

COURSE CURRICULLUM

YMS 101 – Intro to Yoga Therapy for Medical Professionals – 22 hr CME

October 8-10, 2011 at Howard University, Washington DC

A. COURSE SUMMARY

1. COURSE DESCRIPTION: Another name for this course could be ‘Yoga as Medicine’. The course is intended for physicians and other medical professionals. The intent is to describe the basis of yoga and the research done for therapeutic purposes and for health maintenance. Such knowledge brings a different way of thinking of life and healing process, and potentially prepares a physician for considering entirely different forms of treatment that may be less invasive and less subject to side-effects than conventional medicine, especially in cases when conventional medicine does not have good answers. This approach of healing can be used as a complementary practice for treating diseases.

Yoga for therapeutic purposes has been considered more recently in the Western World, although it has been more common in India for many centuries. Awareness of this has created an environment where the NIH through NCCAM has been funding a number of studies related to yoga regimens.

The approach of Yoga is well-being from physical, emotional, mental, social, and spiritual balance. This is also the intent of medicine as per the definition of the World Health Organization, although in typical practice medicine focuses on Disease Management and Disease Therapy. While the entire focus of yoga is to create such a balance to prevent diseases, yoga can be used to cure or manage diseases as well. These include a wide range of diseases or conditions such as Back Pain, Cancer, Metabolic Disorders, Respiratory Disorders, etc. as indicated by the research done through NIH funds, and also leading Research Institutions in various parts of the world.

2. COURSE CONTENT - Lecture & Discussion Cover:

<ul style="list-style-type: none">➤ Relevance of Yoga Therapy in Medicine➤ History of Yoga➤ Understanding Yoga, Hatha Yoga, Meditative Practices and Yoga Therapy➤ How Yoga Heals➤ Yoga/Meditation Therapy Research Overview➤ Importance of Breathing Practices➤ Importance of Meditative Practices	<ul style="list-style-type: none">➤ Ayurveda and Practices Allied with Yoga - Role of Spine & Massage Therapy, Reiki Healing➤ Yoga Therapy for Specific Disease Conditions - Metabolic Syndrome, Cardiovascular Disorders, Respiratory Disorders, Musculoskeletal System Disorders, Neurological Disorders, Psychiatric Disorders➤ Simple techniques/paradigms for relaxation
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Practice Covers: (a) Breathing Exercises – Bhastrikaa, Kapaalabhaati, Baahya Kumbhaka, Anuloma-Viloma Praanaayaama; (b) Yoga posture practices for digestion, elimination and good sleep, and musculo-skeletal toning and balance; (c) Vibration techniques of sound often called Chakra meditation; (d) Other meditation techniques (with affirmations) and Deep Relaxation with Yoga Nidra

3. FACULTY - Sat Bir Singh Khalsa PhD, Asst Prof of Medicine at Harvard Medical School

Arvind K. N. Nandedkar PhD DABCC, Professor of Biochemistry & Molecular Biology, Howard University
College of Medicine–COURSE DIRECTOR
C. Rajan Narayanan PhD, Executive Director, Life in Yoga Institute
Dilip Sarkar MD, FACS, Dyur, Director of Division of Yoga & Medical Sciences, Life in Yoga Institute

4. COURSE ATTENDANCE LOGISTICS

EMERGENCY CALLS DURING THE COURSE: 240-463-4327(Dr. Nandedkar);

LOCATION: Clarion Inn & Fundome, 8601 Baltimore Boulevard, College Park, MD 20740.

MEALS: All food is arranged with the catering service of Clarion Inn. The food provided is expected to be low fat, vegetarian diet without garlic or onion, with the inclusion of milk products. Lunch will be served as a buffet in the breakfast area of the Atrium. Beverages and water should be available throughout the day. For guests staying at the hotel, breakfast is included and provided in the breakfast area in the atrium.

PARKING is free and available all around the hotel property.

PUBLIC TRANSPORTATION – Green line Metro Train comes to College Park station, which is about a mile from the Clarion Inn. There are buses (83 and 86) which should come straight in front of the Inn.

LODGING FOR OUT-OF-TOWN TRAVELERS – Clarion Inn will provide a preferred rate of \$87 plus taxes per night for participants so long as they have rooms available. Call 800-442-1644 or 301-474-2800 and ask for reservation group account code 616891. If they are filled up, for alternative suggestions contact Dr. Rajan Narayanan at 301-328-3845.

B. DISCLOSURE

All the four faculty indicated in this curriculum and the planning committee members have declared:

- That they have no financial relationships with any commercial interests in the past 12 months;
- They will not accept financial remuneration directly from any commercial supporter for this program;
- They will uphold academic standards to insure balance, independence, objectivity and scientific rigor in their roles in this program.

C. COURSE DETAILS

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1. COURSE AGENDA AND SCHEDULE

(Approximate schedule – may be modified)

Saturday, Oct 8

8:00 am to 8:30 am – Registration/Check-in

8:30 am to 8:45 am – Course Introduction - [NANDEDKAR, COURSE DIRECTOR](#)

8:45 am to 9:30 am – Introduction to Yoga Therapy – [SARKAR](#)

9:30 am to 10:00 am – Philosophy of Yoga - [NARAYANAN](#)

BREAK - 10:00 am to 10:15 am

10:15 am to 11:15 am – Anatomy, Physiology & Use of Yoga as Medicine - [SARKAR](#)

11:15 am to 12 noon – Bio-Physiology of Respiration. - [NANDEDKAR](#)

12 noon to 12:30 pm – Practice Session: Power of Breath 1 – CRE Breathing - [NARAYANAN](#)

LUNCH – 12:30 pm – 1:00 pm – [LUNCH in Atrium Breakfast area](#)

1:00 pm to 2:45 pm - Ayurveda & Complementary Practices of Yoga Therapy - [SARKAR](#)

2:45 pm to 3:15 pm – Introduction to Meditative Practices - [NARAYANAN](#)

