Description of the Yoga-based Cancer Rehabilitation Program
Of the Montefiore-Einstein Cancer Center

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and
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Background: The Yoga-based Cancer Rehabilitation Program is based on Integral Hatha Yoga techniques. Hatha Yoga is the most common form of Yoga practiced in the United States. Integral Hatha Yoga was introduced to the U.S. in 1966 by Indian Yogi Sri Swami Satchidananda. It is founded on the philosophy that integrating yoga's teachings into everyday work and relationships will help promote greater peace and tolerance. Integral Yoga is a slow-paced and gentle practice consisting of classical Hatha Poses/Asanas, Deep Relaxation/Yoga Nidra, Breathing practices/Pranayama, and Meditation. The Integral Yoga Institute has branches in many cities around the U.S., with major institutes in New York and San Francisco and is the most highly recommended form of Yoga for cancer patients by Dr. Michael Lerner who incorporates Integral Yoga into his Commonweal Cancer retreats (http://www.commonweal.org/). Dr. Dean Ornish has also used Integral Hatha Yoga in his work with cardiovascular disease patients, with successful physiological outcomes and no adverse events.

The Yoga intervention in our study was developed for use with breast, lung and colorectal cancer patients by Dr. Chirag Shah, a U.S.-board certified oncologist and certified Yoga instructor himself in consultation with experts in India and the U.S. Dr. Shah completed a 3-year oncology fellowship at the Montefiore-Einstein Cancer Center (MECC) where he worked directly with the target Bronx population during which our pilot study grant was funded. He also was certified in Hatha Yoga in 1994 to “train the yoga trainers” under the guidance of Dr Vishnuprasad Acharya from Sir Sayaji Rao Institute of Research in Yoga, which is only one of four courses recognized all over
India by the government of India in Hatha yoga. To ensure standardization, Dr. Shah designed this written protocol covering specific exercises, modifications, and time-frames, in direct consultation with Ricardo Sisco, who has taught the yoga classes in this program since its inception in 2001. Mr. Sisco has been certified from Integral Yoga Institute in Virginia and New York City since 1992 to teach Hatha Yoga Beginners, Intermediate and Advanced levels as well as Raja Yoga, the ethical, philosophical, and psychological foundation of the Yoga Practice. In addition, he is a member of the curriculum of Trainers at Integral Yoga New York City whereby he not only trains others to become Yoga instructors in that discipline but has the responsibility to teach how to modify the practice depending on circumstances and students’ individual needs.

The Yoga-based Cancer Rehabilitation Program has been implemented without adverse event since 2001 with over 240 cancer patients in our Yoga study classes to date. To ensure optimal safety, all components are done in a seated or laying-down position to avoid falls, with rests inserted between each pose, and no rapid abdominal breathing. Mats, blankets, and blocks are used to support poses and minimize pain upon extension. Specified modifications are used for fatigue (e.g., breathing practices), pain (e.g., use of two chairs), lymphedema (e.g., use of forward bends sliding hands along legs rather than raised arms), anxiety (e.g., eyes open during meditation), and other conditions. The instructor is certified, bilingual, and has ample experience working with cancer patients. Due to the gentle and simple nature of the Yoga exercises, the integration of new students with more experienced students has not posed any barriers to the flow of the class. At the initial class, patients are instructed to practice the Yoga techniques at home daily, and given an audiotape or CD for guidance. The audiotape/CD, developed during the pilot phase in a recording studio, consists of the instructor going through a complete Yoga class in English or Spanish as taught in the intervention. Necessary modifications to the Yoga protocol to address specific physical limitations have been made by Dr. Shah to accommodate the range of diagnoses and treatments. A detailed description of the protocol including specific poses and breathing practices, modifications, and use of props follows.

Overview: The class contains the following components: Warm Ups, Poses/asanas as explained with proper modifications for those who need it, Deep Relaxation/Yoga Nidra, Pranayama/Breathing practices (two practices) and Meditation.

The session starts with a brief initial period of "centering". Each participant sits in a chair, covered by a blanket. (Mats are substituted for chairs for those who are physically able and comfortable to sit on the floor). They assume a comfortable position, as facilitated by the instructor. They are instructed to notice the breath first, then notice the mind, and then slowly deepen the breaths. This whole process takes about five minutes.

a. Simple Yogic Stretching/Warm-ups: (Duration: 5-15 minutes)
This involves very simple movements involving all joints in the body one after another e.g. wrist rotation, knee flexion and extension, etc. It starts with either upper or lower extremities. It involves all joints in hand, elbow, shoulder, neck, spine, hip, knee and foot. Initially, movements are done only a few times at each joint, usually about 5 times. Gradually, this is increased to 10-25 times at each joint. Degree of exercise here is limited such as to make sure that patients feel fresh at end and not exhausted.

