

# Yoga in War and Peace

Bhagwan A. Bahroo, M.D., F.A.P.A.

24 October 2019



# Disclosures

- Nothing to disclose

# Objectives

- Yoga is a pathway for higher self-awareness and self-discipline. It promotes better physical and mental health. It helps improve social connectedness and helps integrate spirituality.
- The goal is to obtain a better understanding of Yoga and how we can help ourselves and our patients lead a more productive, peaceful and harmonious existence.

# What is Yoga?

- Traditional physical and mental discipline, associated with meditative practices.
- Helps attain a higher level of self-awareness, balance, and strength.
- Term is derived from the Sanskrit root "yuj," meaning "to control, to yoke or to unite".
- May be possibly derived from "yujir samadhau," meaning "contemplation" or "absorption."

# Branches of Yoga

- Rāja Yoga (self-control)
- Karma Yoga (action, service)
- Jnana Yoga (knowledge)
- Bhakti Yoga (devotion)
- Hatha Yoga (vitality)
- Tantra Yoga (rituals, desire & pleasure)

# Raja Yoga explained (1)

- Patanjali's (150 BCE) "Ashtanga (eight-limbed) Yoga":
- Yama (the five abstentions): non-violence, non-lying, non-covetousness, non-sensuality, and non-possessiveness
- Niyama (the five observances): purity, contentment, asceticism, self-study and devotion
- Asana (seat): refers to the seated position used for meditation
- Pranayama (control of the breath): interpreted as control of the life force.

# Raja Yoga explained (2)

- Pratyahara (abstraction): withdrawal of the sense organs from external objects.
- Dharana (concentration): fix the attention on a single object.
- Dhyana (meditation): intense contemplation of the nature of the object of meditation.
- Samādhi (enlightenment): merging consciousness with the object of meditation

# Hatha Yoga explained (1)

- Hatha (“forceful” or Yoga of activity) Yoga was described by Yogi Swatmarama in 15th century India.
- Described as Sun (ha) and Moon (tha), or Yoga of balance
- Hatha Yoga differs substantially from the Raja Yoga of Patanjali in that it focuses on "shatkarma," the purification of the physical body leading to the purification of the mind, and vital energy.

# Hatha Yoga explained (2)

- Compared to the seated asana, or sitting posture of Raja yoga, Hatha yoga marks the development of asanas into the full body postures
- Along with its many modern variations, this is the style that many people associate with the word "Yoga" today.

# Getting started

- Nothing much is needed to practice Yoga
- Healthy attitude - a big heart and a small ego
- Wear loose fitting clothes
- Select a quiet, small, secluded spot
- Bring a mat, a blanket and a pillow
- Be on an empty stomach or 2 hours after meals

# Basic instructions

- Yoga in the morning is an excellent way to revitalize the mind and body
- Breathing and Meditation Exercises at night helps induce a deep, restful sleep
- Sessions need not be lengthy, but should be done daily
- Start with easy positions to condition your body for the more difficult exercises that follow
- 15 minutes of exercises and 15 minutes of Breathing and Meditation each day are recommended
- Concentrate on each movement. The process of moving is as important as attaining a given position
- Yoga isn't a competitive sport, and the extent of the stretch is less important than the technique.
- Each asana may be repeated up to 3 times, but it is better to perform a posture once correctly than repeating it 3 times quickly or sloppily.
- Poses should be attained in the prescribed order, since the routine is meant to help balance the different muscle groups.
- Do not strain yourself. Pause when you feel pain or fatigue. Relax in between exercises

# Proper Breathing Technique

- Start with breathing slowly and deeply, concentrating, and making yourself centered.
- Body movements and breathing must be coordinated such that they are one and the same. Breathing will also be the guide when to start or stop the exercise.
- Getting into a pose, holding it, and getting out of it must be a continuous and graceful act.