BREAK - 3:15 pm to 3:30 pm

3:30 pm to 4:30 pm - Practice Session: – Power of Breath 2 – Yogic Breathing Techniques
(Kapaalabhaati, Bhastrika, Bhramari, Anuloma Viloma Pranayama, Bandhas and Baahya Kumbhaka) – [NARAYANAN](#) or [SARKAR](#)

4:30 pm to 5:00 pm – Practice Session: Meditation 1 - Simple Meditation - [NARAYANAN](#)

INFORMAL DISCUSSION - 5:00 pm to 5:30 pm in the Atrium

Sunday, Oct 9

8 am to 8:30 am – Sign-in

8:30 am to 9:15 am- Practice Session: Surya Namaskar and Yoga Nidra - [SARKAR](#)

BREAK - 9:15 am to 9:30 am

9:30 am to 12:00 pm–Research Report on Yoga Therapy including Meditation and specific disease areas - [KHALSA](#)

12 noon to 12:30 pm – Practice Session: Meditation 2 - Effect of Group Meditation - [NARAYANAN](#)

LUNCH – 12:30 PM – 1:00 pm – [LUNCH in Atrium Breakfast area](#)

1:00 pm to 3:00 pm – Yoga Therapy for Specific Disease Areas - [SARKAR](#)

BREAK - 3:00 pm to 3:15 pm

3:15 pm to 4:30 pm – Neurobiology/Brain-Chemistry of Yoga (including Meditation) - Research Report of Specific Practices - [KHALSA](#)

4:30 pm to 6:00 pm – Practice Session: Meditation 3 – Integrated Chaandogya Upanishad Meditation
(Integration of Physical Alignment, Breathing Exercises, Vibrational Cleansing, with Chaandogya Upanishad Meditation)

INFORMAL DISCUSSION - 6:00 pm to 6:30 pm

Monday, Oct 10

8 am to 8:30 am – Sign-in

8:30 am to 10:00 am- Demonstration, Theory & Practice: How to Build a Customized Exercise Regimen - Importance of Sequence in Yoga Exercises, and comparison of Iyengar and Vinyasa Approaches -

[NARAYANAN](#)

BREAK - 10:00 am to 10:15 am

10:30 am to 11:15 am - Yogic Lifestyle Daily Routine (Dinacharya) - [SARKAR](#)

11:15 am to 12:00 am – Practice for Health: good digestion, elimination and night's sleep - [SARKAR](#)

12:00 am to 12:30 noon – Practice: Meditation 4 – Finding your own Meditation Routine- [NARAYANAN](#)

LUNCH – 12:00 noon – 12:30 pm – [LUNCH in Atrium Breakfast area](#)

1:00 pm to 2:00 pm – Stress Management Review, Yoga Theory versus Scientific Validation, and future Research - [NARAYANAN](#)

2:00 pm to 3:00 pm to – Conclusion: Moving forward with Integrative Medicine –[SARKAR](#)

3:00 to 3:15 pm – Program Conclusion - [NANDEDKAR](#)

2. PRESENTATION SUMMARIES

Saturday, 8:30 am to 8:45 am

Course Introduction

ARVIND NANDEDKAR, COURSE DIRECTOR

Yoga for therapeutic purposes has been considered more recently in the Western World, although it has been more common in India for many centuries. Awareness of this has created an environment where the NIH through NCCAM has been funding a number of studies related to yoga regimens.

The approach of Yoga is well-being from physical, emotional, mental, social, and spiritual balance. This is also the intent of medicine as per the definition of the World Health Organization, although in typical practice medicine focuses on Disease Management and Disease Therapy. While the entire focus of yoga is to create such a balance to prevent diseases, yoga can be used to cure or manage diseases as well. Another name for this course could be 'Yoga as Medicine'.

The curriculum of this course will address the basis of yoga and the research done for therapeutic purposes and health maintenance. Such perspectives bring a different way of thinking of life and healing process, and potentially prepares a physician for considering entirely different forms of treatment that may be less invasive and less subject to side-effects than conventional medicine, especially in cases when conventional medicine does not have good answers. This approach of healing can be used as a complementary practice for treating diseases.

The course will cover the following:

- Yoga Therapy Overview
- Philosophy of Yoga
- Connection of The Human System with Yoga Practices That Promotes Healing and Health
- Extent of Research on Yoga Therapy
- Practices that are Similar or Allied with Yoga Therapy
- General Practices for Health Management
- Specific Disease Management with Yoga Therapy.

While Meditation is an integral part of traditional yoga, researchers and practitioners associate physical practices with yoga and think of Meditation separately. Meditative techniques are the key to substantial healing through yoga and this will be a key component of this course.

Further we have included enough practice sessions designed to take with you few simple techniques or paradigms that will be readily usable for patient care in your practice.

Saturday 8:45 am to 9:30 am –

Introduction to Yoga Therapy

DILIP SARKAR

Yoga has evolved as one of the most reliable, authentic and efficient health care systems available in society today. Most people believe that daily practice of yoga and maintenance of a yogic lifestyle produces better health benefits than regular exercise. These yogic health benefits are useful as therapy for chronic lifestyle-related diseases like diabetes, hypertension, heart disease, arthritis, chronic lower back pain, asthma, stress, and depression.

This segment of the course will cover the following:

1. Discussion on the State of Yoga Therapy Today – which will cover the following:

- Role of Government through the National Institutes of Health
- Involvement of tertiary medical centers like the renowned Cleveland Clinic
- Extent of publications and PubMed (US National Library of Medicine) citations
- User and Research Group Organizations
- Perception among the general population.

2. Discussion on the Philosophy of Yoga Therapy – which will cover the following:

- The roots of Yoga
- Yoga's perspective on physiology, psychology and psychiatry
- The notion of health and health management from the yoga perspective
- The eight limbs of yoga

Yoga Therapy is lifestyle management -- the process of empowering individuals to progress towards improved health and well-being through the application of the philosophy and practice of yoga. It is important for physicians to understand this approach which is quite different from the Disease Management approach with bio-chemicals.