After Yogic stretching, there is a period of Deep Relaxation (Yoga Nidra or Yogic Sleep), lasting about 15-20 minutes. This will prepare participants for the next stage i.e. Pranayama and Meditation. During this stage, the participants are lying supine with legs spread apart, keeping about one foot distance between them, and arms by the side of the body with hands supine (Shavasana or Relaxation Pose). After this, instructor guides them through the process involving alternate tensing and relaxing of each body part starting from feet up. They are asked to observe their breath passively after this, but not to take deep breaths actively.

Next, the instructor guides the participants through a set of Asanas/ Poses with proper modifications: Modified sun salutation on chairs, Cobra/Bhujangasana, Leg Stretches or Half Locust and Locust/Ardha Salabasana, modified Bow/Dhanurasana, or Dhanurasana for those who can do it.

Forward Bends: Head to Knee Pose/ Janusirshasana, forward bend/ Paschimotanansana, and Half Spinal Twist/Ardha Matsyendrasana.
Other poses include Modified Warrior II, modified Triangle on chairs.

b. Pranayama (breathing exercises): (Duration: 2-10 minutes)

The type of pranayama that is used for this study is known as: Naadi Suddhi [Naadi = channels i.e. blood and lymphatic vessels and nerves; Suddhi = to clean ] . This involves alternate nostril breathing in a specified manner. First, the participants sit in a comfortable position with back straight as much as possible (pillows are used for back support if required), with their hands in Pranayama Mudra (tip of Index and Middle finger at root of Thumb). This is done in stages. First, they are taught three stage Yogic breathing/Deerga Swasam (abdominal breathing). In this breathing method, during inhalation, expansion of abdomen occurs first, followed by lower parts of the lung and lastly upper parts of the lung. Exhalation is reverse with exhaling air from upper lung first, then lower lung and lastly abdomen. This is the recommended type of breathing pattern during all Yoga procedures.

Now alternate nostril deep breathing is taught. Participants will start breathing with left nostril while closing right nostril with right hand. After a deep inhalation, they close left nostril with right hand and start exhaling through right nostril. Once exhalation is complete, they inhale through right nostril, then close it with right hand and exhale through left nostril. This is one cycle. Exhalation is through the right nostril at the end of session. Breathing is slow, deep and gentle. Length of inhalation and exhalation is equal in an individual patient but would vary among different patients depending upon
their comfort level and vital capacity. Number of cycles will be slowly increased from initially 2 to 5-10 cycles. Throughout the procedure, participants will be asked to focus on their breathing.

Once patients are comfortable with above regimen, the ratio of inhalation : exhalation is changed to 1 : 2, i.e. exhalation would be twice as long as inhalation. This is done by counting e.g. up to 4 for inhalation, and then up to 8 for exhalation. This number is slowly increased as well, depending upon each patient’s comfort level.

Note: there is no Kappalabhati /Rapid abdominal breath practice whatsoever.

Benefit is expected at each stage, but those who would be able to do more (although while maintaining comfort) will benefit more. Straining at any stage to do more at the expense of comfort is not likely to benefit.

c. Meditation: (Duration: 5-15 minutes)

This involves sitting in a comfortable position and following a series of initial instructions by Yoga instructor to achieve a state of relaxation. This is done in stages. At the initiation, patients sit in a comfortable position and keeping the back straight as much as possible (pillows are used for back support if required), with their hands in Gyan Mudra (Tip of Index finger resting at the root of Thumb). They are asked to notice their breathing trying to direct all their attention to only breathing. They are instructed not to concentrate on it but rather to attend to it passively. They are asked to watch their breath flowing in and out, as a passive observer without participating in the process of breathing.

