoga can be beneficial and so we have hundreds of studies now, clinical trials of yoga for specific conditions – psychiatric conditions like depression and anxiety; cardiovascular conditions like hypertension, heart disease; respiratory conditions like asthma, diabetes; endocrine condition. There is a huge body of research now showing that yoga is very beneficial for cancer patients and again, this is not necessarily curing cancer, but certainly dealing with the stress of cancer and the diagnosis of cancer. So, these studies are growing. There are now actually reviews of studies of what yoga can do for these variety of conditions; however, many of these studies are still preliminary studies, they are small, and that's what happens as a consequence of any field which is really brand new. Yoga therapy research really didn't start until the 1970s, so we are still a growing field and however, that field is exploding. We are seeing an exponential rise in the number of clinical trials that have been published in a variety of different clinical conditions like low back pain, depression, and a variety of others and we are looking at future in terms of where yoga research is going. There are constant new disorders that are being evaluated with yoga therapy. We have very powerful neuro imaging techniques that are showing how yoga is affecting the brain. We are even seeing studies that are looking at genomic expressions, how yoga practices actually affect our DNA in terms of turning on and turning off specific genes. Ultimately, I think we are going to see that this research will show us specific yoga practices having specific benefits for specific disorders and specific conditions. I think it is important also that we ultimately will be



conducting cost effectiveness studies to show that these studies are really beneficial. They cost little and yet they are really addressing underlying symptoms and yield long-term benefits.

I think an area that's really close to my heart is the prevention aspects of yoga, maintenance of health, which is really under recognized in our society and I think the old adage that an ounce of prevention is worth a pound of cure really works here for yoga. If you can maintain your physical and mental health, you are going to be much more resistant to disease. That supports our research and we are trying to bring yoga into public schools and identify and show that yoga in the public schools will provide long-term benefit and not only that, not only will yoga improve negative conditions, it will enhance positive psychology. It will make people more happy, more functional, and more integrated. Yoga research, I think, is really expanding out and involved in organizing through the International Association of Yoga Therapists Symposium on Yoga Research. Our next research conference is this coming June in Newton, Massachusetts, where we invite a lot of, you know, speakers and we have a lot of post discussion. Its the time for researchers to get together and that will be back to back with our symposium on yoga therapy and research which really integrates many yoga therapists in the field.

And I just want to end with a rationale for why, why we should be doing the research. One would think that just doing the yoga should be enough and, you know, obviously its very popular, so why do we need to spend the money on research and the reason is that what we really need is the evidence base to demonstrate that yoga belongs in the medical system as an adjunctive therapy and the research is necessary for yoga to be justifiably implemented in not only the healthcare system, but we hope also ultimately in the school system.

So, its something that's very popular. Its something that's growing very rapidly and I think that if we can really end up implementing yoga both in our healthcare and school systems, we will see a sea change in the health and well-being of the entire population. So, I look for a bright future in the dissemination and the practice of yoga in the general public.

Sharib : Dr. Khalsa, that was absolutely very, very useful summary because... and every time, you know, you explained how yoga works at the brain level causing changes in the brain circuitry and also that these things take effect from few minutes to over months and years, that's a very important summary point because it, you know, provides the value of the practice in short term as well as medium to long term. Is there... Is there like a specific time frame under which these changes happen and where these changes happen in the brain? Can you elaborate a little bit on that, on what particular areas of the brain get conditioned with the practice in the short term, medium term, and the long term?

Dr. Khalsa : Yeah. I think..I think the areas are pretty much similar from the short term over to the long term. I think certainly these changes studied by Sara Lazar in Mass General Hospital, Harvard Medical School, have shown that these changes in the brain can take place in as short as eight weeks and the areas of the brain that are involved are those areas of the brain that are control of attention, self-regulation, self-referential processing and I think as we go into the longer term we start to see changes in the emotional brain and the ability to cope with emotion more effectively and these changes are actually physical changes. They are actually structural changes in the brain. There are areas of the brain that get sicker with practice and this is evidence of what we call neuroplasticity in the brain, so your brain becomes more effective in coping with this and some of the areas of the brain that are involved are the attentional network and the dorsolateral prefrontal cortex and that has connections with this area of the brain, the emotional brain, the limbic system, and so you see changes in those two systems that are really important in regulation of stress and emotional reactivity.