The conclusion of this presentation will be that Yoga Therapy can be used in conventional medicine to treat chronic diseases. Because most chronic endogenous diseases present themselves with acute onset, standard evidence-based conventional therapy should be started at that point, along with personal lifestyle modifications through Yoga Therapy. Over time, Yoga Therapy will improve one's underlying condition and chronic dependence on drugs can be slowly withdrawn, resulting in reduced side effects and improved, drug-free and healthy living.

Saturday 9:30 am to 10:00 am

Philosophy of Yoga - Outline

RAJAN NARAYANAN

Unlike the microbiology and bio-chemistry approach to understand the health of the human body in the conventional medical system, the Yoga approach is to understand the nature of creation, the role of the human being and the body, and the cause of ill-health for the human body in the Cosmic sense. This develops a deeper insight of the human body and allows for treating at a level deeper than the biochemical or microbiology level to address abnormalities. Thus in the yoga approach, in a theoretical sense, it is not about statistical correlations and probabilistic assessments, but rather deterministic at the highest level of creation. However in practical application even the yoga approach has to be applied probabilistically for therapy, since the tools necessary for determinism are not fully available. However, the yoga model of determinism provides deep insight for medical practitioners coming from conventional medicine to get a glimpse of answers to many unanswered questions they may have from years of patient observation. Further, it becomes the framework for developing insight into how yoga therapy works and consider new frontiers for research.

Accordingly, this segment will discuss:

- Yoga philosophy of Creation and Role of Human Being based on the Yoga Sutras of Patanjali
- The Goal of Yoga & the Role of the Individual Body – Direct Experience and Understanding of the Cosmic System and Developing Infinite Knowledge and understanding ones role in creation
- Yoga’s understanding of ill-health and disease condition - concluding that each person needs to be in tune with themselves (following their Dharma) for peace and good health.
- Related texts of yoga that speak on Circuitry of the Human System - The Naadi (energy channel) and Chakra System (energy distribution nodes); Concepts of Balancing and Cleansing/Energizing, and how it works at each level.
- The Five levels of Circuitry or Aura – The SVYASA model and the Life in Yoga Model

In effect the yoga model views the human body as an electrical circuitry where balance in the electrical energy flow ensures smooth functioning. The energy flow is measurable through EAV instruments that measure electrical impedance at each meridian point used in Chinese Acupuncture System which are also referred in certain Indian texts like the Vasistha Samhita. This measurable area of energy flow is one level deeper than the microbiology and biochemical understanding of the human body. However, even within this circuitry, there are five levels that are suggested by the models of SVYASA (Vivekananda Yoga University in Bangalore, India) and Life in Yoga. [Both models are derived from the understanding of traditional texts: the SVYASA model based on Bhṛiguvalli, the third book of Taittiriya-Upanishad; and the Life in Yoga model based primarily on the Yoga Sutras of Patanjali and secondarily on Bhṛiguvalli.] And the higher levels within the circuitry go into the realm of using the power of affirmation (will power) to heal an abnormal condition in the body.

Saturday 10:15 am to 11:15 am

Anatomy, Physiology & Use of Yoga as Medicine

DILIP SARKAR

Yoga Therapy is not evidence-based medicine, but rather, practice-based evidence. A standard template or one-size-fits-all strategy does not work for yoga; it is individualized to each person and requires personalized lifestyle changes. Studies have shown lifestyle changes through yoga can be better than drugs in helping people deal with various ailments. Yoga Therapy is a strong medicine, but it is also a very slow-working medicine. It is very addictive, transformative, and synergistic with other therapies and cleanses the mind and body. The therapeutic effects are achieved through a relaxation response that activates the body's parasympathetic nervous system that calms the mind and body and also aids in digestion. The relaxation response causing a slower heart rate, decreased blood pressure, slow and steady respiration, improved vital capacity, and longer breath-holding power.

This section will discuss the following:

- Physiological effects of yoga poses or *asanas* – the discussion is at a general level and specific level, and also with respect to short term and long term physiological effects.
- Physiological effects of breathing exercises of yoga called *pranayam*.
- Psycho-neuro-endocrinology effect of yoga practices
- Benefits of yoga at the cellular level
- Genetic predisposition for chronic diseases (like diabetes, hypertension & heart disease) and the effect of yoga therapy

This section deepens the connection of Yoga Therapy to the human physiology making it credible for physicians. Further it provides the framework for integrative use of conventional medicine with yoga therapy to treat chronic diseases. Conventional medicine provides immediate response to control abnormal conditions while yoga therapy provides for lifestyle modifications, that in the long term reduces dependence on drugs (that may have side-effects) while promoting healthy living.

Saturday 11:15 am to 12 noon

Bio-Physiology of Respiration

ARVIND NANDEKAR

An important element in yoga practice is achieving an overall chemical balance via control over the respiratory functions. Employing a PowerPoint presentation the basic knowledge is reinforced regarding ACID-BASE status and biochemical-physiology of respiration. Specifically this presentation introduces participants to certain Principles of Physiological Chemistry, guide them through the pathway of practical applications to Biochemistry and Physiological Chemistry for a consideration as a plausible tool that can be used for monitoring respiration (and its compensatory mechanisms).

It is well known that in living cells most of the chemical reactions occur in an aqueous environment. These ordered and regulated chemical reactions follow certain fundamental physicochemical principles

and laws which help in maintaining the harmony with the surrounding environment. The following will be addressed in this presentation segment:

1. Relationship between ionization and unionized status of a molecule.
2. Concept of $[H^+]$ concentration to calculate pH and relationship with exchange of gases.
3. Concepts of association and dissociation constants (k_a , k_b) in relation to the concepts of cations, anions and zwitterions to illustrate the molecular forms present under physiological condition.
4. Principles of buffers to assess the normal physiology of respiration.
5. Workings of bicarbonate and carbon dioxide buffer system.
6. Relationship between hemoglobin and isohydric carriage of carbon dioxide (chloride shift)
7. Application of physiological principles to acid-base status.
8. Differentiation of the compensatory correction processes of the disturbed acid-base status.