Another option given to them is to repeat a "mantra". A mantra is a word which if repeated, sets in a stage of relaxation and healing vibrations. Some examples are Om, Hari Om, or Om Shanti, which literally means 'let there be peace', or Soham meaning 'that I am' (suggesting oneness with the Supreme Being). Later, patients can link breathing and repeating mantra. Both methodologies are widely accepted. Still another option offered to those who are not comfortable with either mantra or focusing on breath, is to repeat a word like Love, Peace, One etc. This method has also been used widely. Similar to the concept described above for attending to the breath, participants are asked to repeat the mantra or word passively without trying to concentrate on it. The session ends with a brief period of relaxation and deep breathing. Total duration will be 30-60 minutes.
A more detailed listing of the order of the seated-yoga class is as follows:

1. Open with breathing, then deep breathing
2. Eye Movements
3. Shoulder rolls, hand rolls, head rolls, feet rolls.
4. Cat and Cow
5. 3 Sun Salutations
6. Cobra
7. One Leg Lifts or Half locust
8. Both legs lift or Locust
9. Bow, boat
10. Forward bend over right leg Janusirhasana, then over left leg.
11. Forward Bend over both legs Paschimotanasana
12. Half Spinal Twist
13. Deep Relaxation - Most have at least 10 minutes of complete silence
14. 3 Part Deep Breathing
15. Alternate Nostril Breathing at least 7 minutes, if possible 10 minutes or more
16. Meditation at least 5 minutes.
17. Closing of the class

Modifications for safety and various medical conditions:

The class is not a vinyasa (flowing from pose to pose) rigorous practice. It is an Integral Yoga based slow moving meditative practice. The participants rest for a few breaths after each pose. They have the opportunity not only to rest, but also to feel and absorb the effects of what they have just done. Besides it is always encouraged to practice at their level of comfort even after modifications have been done. The class is not rigid about sitting quietly and practicing pranayama immediately. Every part is introduced to new students at the pace they need. While more experienced people can do everything else instructed, new participants are given the freedom to observe, absorb and then feel the effects of the practice.

**Lymphadema/arm pain:**
Depending on each individual's ability to move, poses are modified for each persons specific needs. If a participant for example cannot raise the arms because of pain or motion of the arms is limited for Paschimotanasana/Forward Bend Pose, then s/he is encouraged to just slide the hands on the floor or along the legs as the body bends forward.

**Abdominal pain:**
If discomfort or pain is felt on the abdominal area they can sit on blankets against the wall and bend the legs and just relax the head forward, arms relaxed and hands relaxed.
on or toward the floor. Or the person can sit on a chair bending the legs, knees toward the ceiling and feet resting on another chair in front, with the arms relaxed as well.

Fatigue:
For fatigued participants they are advised and encouraged to first begin to have the most comfortable seated position usually on a chair and begin to focus on the breath. They learn the first, or the first two steps of Deerga Swasam/Deep Three Part Breath. If they can do some movement then modifications to movements will be taught and are always encouraged to rest at any time they need to.

Anxiety:
Individuals with anxiety may have difficulty with the pranayama or even sitting quietly in meditation if there is not previous experience with meditation. For example, if someone cannot sit quietly with eyes closed, that person can open the eyes and gaze at a particular point comfortably. With eyes open they can observe the natural rhythm of the breath. For meditation the same is applied and as Sri Patanjali explains in his book Yoga Sutras of Patanjali, book 1.39 “Or by meditating on anything one chooses that is elevating”. Participants are given that choice again with eyes closed or open. Some new practitioners due to some or the entire practice, particularly after Yoga Nidra/Deep Relaxation can feel more relaxed and meditation can be easier.

Use of Props:
Props are widely used by many yoga schools. In our practice we used them effectively and safely in class, and depending on the individual’s ability to move, poses are modified for his/her specific needs. To ensure participants comfort for example, in Janusirshasana/Head to Knee pose: If a person is able to sit on the floor yet unable to stretch the leg in front, then a rolled blanket is placed under the extended knee. Likewise if a person’s lower back feels tight or in discomfort, then she/he will sit on properly folded blanket/s, with a blanket or a block under the bent leg and a rolled blanket under the extended knee to make it easy on the body. If a participant cannot sit on the floor they are encouraged to sit on chairs, and seated on blankets if needed.
The Following More Advanced Asanas/Pranayama Could Be Used Under These Specified Circumstances Only:

For participants who are:
- Not on chemotherapy or radiation therapy
- Did not have surgery in the last 6 months, and
- Regular participants in the yoga class for at least 3 months

a) Some standing poses including sun salutations, warrior (but no one-legged stands)

b) Faster breathing exercises (Slow Kippala Bhati) whereby patient would build up from 5 breaths to 20 breaths over a period of time.

c) Adding retention to the alternate nostril breathing from 1-3 seconds, building up over to 5 seconds over time.