Sharib : So, I would assume and this is a question actually, I am jumping a little ahead, by one of our listeners, Christine Stenhagen, who wants to know if there are positive effects on the immune system through the HPA axis by the practice of yoga. So, I would assume as you are explaining that this might be the case that it might affect the immune system and other hypothalamus pituitary access through these circuits.



Dr. Khalsa : Yes, this is absolutely true and we have now some evidence for that. There is a very tight connection between the stress system and the immune system. The HPA axis, the hypothalamus-pituitary-adrenal axis, is one of the main stress systems and when you activate this relaxation response in contemplative practices like yoga, you engage this relaxation response and the hormone that's involved in the HPA axis is cortisone and the cortisone levels drop down. We now have actual studies that have shown in practical circumstances that bringing these practices to individuals will actually improve immune function.

One example of this study done by Richard Davidson in a corporate setting, in a business setting, where they came in, they gave the contemplative practices, meditation and yoga, and then gave the individual participating an immune challenge. This was a virus and then they looked at their response to that and showed that those people that had practiced these contemplative practices had a stronger immune response.

Another example is in cancer patients where they have shown that immune factors are greater in people who have practiced yoga than patients who did not have the yoga practice and this is the whole burgeoning field called psychoneuroimmunology, the relationship between the mind and the brain and the immune system, so I think yoga...has a real role play through stress reduction in enhancing immune function.

Sharib : Great! So, before I bring on the panelists and introduce them, I also wanted to quickly touch base upon what you mentioned and which is very heartening to hear that there are more and more clinical trials happening for yoga and meditation and that we need this evidence for it to become part of medical practice and so how much have you seen a change in the National Institute Of Health or other agencies? Who are the ones who are really funding such research and how much change has happened in the last decade and where do you think, in terms of dollars how much you expect the money to flow in so that we can have more studies like this going forward?

Dr. Khalsa : Well, the research really was supported mostly and really accelerated with the formation of the National Center For Complementary and Alternative Medicine at the NIH, the National Institute Of Health and NCCAM was formed to fund alternative and complementary medicine research and that started in the year 2000 and so since that time, they have accelerated the amount of research that has been done in yoga because yoga is one of the key areas that they do fund and I have been funded by NCCAM in trials that I had conducted and a lot of my colleagues also. So, they have really advanced funding for research in yoga. Now, having said that, you should not please misconstrue the fact that this funding is huge. Its still compared to research like pharmaceutical research and research in surgeries and so on and so forth, its just a very small drop in the bucket.

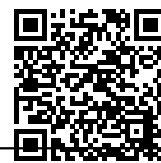
Research is always being challenged by conventional sciences. So, although we have more yoga research going on than ever before compared to conventional research, it is very, very small and it is very, very difficult to acquire this funding and still very, very challenging to maintain yoga research because of the difficulty of getting funding for this.

Sharib : Uhhh.... I will come back to this a little bit if we have time, but I will move on now and introduce our panelists one by one. So, our first panelist today is Dashama and she is a yoga and fitness expert with 10+ years in the industry, training, coaching, and consulting clients and companies in yoga and lifestyle and fitness. She is a multimedia producer with videos, books, and DVDs, which have been featured on ophrah.com, Wal-Mart, Barnes & Noble, Target and her YouTube channel gets more than 8 million viewers watching her yoga and fitness videos. So, with that, I will bring Dashama on air and she will have a conversation with you, Dr. Khalsa. Dashama, you are on air.

Dashama : Hi Yes. Thank you so much. I am happy to be here.

Sharib : Yes, we are happy for you to be able to take time out and have a conversation with Dr. Khalsa.