Saturday 12 noon to 12:30 pm

Practice Session: Power of Breath 1 – CRE Breathing

RAJAN NARAYANAN

CRE or Cyclical Rhythmic Breathing has properties that reduce stress. The generic concept of cyclical rhythmic breathing is the key element within a practice called Sudarshana Kriya promoted by the Art of Living Foundation. Packaged with two preceding breathing exercises it is popularly referred to as SKY (Sudarshana Kriya Yoga). Several researchers including Brown and Gerbarg of Columbia College of Physicians and Surgeons, New York have reviewed its neurophysiologic benefits and claim to alleviate anxiety, depression, everyday stress, post-traumatic stress, and stress-related medical illnesses. This session will provide direct experience of the process and impact, for attendees, and prepare them to apply such methods for their patient care safely.

Saturday 1:00 pm to 2:45 pm –

Ayurveda & Complementary Practices of Yoga Therapy

DILIP SARKAR

This section will cover Ayurveda and other practices that may be viewed as within the purview of yoga therapy. Exposure to this gives physicians a paradigm that is deeper than the microbiology and bio-chemistry approach to understand health.

Ayurveda is an ancient Indian system of medicine that has its basis in the philosophical system of Yoga and related philosophical systems. However it has many characteristics of modern medicine – tools and concepts of surgery, the concept of bio-chemical imbalance, the understanding of the different

functional systems (digestion, circulation, respiration, etc.). Given its basis in philosophies like yoga, it offers unusual and deeper insight into diseases that is common with other complementary practices. Hence Ayurveda will be the first point of discussion before other complementary therapies.

Ayurveda presentation will cover:

- History and Texts of Ayurveda
- Principles of Ayurveda – the concept of balance
- The Three Natures: Vaata, Pitta and Kapha
- The Eight Areas of Detection for Diagnosis:
- Detailed discussion of tongue and pulse
- Therapy in Ayurveda – diet, lifestyle, herbs and massage
- Discussion of Ayurvedic Panchakarma

The other complementary therapies fall under the category of Energy Medicine. When the human system is viewed as an electrical circuitry healing is viewed as balancing the energy flow. Ayurveda follows this same view. However it also derives techniques used by conventional medicine as relating to surgery and biochemistry to heal. Other therapies focus strictly on energy balancing. Hence for a conventionally trained physician Ayurveda provides the energy concept that is necessary to deal with other therapeutic approaches. Other such therapies will include discussion of the following:

- Mudras (typically finger positions) and Bandhas (energy locks) that serve as neuro-physical connectors to create energy balance.
- Acupressure and Marma Therapy where stimulating points release endorphins and neurotransmitters to treat various organs and correct imbalances in energy flow. Acupressure largely relies on stimulation points on the hands and feet. Marma therapy is more generic and covers other parts of the body too. Acupuncture is an allied area that is related, but will not be discussed.
- Shat Kriyas or The Six Cleansing Practices that come from the Hatha Yoga tradition will be discussed.

This presentation will conclude with a general overview of Stress and Stress Management through lifestyle management and drawing parallels of rituals and lifestyle approaches from different traditions that seek to provide this relief. This presentation will be the key link that transforms a physician's thinking from the conventional approach of disease management and the conception of human physiology to a different level that makes one ready to deal with more details of yoga therapy for specific diseases.

Saturday 2:45 pm to 3:15 pm –

Introduction to Meditative Practices

RAJAN NARAYANAN

The word meditation has been used for any type of absorption of the mind, all of which generally relaxes the mind. According to the principles of Asthaanga Yoga (of the Yoga Sutras) four of the eight elements: Pratyahaara, Dhaarana, Dhyaana and Samaadhi, meet the characteristics of popular meditation techniques. In this segment the following points will be discussed:

- Understanding qualitative differences in meditation techniques in terms of Asthaanga Yoga with discussion of Yoga Sutra concept for attaining Samaadhi. The techniques discussed include Maharishi Mahesh Yogi's Transcendental Meditation Technique, popular Bio-genic Feedback techniques, Vipassana Meditation (and the general category of mindful Buddhist meditations) and the list of techniques mentioned in the Yoga sutras.
- Basic requirements of meditation practices – relaxing the body, keeping the spine aligned, and relaxing the mind.
- Factors that enhance the meditative experience – role of physical stretches, breathing practices, regularity and place.
- Documented Benefits of Meditation with specific note of stress management and immunology functions.

The presentation along with later practice sessions are designed to prepare healthcare providers the necessary tools to apply simple meditation techniques and where appropriate refer to a specialist in meditation techniques.

Saturday 3:30 pm to 4:30 pm –

Practice Session: Power of Breath 2 – Yogic Breathing Techniques

DILIP SARKAR OR RAJAN NARAYANAN

This breathing session will introduce Kapaalabhaati, Bhastrika, Bhramari, Anuloma-Viloma Pranayama, Bandhas and Baahya Kumbhaka. These practices are known to have beneficial impact on stress reduction and on blood pressure, heart rate and even diabetes. Participants will not only experience them, but also develop the understanding for correct practice and instruction. It is very important that these practices be done in a relaxed way to ensure the beneficial effect without any adverse impact.

Saturday 4:30 pm to 5:00 pm –

Practice Session: Meditation 1

RAJAN NARAYANAN

Meditation is introduced after aligning and relaxing the muscles, with the affirmation of letting go of everything – all thoughts. This is the simplest form of meditation. This routine is designed to demonstrate that any health practitioner can easily adopt this type of technique.

Sunday 8:30 am to 9:15 am –

Practice Session: Introduction to Surya Namaskar and Yoga Nidra

DILIP SARKAR

Surya Namaskar, popularly translated as Sun Worship, is considered a comprehensive toning exercise. Yoga Nidra is considered an exercise for deep relaxation. Between the Surya Namaskar and the Yoga Nidra, practices covered the previous day are revisited for practice and reinforcement.

Sunday 9:30 am to 12:00 pm

Research Report on Yoga Therapy

SAT BIR KHALSA

Yoga is a practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health well-being, inner harmony and ultimately “a union of the human individual with the universal and transcendent Existence” (1). These practices are believed to have originated in early civilization on the Indian subcontinent and have been practiced historically in India and throughout East Asia. Yoga techniques include the practice of meditation, regulation of respiration with a variety of breathing exercises, and the practice of a number of physical exercises and postures, in which the focus is more on isometric exercise and stretching than on aerobic fitness.