Dashama : Yes, I just heard everything that you said, doctor, and it was brilliant. Is there something



specifically that you would like to talk about or shall I interject or ask a question?

Sharib : Yes, you can ask your questions from Dr. Khalsa. Yes.

Dashama : Okay. Perfect. Absolutely. You know, I went to college and in my university they weren't studying this, so I am really [00:26:50] glad to see that they are studying these topics at Harvard Medical School. I would like to talk a little bit about that. It sounds like the type of research that you are doing is exactly what we need, especially in the world today. My background is in fitness, but I definitely have had an extensive time really studying and working in the research aspect of hands-on with people who are overcoming injuries and are post surgery and sickness and anything from mental disorders to physical and emotional imbalances and physical trauma on all levels and I too have seen that yoga and meditation and some other healthy ayurvedic and lifestyle alterations can really dramatically improve and transform the quality of the human health in many ways. So, I am so happy to see that this is being studied on the medical school level. Are you... Are here you leading classes in there or is it just on the research level? That's one of my questions.

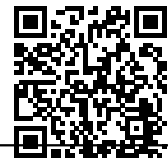
Dr. Khalsa : Um.... Well, I think its going to be a while before we start to see yoga research and even mind-body medicine research in medical schools, its part of the main curriculum. I have been teaching an elective course at Harvard Medical School and mind-body medicine over the past five or six years, but that course is an elective course and students are required to take that, so we have been exposing a few medical students to this research evidence and to the practices, but I think in Boston we have actually a great strength in terms of complementary and alternative medicine research. The Benson Mind Body Medical Institute has been here for decades, working in this area. We have the Osher Center For Clinical, For Complementary Medicine here at Harvard Medical School and we actually have more researches on yoga in the Boston area than pretty much anywhere else in the country, so it really is kind of a mecca for research on yoga. Having said that, of course, you know, there is only about a half a dozen of it here and that compares with thousands and thousands of other conventional researches here in Boston, but it is growing and we do see yoga research in some of our leading institutions. So, the University of California, San Francisco, Duke University, and some of the other very strong institutions do have researches on yoga.

Dashama : That's fantastic! One question, so where do you primarily get the funding research for the non-profit organization that you fund through or is it through grants or a combination?

Dr. Khalsa : Well, naturally all research on yoga is funded by grants or private donors. My funding has largely been from the federal government, largely through NCCAM. I did have a small grant from the Department Of Defense in fact to look at yoga for posttraumatic stress disorder, but largely and over the past few years I have been funded actually by private donors through the Kripalu Center For Yoga And Health. They have an Institute for Extraordinary Living, directed by Stephen Cope and they have gone out to private donors to raise funds to conduct our trials on yoga in the public schools and so for the past three to four years I have been directly funded through the Institute For Extraordinary Living through private donors, but we get our funding wherever we can and it is a challenge.

Dashama : That's fantastic to hear, you know, that its getting the funding, though. Is there anything..What's the future outlook that you see for that branch of the medical center? Would you like to see it integrated as a required course or a whole area or a major study within the Harvard curriculum or what's your future outlook for the scholastic side of the study?

Dr. Khalsa : Well, I think what we are doing with yoga research is we are building what's called an evidence base. We are building up a critical mass of clinical trial evidence that shows the benefits of yoga in healthy individuals and in different disease states. Once that critical mass reaches a certain point, there is justification that then starts including that in the medical curriculum. To that point, medical students will be taught with these techniques that are available. Once you get it at that level, at that scholastic level, through the medical practitioners, that's when it starts to get disseminated into society. So, just to give you an example, a farmer in Alabama has insomnia. He goes to a doctor five years ago and says, I have insomnia.



He gets a sleeping pill right away. So, in the future at some point in time when yoga research is taught in medical schools and medical school students are made aware of that technique being available, that future scenario would be that a farmer going to his doctor and the doctor would say, you know what, I can give you a sleeping pill, but there is now some research evidence showing that yoga is good for insomnia. So, why don't you try that first and if that doesn't work, then we can always come back to the pill, but let's go with that first and that is a sea change, that's where the thing really starts to change.