A general feature of these practices is their capability of inducing a coordinated psychophysiological response, which is the antithesis of the stress response. This “relaxation response” consists of a generalized reduction in both cognitive and somatic arousal as observed in the modified activity of the hypothalamic pituitary axis and the autonomic nervous system (2). Bagchi and Wenger (3), in their early classic yoga research study wrote “...physiologically Yogic meditation represents deep relaxation of the autonomic nervous system without drowsiness or sleep and a type of cerebral activity without highly accelerated electrophysiological manifestation but probably with more or less insensibility to some outside stimuli for a short or long time.” A large number of subsequent research studies examining the effects of these techniques both in isolation and in combination have further confirmed these early results (4-9). Both short term and long-term practice of yoga techniques are associated with reductions of basal cortisol and catecholamine secretion, a decrease in sympathetic activity with a corresponding increase in parasympathetic activity, reductions in metabolic rate and oxygen consumption and salutary effects on cognitive activity and cerebral neurophysiology.

Not surprisingly, the capability to effect psychophysiological functioning has led to the implementation of these techniques as a therapeutic intervention in a number of disorders which have psychosomatic

components. Historically, this limited application of yoga techniques for specific disorders is relatively recent relative to the ancient Vedic origins of yoga (10). Gharote (1987) has stated that “the therapeutic aspect of yoga does not feature in any of the traditional systems of self-help, except in the yoga sutras of Patanjali where we come across the word vyadhi meaning ‘disease’ in the list of disturbing factors of mind that are obstacles to liberation. ... although yoga therapy was not a developed branch of yogic discipline as such, we do get a glimpse of the therapeutic effects of the practices in some of the hatha yoga literature such as the Hatha Yoga Pradipika. However, advice is given here within the context of practice; that is, how to deal with the complaints that arise from faulty practice” (11). In fact, since the primary goal of yoga practice is spiritual development, beneficial medical consequences of yoga practice can more precisely be described as positive “side effects” (12).

This presentation is intended to give physicians an overview on the extent of research in yoga and yoga therapy within the context of traditional yoga philosophy, with focus on certain disease areas and is divided into the following areas:

- Research on the prevalence of yoga and yoga therapy
- The history of research on yoga and yoga therapy – beginning with the first systematic medical application of yoga started in India in 1918 at the Yoga Institute in Mumbai thru the emergence of a new breed of clinicians called yoga therapists and a society called the International Association of Yoga Therapists (IAYT) based in the United States. (13-19;24-27)
- Extent of publications – countries, types of journals, types of analysis, sample sizes and chronology
- Rationale and mechanisms of yoga's benefit
- A review of current and ongoing research on yoga and yoga therapy by disease areas. Disease areas to be covered include Metabolic Syndrome, Cardiovascular, Respiratory, Musculo-skeletal, Neurological, Psychiatric and other specific conditions that have been researched.
- Selected examples of yoga therapy research studies in each disease segment.
- Future directions in yoga therapy research

The application of yoga in a limited and strictly therapeutic manner has drawn some criticism from proponents of yoga (14), given that yoga techniques are in fact part of an ancient and sacred spiritual tradition historically applied as a holistic lifestyle discipline (20). This concern has been further aggravated by the rapidly growing popularity of yoga in the west and its subsequent commercialization and application as a trendy body slimming and fitness tool (21). However, among world traditions, classical Yoga is a useful starting point for inquiry into the relationship of medical and religious health because it connects the cultivation of physical and psychological health with spiritual well-being and exemplifies the idea of religious liberation as healing” (22). Anand (1991) has stated this more simply: “The ultimate aim of medical sciences is the attainment of optimum physical and mental health for the

individual. The ultimate aim of yogic practices is also the same, viz. physical and mental well-being.” (23)

A published comprehensive bibliometric analysis in 2004 has identified the current full extent of the yoga therapy studies published in research journals (34). A total of 181 publications in 81 different journals published in 15 different countries were identified. An analysis of the type of studies reported revealed that 48.1% of the publications were on uncontrolled studies, 39.8% were on randomized controlled trials, and 12.2% were on studies incorporating a control group that did not use randomized subject assignment. The chronological distribution of publication date indicates gradual continuing increase in publications. The 3 types of disorders most evaluated in yoga studies have been psychiatric conditions, cardiovascular disorders, and respiratory disorders. Of the all studies, the discrete disorders receiving the most attention were asthma, hypertension, diabetes, depression or dysthymia, heart disease and anxiety. There are a number of cautions that should be noted in interpreting this literature including no single standardized yoga practice format, a very wide range of the types of yoga interventions and mode of application used, and a highly varied quality of research.

[References with number indicated in parenthesis are noted in the reference section in the same order.]

Sunday 12:00 pm to 12:30 pm –

Practice Session: Meditation 2 – Effect of Group Meditation

NARAYANAN

While there is significant research literature on the effect of meditation, there are only three studies on the impact of group effect. However, veteran teachers of meditative practices recognize the group effect. One technique that actively focuses on connecting the meditation participants in a group is called the Rainbow Bridge Meditation technique. The core element of group connectivity by affirmation is demonstrated in this practice session.

Sunday 1:00 pm to 3:00 pm –

Yoga Therapy for Specific Disease Areas

SARKAR

To reinforce the theory and application of yoga therapy, six areas of disease management are discussed in detail. Dr. Sarkar will present the yoga regimen for each area of disease management and will explain the physiological effect of each exercise providing the rationale and mechanism of yoga’s benefits.

- Diabetes and Obesity as examples of Metabolic Syndrome/Endocrinology Disorders –
- Cardiovascular System Disorders
- Respiratory System Disorders

- Musculoskeletal System Disorders (Back pain & Arthritis) -
- Neurological Disorders -
- Psychiatric Disorders
- Other Disorders (Women's Health, Irritable Bowel Syndrome, etc.)