Dashama : I agree a 100%. One thing that I would love to talk with you about further is I have been developing a television show about the effect of yoga and meditation on the human health experience and we are actually going to be filming this soon and we have been looking to actually integrate a doctor into the show. Its kind of a mix between Eat, Pray, Love meets the The Biggest Loser concept, where we actually take somebody out with some sort of a condition, whether a surgery that they have overcome and now they are healing or a posttraumatic syndrome or some pain disorder, the types of medical conditions that society and humanity are facing at this point and then applying the techniques of yoga in holistic setting and dietary changes and medication and all of the practices and then through a 30-day program watching their transformations and the healing process and at the end seeing the results. So, its kind of a study, a little bit of a research study but more in the media realm and we are going to be doing a documentary, so perhaps we can talk a little bit more about that and we would love to actually support you in any way that we can as far as the funding for your research because I feel it is very important what you're doing.

Dr. Khalsa : Yes, and of course, any kind of private doctors who are affluent, who can see the value of yoga research, we are happy to take funds to support this work. Really, funding is the only limitation we face in moving yoga research forward. There is no resistance from the institutions. There is no resistance from the existing faculty at our school. There is no dearth of people who are interested in conducting yoga research. The only limitation we face is funding. So, wherever that funding comes, whether its from private donors or from federal agencies, we will take it and we have the people that are interested in doing and conducting the research.

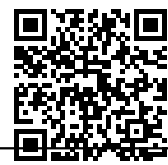
Sharib : Thank you, Dashama, for your questions. I will bring on the next panelist, Dr. Khalsa, but just as a ball park figure what do you think in terms of dollar amount would be needed to bring yoga research to the forefront, you know, the kind of vision you have in your mind, what would be... and we are just curious to know what kind of dollar amount is that? Just a ball park number. It would be interesting for our listeners to know that.

Dr. Khalsa : Well, I can't really speak on for the global terms because I don't work at that level. I work on the level of an individual clinical trial. So, for example...for the major grants that NIH funds, which funds a full size clinical trial, five years long, that grant is worth 1.25 million dollars. So, that's what it takes to run a single full clinical trial. So, as you can imagine, for these trials, we are talking about hundreds of billions of dollars...

Sharib : Uhhmm... Uhhmm... Uhhmm....

Dr. Khalsa : And that is partly now supported to some degree by NCCAM on a very limited budget because NCCAM funds not only yoga but also other options of medicine, so the amount of research that's funded by NCCAM is small but its something that was never there before.

Dr. Khalsa : Uhhmm... Its interesting! Well, I mean, you know, the personal mission as a technology entrepreneur, there are a group of us who always question why there hasn't been a foundation that has, you know, has donated towards yoga and meditation? We hope to be among those foundations that are able to generate this kind of funds needed to promote yoga, but that will happen in due course. Now, I will bring our next panelist on air and that she is Char Grossman. Char Grossman is professionally recognized as a Therapeutic Yoga Specialist, Special Education Intervention Teacher, and a Nationally Certified School

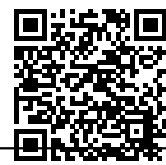


Psychologist. She is an experienced registered yoga teacher as well and she has obtained professional training at Duke Integrative Medicine in Yoga Awareness for Cancer and completed MD Anderson Integrative Medicine Programs Oncology Training Conference and she has also set up YogaReach as a therapeutic yoga program that inspires individuals of all ages and abilities to develop educational, physical, mental, and social competencies. So, Char, you are on air and you can go ahead. Yes. Yes.