Sunday 3:15 pm to 4:30 pm

Neurobiology/Brain-Chemistry of Yoga (including Meditation)

SAT BIR KHALSA

This section will review the rapidly growing evidence for the neurophysiological, neurochemical and neuroanatomical changes in the brain associated with contemplative practices, specifically, yoga and meditation. Studies have utilized a variety of outcome measures including electrophysiological recordings (EEG), evoked potential recordings and brain imaging techniques. Both short term and long-term changes in brain function and anatomy have been investigated in both novices and experienced meditators. This emerging evidence is providing detailed information on the specific brain regions affected by contemplative practices and on the interaction between different brain regions during contemplative practices. This work has elucidated potential mechanisms underlying the effectiveness of these practices for both normal and patient populations and has suggested practical applications for mental health and both cognitive and emotional functioning.

Sunday 4:30 pm to 6:00 pm –

Practice Session: Meditation 3 – Integrated Chandogya Upanishad Meditation

RAJAN NARAYANAN

This session will introduce the concept of vibrational (with chanted sound or music) cleansing and meditation based on a technique noted in the Chaandogya Upanishad, in addition to integrating physical alignment techniques already covered in Meditation 1. Using beeja mantra vibrations has been noted by Alan Finger, while many other authors have written on the power of sound vibrations including music. The core component of the Chaandogya Upanishad meditation is the use of the sound OM or AUM, which has been much researched.

Before beginning the meditation, exercises will be done for alignment of the spine. While working on the alignment, the Role of the Spine and Pain in Specific Points will be discussed in the context of Reiki, Spinal Massage as developed by Life in Yoga (with general reference to Chiropractors) and the integral use of pressure/contact and power of mind of the healer.

Monday 8:30 am to 10:00 am-

Demonstration, Theory & Practice: Building a Customized Exercise Regimen - **NARAYANAN**

This section will deal with the Life in Yoga Approach to customizing yoga regimen for each person. The discussion, demonstration and practice elements include the following:

- Developing parasympathetic response to every aspect of living, if possible. This is the idea of 'being an observer' or 'living in the moment' in yoga.
- The Importance of working with exercises in five levels: physical, breathing, vibration, thought and pure observation.
- The three types of exercises evolved in yoga practices, and the differences in their physiological impact and as explained by the yoga concept of cleansing. Yoga approaches of Iyengar, Vinnyasa and Ravi Shankar will be discussed.
- The importance of spinal alignment and sequence in exercises.
- Learning to customize practices for each person: working with physical and other disabilities, and lifestyle factors.

It is the parasympathetic response, to events and observations during activities, that avoids or reduces stress. This is the immediate psychological benefit that translates into physiological and psychiatric benefits as well. While the spiritual benefits of yoga are a different matter for medical science, it is the parasympathetic response developed through yoga practice that is critical to health benefits researched and recognized by medical science. [Khalsa's Research Report.] [While there are researchers working on the spiritual side of yoga, especially at SVYASA, to explain unexplained occurrences of remission of cancer and other incurable diseases, there is no scientific validation at this time and hence is not part of this discussion.]

The Yoga Sutras of Patanjali states that regular practice over a long period of time, i.e. training, is the key to parasympathetic response. While most people do not or will not dedicate more than an hour each day in specific exercises, in stages after such regular practices, one can integrate this idea of 'being an observer' and 'living in the moment' to develop parasympathetic response to most situations in life – ideally every moment of living. However, the reality is that most people are unable to maintain their practice unbroken for a long period of time, and never reach the stage where they can transcend that parasympathetic response to all aspects of living. The Life in Yoga Approach suggests that by studying ones daily activities and ensuring that all natural and regular activities of the day in totality include all the five aspects of exercising even if all five are not present in a single activity, all done with the one-point focus, can lead to a customized regimen of yoga that is part of daily living. This ensures minimizing the chances of compromising regularity and ensuring greater potential for sustained long term benefits.

To develop this customized approach, one requires the right paradigm to assess a person's natural activity and abilities, and also understand the ways in which exercises can be performed with varying effect. This is the focus of this segment.

Monday 10:30 am to 11:15 am-

Yogic Lifestyle Daily Routine (Dinacharya)

DILIP SARKAR

Ayurvedic and complementary systems of therapies suggest more complex pathways to healing and health. A key element of this understanding is that the body-mind complex has everything to heal itself, and any external intervention is only to help the self-healing process – in cases where the system has become highly weakened, the intervention is a requirement to save the life, and in cases where the system is not so weakened, it accelerates the healing process. Ayurveda and Yoga in particular, having this understanding suggest certain daily routines that can have a prophylactic effect on the human system while promoting active healing. The Daily Routine in yogic lifestyle has the following components:

- Circadian rhythm and its effect on the body
- Practices that promote being in sync with the circadian rhythm especially exercise and food habits
- Yogic practices for promoting bowel movement
- Tongue cleansing, cleansing of the nasal passages and the dynamics of teeth cleansing
- Differences between younger, middle age and older populations

While the entire course is designed to bring back the intent of medical practice for health management instead of its disease management focus that has resulted from the economic forces that govern the industry, this particular segment and the previous segment are the bridges from concepts presented to practices. Physicians who have general family practice with patients coming on a regular basis for health check-up should pay particular attention to the ideas noted in these segments and should seek to bring some of these ideas into the lives of their patients, first beginning with themselves and their own families.

Monday 11:15 am to 12:00 pm –

Practice session - Practice for Good Health: Strong Digestion, Elimination and Good Night's sleep

DILIP SARKAR

Yoga therapy is Ayurveda. Health is defined as strong digestion, easy elimination, and good night sleep. In yogic practice we have Asanas (postures) and breathing exercises for improving digestion, elimination and sleep. Demonstration and practice of these exercises will be the focus of this session.

Monday 12:00 pm to 12:30 pm –

Practice: Meditation 4 – Finding Your Own Meditation Routine

RAJAN NARAYANAN

Coming from three previous sessions of Meditation and understanding of customization, participants will be encouraged to find their own meditation routine with whatever other breathing or alignment practices that give them the highest level of relaxation. This serves as a take-away for them to practice regularly, while reinforcing the variety of techniques available and the concept of customization.

Monday 1:00 to 2:00 pm –

Stress Management, Yoga Theory versus Scientific Validation & Future Research

RAJAN NARAYANAN

There are two parts to this presentation.

The first part summarizes the core concepts discussed in the morning session analyzing stress at five levels, the methods of stress management and using meditation techniques appropriately.

The second part visits yoga theory of existence and healing, the nature of scientific validation and the future of research. Acupuncture, EAV (Electro Acupuncture according to Dr. Voll), Ayurvedic system of pulse reading, Reiki healing, differences in acupressure approaches of Chinese, Korean and Japanese systems, and research in Primo-vascular or Bonghan Channels being done at Seoul National University in Korea, epigenetics and telomeres will be discussed. All these discussions point towards new avenues of research that has potential for identifying the single system that explains different systems of medicine – what we could call Unified Medicine.

Monday 2:00 to 3:00 pm –

Conclusion: Moving forward in Integrative Medicine

DILIP SARKAR

This presentation is a summary of all material covered with thoughts on how physicians can use the learning in their practice. Since this is only the first exposure to yoga therapy, for those interested opportunities for progressive learning will be indicated including the opportunity to spend two weeks in India at a yoga health center observing yoga therapy in action with daily recording of medical metrics to note the healing process.

An important point of this presentation is that participants should not mistake a single yoga exercise like a bio-chemical pill that is therapeutic for a particular disease, but rather there could be a whole range of exercises that deliver the same impact. It is really a regimen and lifestyle that delivers the complete result. Therefore it is not uncommon for different schools of yoga to prescribe different regimens for the same disease condition. The realm of impact must be understood within the framework of the 5 by 3 by 1 approach of Life in Yoga and the specific part of the body that may be affected.

Additionally, it is worth noting that yoga is a primarily a health maintenance system and only secondarily a therapeutic system. Therefore good health is sustained by lifelong practice.

Monday 3:00 to 3:15 pm –

Program Conclusion

ARVIND NANDEDKAR

Program Director's message of the following:

- Evaluation and Assessment of Course
- Post Course Practice Impact Assessment after 90 days

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4. FACULTY PROFILE

Sat Bir Singh Khalsa, Ph.D., Assistant Professor of Medicine at Harvard Medical School

Arvind K. N. Nandedkar, Ph.D., DABCC – Professor of Biochemistry & Molecular Biology, Howard University, College of Medicine – COURSE DIRECTOR

C. Rajan Narayanan, Ph.D., Executive Director, Trustee of Life in Yoga Foundation

Dilip Sarkar, M.D., FACS, D Ayur – Director of Division of Yoga & Medical Sciences, Life in Yoga Institute

Detailed Faculty Profiles

Sat Bir Singh Khalsa, Ph.D., Assistant Professor of Medicine at Harvard Medical School

Dr. Khalsa received his doctorate in human physiology and neuroscience at the University of Toronto and has conducted research in neuroscience, biological rhythms, sleep and sleep disorders for over 30 years. For the past 9 years he has been fully engaged in basic and clinical research on the effectiveness of yoga and meditation practices in improving physical and psychological health. He has also been personally involved in the practice of a yoga lifestyle for over 35 years and is a certified Kundalini Yoga instructor. He is currently the Director of Research for the Kundalini Research Institute, Research Director of the Kripalu Center for Yoga and Health and an Assistant Professor of Medicine at Harvard Medical School in the Department of Medicine at Brigham and Women's Hospital in Boston.

He has conducted clinical research trials evaluating a yoga treatment for insomnia funded by the National Center for Complementary and Alternative Medicine of the National Institutes of Health. This research was targeted at examining not only the efficacy of yoga for the treatment of chronic insomnia, but also the neuroendocrine and neuropsychological mechanisms underlying the effectiveness of yoga practices in this population. He has also been involved in yoga research for addiction, back pain, and depression and has conducted studies on music performance anxiety at the Tanglewood Institute, the Boston University Tanglewood Institute and the Boston Conservatory of Music.

He is actively involved in 2 major research projects. One of these is a research trial supported by the U.S. Army Medical Research and Materiel Command evaluating the effectiveness of yoga in treating post-traumatic stress disorder in military veterans (in association with researchers at the Trauma Center of Boston University). The other project is an evaluation of a yoga program within the academic curriculum of public schools to determine the benefits to students in mental health characteristics such as perceived stress, resilience, emotion regulation and anxiety.

Dr. Khalsa has established relationships with fellow yoga researchers both in the U.S. as well as in Europe and in India. In India he routinely attends and presents at international yoga research conferences and in the U.S. he is actively working with the International Association of Yoga Therapists to promote research on yoga therapy. For the past 5 years he has also been teaching an elective course at Harvard Medical School in Mind Body Medicine, which provides medical students with direct exposure to yoga classes.

Arvind K. N. Nandedkar, Ph.D., DABCC –Professor of Biochemistry and Molecular Biology, Howard University, College of Medicine, joined the faculty in 1968. Currently, he also serves as the Safety Officer for the College of Medicine Complex. He has served as the Director of the Metabolic Screening-Biochemical Genetics Laboratory, in the Department of Pediatrics and Child Health, and the Acting Director of Clinical Chemistry Laboratory, Howard University Hospital.