Char : Hello Dr. Khalsa, I think we met many years ago since the IAYT. I am very active in that also and I have enjoyed reading all the different types of research projects that you have done. Years and years ago, I suffered an acute intracranial hemorrhage and I underwent the resection of the cavernous vascular malformation and a surgery was done at the Cleveland Clinic and they went ahead and removed the anomaly, but what it left me with was the right hemiparesis, aphasia, cognitive deficit, right upper quadrant visualization fields and much of emotional problems with stress and, you know, you go through the different types of treatments and therapy like the OT, the PT, etc., and speech therapy and, you know, that's supposed to cure you and it didn't and I got very upset and aggravated. My stress level was like so high that the word "yoga" came up on my computer and I ended up going to Omega at that point and Beryl Bender Birch put me through yoga classes she was teaching and said if you put your mind and body together, you can make changes and I had never heard of this. This is like, you know, 19 years ago. Who heard of that? And the thing that research has been showing with the neuroplasticity is that it can make changes. I have a full, a 100%, a 150% recovery and its really due to the yoga and yes, there's other things involved also, but, you know, yoga is my life and my question to you would be as a young stroke survivor, you know, in the past, I haven't seen much research as far as being done with the people that are young stroke survivors. I have seen many, lots of different types of research with veterans, with people that are between 70 and, you know, much older than that, but I haven't seen any type of studies with people that are between say 20 some and you know, 50ish, like you know, I was right in the middle there and I would love to know how you implement a research study that would be able to show that young stroke survivors can be, you know, can have some of the deficits changed, can have some of their healing, you know, really happen due to going through a yoga program, say, six to eight weeks and I am not a research person anymore. I mean I was when I was in the public school, but, now, you know, I would teach the class being the yoga therapist, but I would like to hook up with somebody that would be able to take yoga and look at how its going to implement, how its going to improve people that are young stroke survivors. Is there any specific way that I would go about finding out about that?

Dr. Khalsa : Well, what you are talking about is really research design and actually yoga is not that much different than another intervention and so the research design that you would use would be a randomized controlled trial. And, and of course, that involves all of the things that are well known in research design, yet for the control groups with the matching characteristics in order to really have some sense of confidence. You have to screen the population, you have to make it homogeneous population if possible depending upon what you are trying to address. So, this is all... This is something that is well learned by people who are scientists in training, is to have to develop a strong research design in order to address these questions and there's a lot of specifics involved – the type of population, the type of intervention, the standardization of the intervention, the kinds of outcome measures to what you measured, in terms of benefits, how you analyze the data, etc., etc.? So, and there 's a lot of complexity involved and that's why, you know, it takes people who have spent years and years training in scientific research to design these studies. So, depending upon the scientific question you are asking, there would be a different research design. You could be looking at short-term effects. You could be looking at long-term effects. You could be looking at physical, psychomotor. You could be looking at motor function. You could be looking at a logical function. All of these things are different and will change the research design to look at different things. Now in the field of the stroke, there's not really been that much that's been published at this point in time in yoga. In fact, of the 25 or so papers that have anything to do with yoga and stroke, almost half of them have been published in the past three years or so.

And all of the trials that have been published are very, very small preliminary trials. So, there is a lot of opening here to evaluate the benefits of yoga for stroke victims, but alluding to what you were saying earlier, this whole mind-body, invoking the mind-body connection, its almost a miracle. Its amazing how powerful this



stuff is and its just so simple that it seems like there's got to be some kind of trick somewhere, but there really isn't. Its just as simple as that. What you are doing is integrating the mind and your body to this contemporary practice and that comes up with these miraculous findings. I mean, there are constantly new disorders that yoga is being applied for that are stunning me. I mean had you asked me 10 years ago if yoga was good for schizophrenia, I would have been very doubtful. But now there is whole body of literature on that, showing benefits of yoga for schizophrenia. So, it really is amazing how something so simple can have such profound effects.

Char : You know that's what's very interesting to me and I do work with some stroke patients and I also work with people with Parkinson's and specifically with the stroke patient and the caregiver, the caregiver is watching the stroke patient be able to open up the right hand which has been, you know, gone through right hemiparesis and they have it like a fist and I say, no, the fingers can open. Between the mind and the body, we can do that and, you know, the caregiver is just, you know, so amazed that the person can open their whole hand and I am not, you know, a miracle worker, but I know that it works and if I can do it, I would think that many other people can do it. So, that's what I would like to, you know, be teaching others, how to get different types of people with medical challenges, you know, how to make them really improve in their health as much as, you know, they are able to. I do have one more question, which basically goes with Kripalu yoga in the schools program. You know, when you look at high school students, they have semi-stressors, be it, you know, waking up super early in the morning to get to school and study late at night and maybe they are trying out for, you know, one of the teams and they are not sure if they are going to make it, etc., and you know, stress that keeps coming to high school kids all the time and I wondered with the Kripalu program, has there been a lot of research that's showing how the yoga is helping those high school students decrease the stress, you know, that may be affecting them during the day?

Dr. Khalsa : Well, obviously, this is the center of the research in my laboratory. Now, we have only been conducting this research for about three to four years, but what we have shown in both quantitative and qualitative studies is that indeed these students are developing the ability to self-regulate, the ability to cope with stress more effectively. They are describing that they are actually using these practices in day-to-day life. They are starting to become less anxious. They are starting to become more calm and more focused and that has consequences on all kinds of behaviors, on risk factors for substance abuse, on risk factors for overeating, for insomnia, for all variety of things. I mean our adolescent and child population is under enormous stress and its just under recognized and the problem is that our school system has nothing in place to teach our kids to cope with this stress. Its really not there. Our school system is focused on academic achievement, not on emotion regulation and so our goal in showing this research is that emotion regulation is extremely important for the mental and physical health of our kids as well as for their academic performance because the two are tied together and so to us this is a very important field of research, but its really in its infancy. There are less than two dozen studies and these are all very small studies on yoga in school setting. So, its really a field that deserves a lot of research.

Sharib : Thank you, Char. In the interest of time because we are running short on time now, I will bring on our last panelist, Micheline, and we have a couple of questions from the audience as well, so I would like to squeeze them in. So, let me quickly introduce Micheline. She is the Oncology Counselor at Life With Cancer and in addition to being a licensed clinical social worker, she is a registered yoga teacher and certified end-of-life counselor. She has developed a six-week mind-body education series, leads yoga and meditation classes for patients and caregivers and facilitates support group. Micheline, you are on air and please go ahead.

Micheline : Hi! Are you there?

Sharib : Yes.

Micheline : Hello! Oh, okay. Great! Hi!

Sharib : Yes, you are on air.



Micheline : This has been wonderful and I actually have a larger scale question than one of the ones I submitted. I hope that's okay. As I am listening, my mind is going in different directions. I work within a large medical system, you know the healthcare system in Northern Virginia which, you know, is not synonymous with contemplative practice and I am just sort of wondering are there large medical systems around the country that have integrated yoga and/or contemplative practices into their medical care and what that might look like. If people were sort of prescribing that, are you familiar with any that have already done this?

Dr. Khalsa : Well, this is an area that we are striving to get into. There are not a lot of examples where this has been implemented. There are certain fields in which its more implemented, its difficult to find a cancer center now that doesn't offer yoga. But, there is a lot of work to be done on the lobbying of it. Its one thing to have the research in hand, its another thing to actually promote this research and move it into reimbursement and medical care system. One of the leading persons in this area is actually Dean Ornish who's conducted yoga lifestyle interventions in cardiac disease and in prostate cancer, for example, and he's working at this level of moving these kinds of integrative mind-body practices into medicine. He was actually involved in the recent change in Medicare support for yoga programs, yoga lifestyle programs for heart disease. That's an example of where this can go.

Micheline : If we, at our cancer center, we see thousands of patients a year. If we were wanting to sort of offer those patients into, tunnel them into some larger research efforts, what would you suggest might be our next step?