Dr. Nandedkar is a Diplomate, American Board of Clinical Chemistry (1979) and has been Certified Professional Chemist of the American Institute of Chemists. He is a Fellow of the College of the Forensic Examiners (1995) and is Board Certified in Forensic Medicine (1996). Dr. Nandedkar has earned several accreditations, certifications and licensures by examination and examination credits. As a Laboratory Director he was licensed in New York City, State of Maryland and currently holds the “Interstate Clinical Laboratory” CLIA license in the District of Columbia. Dr. Nandedkar earned his Master of Science degree (1961) from Nagpur University, Nagpur, India and his Ph.D. degree in Medical Biochemistry (1966) from The V.P. Chest Institute, Delhi University, India. He completed his post-doctoral fellowships at the Georgetown University (1966-68). He has served as a Visiting Professor at the Cornell Medical Center’s New York Hospital (1975-1977, 1979-80), Mt. Sinai Medical Center and Hospital, New York(1979-80), and the USAMRIID (U.S. Army) at Ft. Derrick (1982, 1983). He has received Atomic Energy Commission Fellowship, NIH Fellowship and the National Library of Medicine Fellowship, as well as Visiting Scientist Awards from the U.S. Army Medical Program/Battle Engineering and the Minority Student Science Careers Support Program, the American Society of Microbiology. In November 1984, College of Medicine awarded The Kaiser Permanente Award for Excellence in Teaching and in March 2000 he was recognized as the “Outstanding Teacher of the Year”, College of Dentistry. Dr. Nandedkar is a member of the Association of Clinical Scientists and American Association for Clinical Chemistry as well as a Fellow of the American Institute of Chemists; a Fellow of The American College of Forensic Examiners, a Fellow of Society of Toxicology. He has conducted several safety related and OSHA workshops for the benefit of private organizations, professional associations and educational institutions. He has over 72 full papers, abstracts, and presentations at national and professional meetings. Dr. Nandedkar has received external and internal grants and contracts to support his research interest in biochemistry and molecular biology, biochemical genetics and pediatrics and child health.

C. Rajan Narayanan, Ph.D., Executive Director, Trustee of Life in Yoga Foundation

Dr. Narayanan is a founder and inspiration behind Life in Yoga Foundation, a non-profit formed and active in the Washington metro area. He has developed the 5 by 3 by 1 approach of the Life in Yoga Foundation based on the principles of Asthaaga Yoga and the teachings of the Yoga Sutras of Patanjali. He has actively researched different aspects of yoga and has developed many techniques over the last many years. He has also done a complete translation and commentary on the Yoga Sutras of Patanjali and the Bhagavad Gita.

He began teaching Raaja Yoga in Washington area temples since January 1998, after Swami Bua of New York City completed a two week course in Hatha Yoga and Praanayaama. He has been a practitioner of Raaja Yoga since 1981 when he learned TM from Maharishi Mahesh Yogi's Institute. Thereafter between 1993 and 1995 he completed coursework on Hatha Yoga, Praanaayaama, and other Raaja Yoga

practices at the Satchidananda Ashram in Yogaville, Virginia. While including a regimen of Hatha Yoga practices since then in his Raja Yoga routine, he has also been a student of Vedas and other Hindu scriptures. After a two week rigorous course in Sri Siva Vishnu Temple that was led by Swami Bua in 1998, starting initially as a weekly continuation of the Yoga practices, he started teaching new participants as well. Periodically various Yoga teachers and exponents from India and other parts of the US have visited these sessions.

In 1998 he became a Reiki Master and subsequently learned Kriya Yoga techniques of the Lahiri Mahashay lineage. In his exposition, he views all these techniques as part of the Asthanga Yoga Sutras of Patanjali or the Six Steps propounded by Gorakhnath, which he has refined in modern day terms in the Five Fold Functional Exercises (Physical, Breath, Vibration, Thought and Observation) taught by the Life in Yoga Foundation. Therefore the focus is on spiritual upliftment, although the physical and mental benefits are desirable by-products. Understanding of exercise physiology and the single-point focus stressed by Patanjali evolved into the 5 by 3 by 1 approach, where the 5 refers to the functional exercises, the 3 refers to formats and the 1 to the one-pointed focus.

From 2002 he has practiced and taught the Rainbow Bridge technique for cleansing of Karmas and Vaasanas. Mudras and their effect have been recently introduced. The Atma Vyakta Mudra and the Atma Poorna Mudra are part of the innovative discoveries. He has also developed a technique that removes Sanchita Karma that he has called Tryambakam Kriya. A less strong version called Tryambakam Karma Cleansing and a variation called 5-2-3 Karma Cleansing that is taught by the Life in Yoga Foundation is also his development. Besides these techniques, he has also developed the concept of CRE or Cyclical Rhythmic Exercising with the five types of energies, and has integrated them into an innovative development called Dance Yoga. Finding inspiration from the first chapter of the Chandogya Upanishad, he has also developed a more powerful technique of meditation called the Chandogya Upanishad Meditation.

He has also viewed religious practices from various religions to understand their yoga effect. To develop a deeper understanding of these practices he has also studied all the major religions of the world.

Outside the field of Yoga, Dr. Narayanan has worked as a marketing consultant and has served as an adjunct faculty in the business school of Georgetown University and other local Universities. He has Ph.D. in Economics from the State University of New York at Stony Brook.

Dilip Sarkar, M.D., FACS, D Ayur – Director of Division of Yoga & Medical Sciences, Life in Yoga Institute

Dr. Sarkar is one of foremost experts in Yoga Therapy who combines his 40-year experience in Conventional Medicine with his extensive knowledge of Integrative Medicine, including Ayurveda and Yoga Therapy.

After 25 years of practice as a Vascular Surgeon, Dr. Sarkar retired from practice after suffering a heart attack and undergoing by-pass surgery in 2001. Since then, he developed a profound interest in Ayurvedic medicine and Yoga Therapy, devoting considerable time to the study of these ancient treatments and wellness philosophies in Virginia and in India.

Dr. Sarkar has held positions that included teaching as a primary focus of his medical career. He was an Associate Professor of Surgery at Eastern Virginia Medical School in Norfolk, Virginia, and Chairman of the Department of Surgery and Chief of Staff at Portsmouth General Hospital.

He serves on several local and national healthcare boards as: Founding Member, National Ayurvedic Medical Association (NAMA) and Member of its Research and Standards Committee; Member, International Association of Yoga Therapists (IAYT); and, Fellow, American Association of Integrative Medicine (AAIM). He is a certified Ayurvedic Practitioner, and continues to practice and teach classes in Yoga Therapy, Mind/Body Connection, Ayurvedic wellness, Integrative Nutrition, and Integrative Medicine.

Currently, he is the Executive Director, School of Integrative Medicine, Taksha University, Hampton, Virginia, and the Director of the Division of Yoga and Medical Sciences at the Life in Yoga Institute.