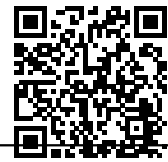
Dr. Khalsa : Well, what you really need is a researcher or principal investigator at the site who is interested and motivated in this work and then what you need is funding for that investigator. That investigator can write a grant. Its very difficult to run a study without funds. A lot of investigators do need to run small pilot trials with volunteer efforts, trying to get pilot data. The pilot data is then used to justify application for a larger grant. So, what we really need is the principal investigator really dedicated to this, dedicated to yoga research and the problem with yoga research is that its difficult to get funding. Going into yoga research has been described as career suicide from the convention because its really a challenge. However, some of us are meeting with success. One of the leading researchers Lorenzo Cohen at MD Anderson who has gotten funding for a phase 3, a very large trial of yoga for cancer patients, millions and millions of dollars and so there's an example of someone who has had success in making a major trial of yoga.

Micheline : Wonderful! Thank you.

Sharib : Yeah, okay. We do have one more panelist who was supposed to dial in, but we can't see her online. Krishna, if you are there, can you just press 1 on your phone and we will know you are on the call and then we will try to get you on air, but we have Mikael D Temple who wants to ask a question and I will bring her on air. Mikael? (Pause) Would you like to ask your question? Number (7203) 716-410, you are on air. (Pause) Okay. I will read out. Her question is, she wants to know what are a couple of yoga breath techniques that might be helpful for relaxation, Dr. Khalsa?

Dr. Khalsa : Well, I think that's a general yoga question and I think the most powerful and the most central breathing technique in yoga is the long, slow, deep breathing part and when we combine that long, slow, deep breathing with the meditation components, for example, meditating on the breath and meditating on prayers that are words, you end up having a very, very powerful technique that is not only very effective at reducing stress and making changes in the autonomic nervous system but also one that's virtually easily used, no matter what that is, that is an extremely powerful technique and so I was very sad at #1, the long, slow, deep breathing pattern, breathing at about, you know, its possible for the individual then to progress to minutes and its important that this breathing pattern be done appropriately so that the movement of the abdomen is involved, so called abdominal-belly breathing, moving with the entire torso before each breath and I think that is the most fundamental breathing practice that has enormous benefits.

There are a number of other breathing techniques that may be used depending upon the disorder, but we don't have a lot of scientific research, but a yoga therapist may have sort of personal experience with the



particular benefits of these types of breathing practices. I am talking about things like closing the nostril breathing or fast breathing techniques as Kapalabhati so most of them we know and and we do it, it is a long slow breathing process.

Sharib : Uhhh... Okay, so I will ask one..., few other questions because we have five to six minutes left in the call. There were a bunch of questions submitted by multiple myeloma patients and their main worry or concern is that is yoga possible for multiple myeloma patients? Is it safe because some of these patients have bony lesions, especially in the spine and ribs, and Dr. Khalsa, if you have had any experience working in this area or Char or Michel, if you would like to jump in, Dashama, if you have worked with any multiple myeloma patients, please chime in after Dr. Khalsa about your opinion about such patients and what precautions they should take if they want to do yoga?

Dr. Khalsa : I think I will leave the specifics to the yoga therapists and the clinicians because I am not a clinician or a yoga therapist myself, but I will make a general comment. Yoga for the general public is not the same as yoga therapy. Yoga therapy similar to yoga intervention is to accommodate an individual under limitations that those individuals have in those particular disorders. But I can say pretty definitively that you can always do something, even if its long, slow, deep breathing with meditation on the breath, that is the feeling I have, even minor postures or physical practices to that, that's fine, but the specifics are really important. It is very important to have that information conveyed to a yoga instructor that the individual can ask the yoga therapist to be very familiar with the characteristics of the therapy.

Sharib : So, Micheline and Char, have you ever worked with any multiple myeloma patients and have you got any advice for them? Or Dashama?

Micheline : This is Micheline and I have worked with several multiple myeloma patients one on one and I felt what Dr. Khalsa is saying, I tend to focus on these sort of breathing practices, the relaxation. I think just a regular off-the-street yoga class can be really contraindicated. There are a lot of things that we probably shouldn't be doing, but meditative work can also even with asana practice, the physical components of it, having that can be very restorative so that, you know, bolstering them, propping them up and really keying in specifically to limitations and things like this that they might have.

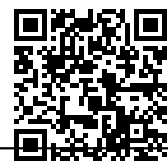
Sharib: Uhhh... Uhhh... Char and Dashama, if you have anything to add, before we move on to the next question?

Char : Yes. This is Char.

Sharib : Yes, Char.

Char : You know, my concern is, you know, the way their body is and as far as their brittleness and I agree with the statements that are made already with the meditation, but I would do like even a visualization, you know, get them dreaming about something, get them looking about something, teach them how to make energy go into those body parts where they are definitely in pain. You know, everything else depends on the individual obviously, but, you know, I don't feel comfortable saying that you should do this, this, this or that, something, you know, with the visualization or just related to meditation and it will be sort of, seem to make the most.

Dashama : Absolutely, and I would just add that I think the effect way is always to include lifestyle changes. So, in addition to breath or visualization and various yoga therapy processes, I would always suggest a change in diet and a movement towards alkalizing the diet with green juices and a lot of water, that's also learning to balance the pH as well as integrating music therapy and camping which can really help balance the hemispheres of the brain but also the frequency that the body is carrying when its in a state of sickness like that is something to bring yourself to a state of harmony and so music can be very powerful for that, both to listen to and also to sing and chant along with it and so I recommend that to my patients as well.



Sharib : Sure. Thank you for... Actually, this was asked by Pamela Schulz and I think she is on the call, though we couldn't get her on air. So, I hope that answers Pamela's request for specific information about myeloma patients. We have four minutes left for the call to end, so I will take up one last question and we can go through with Dr. Khalsa and then the panelists and that is, you know, general questions people have asked, how can yoga help someone with cancer and if yes, are there any contraindications about what to do or what not to do. So, Dr. Khalsa, very quickly, if you can summarize anything for cancer patients and words of advice for them followed by Char, Micheline, and Dashama. Yeah.

Dr. Khalsa : Yeah, I think the center of map with yoga is really appropriate for cancer patients and that is best to that. That's really the goal that yoga practice was for in cancer patients. Its not really to cure cancer, although that's not inconceivable in individual cases depending upon the individual, but I think the goal is really...and the other thing about yoga therapy is that it has to be very individualized to be most effective. Its not a one size fits all. There are different types of cancer. There are different patients, different stability, different stages in the cancer progress, the diagnosis, the chemotherapy, the surgery, post surgery and every individual is very different. So, I think individualization is very important bearing in mind that person's limitations and capability.

Sharib : Uhhh... Char and Micheline, do you have anything to add there?

Char : Yeah. I was going to just mention that individualization, which I totally agree about that as yoga therapists, as yoga teachers. If we do have people that are walking in with cancer or any other medical challenge, we have to know how to individualize whether we have, you know, five people in the group or its a one-on-one situation because everybody, you know, is obviously different and the more that we can do for that person to feel, you know, life and to get themselves, you know, in a state of mind, like Dashama said and that's what they really need.

Sharib : Sure. Well, I think we are running out of time. So, we will have to cut this out here now, but just to summarize...Dr. Khalsa, thank you for your wonderful summary on how yoga actually causes changes in the neural structures and circuits and that these changes happen from very quick, 10-15 minutes to as long as months and years and that is very encouraging to know that there is more and more research being supported by the NIH and the federal agencies on yoga and clinical trials are exploding though its still a wait before we can have more trials and more knowledge to make yoga a prescribed therapy in the medical practice. Thank you, all the panelists, for taking your time out and for your thoughtful comments and insights. Thank you to all the listeners and for all the questions that came in. We will be having the series on an ongoing basis and we hope to have the next one in June and send out information about this to everyone. I hope everybody enjoyed the show and we would really welcome your feedback as this was the first time we had something on yoga and we really want to support alternative and complementary medicine through this talk show. Dr. Khalsa, once again, thank you very much and we look forward to more such conversations in the future.

Dr. Khalsa : My pleasure. Thank you.

Sharib : Yeah. Well, thank you everybody and the recording for this will be available online on our blog, Cure Talk, and Priya will also send it out to everybody via email. Thank you once again and have a lovely day.