# Session consists of -

- Starting Positions: Standing, Sitting, Supine, or Prone
- Types of Positions:
  - Stretches
  - Bends - Forward, Back, Side
  - Twists
  - Inversions
  - Balance
- Ending Position: Relaxing

# 5 Categories of Brain Waves:

- 1. Gamma State (30-100 Hz) - state of hyperactivity in the brain and active learning. If overstimulated, it can lead to anxiety.
- 2. Beta State (13-30 Hz) - is associated with the alert mind-state of the prefrontal cortex. This is a state of the “working” or ‘thinking mind’: analytical, planning, assessing and categorizing.
- 3. Alpha State (9-13 Hz) - Brain waves start to slow down. We are lucid, reflective, have a slightly diffused awareness and at peace. The hemispheres of the brain are more balanced (neural integration).
- 4. Theta State (4-8 Hz) - We are able to begin meditation. The verbal/thinking mind transitions to the meditative/visual mind. We achieve stronger intuition, more capacity for wholeness and complicated problem solving. It is often felt as a drowsy state.
- 5. Delta State (1-3 Hz) - Tibetan monks that have been meditating for decades can reach this in an alert, wakened phase but most of us reach this final state during deep, dreamless sleep.
  
- [https://www.huffpost.com/entry/how-meditation-works\\_b\\_4702629](https://www.huffpost.com/entry/how-meditation-works_b_4702629)

# Types of Meditation

- Transcendental
  - chant, focus to rise above negativity
- Heart-Rhythm
  - concentrate on heart, emphasis on breath
- Kundalini
  - breath flowing up thru energy centers
- Guided Visualization
  - imagine relaxation & positivity
- Qi Gong
  - breathing, movement and meditation
- Zazen
  - “seated meditation”, self-guidance, non-judgemental
- Mindfulness
  - let the mind wander, accept the thoughts and understand the present.

# Benefits for mind and body

- Reduces Stress
- Promotes Emotional Well-being
- Improves Concentration
- Contributes to a Healthier Life-style
- Increases Self-awareness
- Increases Happiness
- Increases Acceptance
- Slows Aging
- Benefits Cardio-vascular and Immune Health
- Practiced anywhere and is Free

## Health Impacts of Yoga and Pranayama: A State-of-the-Art Review

Pallav Sengupta

International Journal of Preventive Medicine. 2012 July; 3(7): 444-458

- Yoga couples sustained muscular activity with internally directed focus, producing a temporary self-contemplative mental state.
- It triggers neuro-hormonal mechanisms that bring about health benefits, evidenced by the suppression of sympathetic activity.
- Thus, it reduces stress and anxiety, improves autonomic and higher neural center functioning and even, as shown in some studies, improves physical health of cancer patients.
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3415184/>

## Yoga-plus exercise mix promotes cognitive, affective, and physical functions in elderly people

[Hishikawa N](#), [Takahashi Y](#), [Fukui Y](#), [Tokuchi R](#), [Furusawa J](#), [Takemoto M](#), [Sato K](#), [Yamashita T](#), [Ohta Y](#), [Abe K](#).  
[Neurology Research 2019 Oct 5: 1-7 \(epub ahead of print\)](#)

- Yoga-plus improved cognitive, affective, ADL, and physical functions in an elderly population, particularly among below-baseline individuals, indicating the benefits of dementia prevention among elderly individuals
- <https://www.ncbi.nlm.nih.gov/pubmed/31588880>

# Yoga: Balancing the excitation-inhibition equilibrium in psychiatric disorders.

[Mehta UM, Gangadhar BN.](#)

[Progress in Brain Research 2019; 244:387-413 \(epub 2019 Jan 3\)](#)

- Yoga improves GABA-mediated cortical-inhibitory tone and enhances peripheral oxytocin levels.
- This may have a more controlled downstream response of the hypothalamic-pituitary-adrenal system by means of reduced cortisol release, hence a blunted sympathetic response to stress.
- Animal and early fetal developmental studies suggest an inter-dependent role of oxytocin and GABA in regulating social behaviors.
  
- <https://www.ncbi.nlm.nih.gov/pubmed/30732846>

## Effects of *Bhramari Pranayama* on health – A systematic review

[Maheshkumar Kuppusamy](#), [Dilara Kamaldeen](#), [Ravishankar Pitani](#), [Julius Amaldas](#), and [Poonguzhali Shanmugam](#)

Journal of Traditional and Complementary Medicine 2018 Jan; 8(1): 11-16

- The effect of *Bhramari Pranayama* has parasympathetic predominance and this was the basis for their results derived, namely;
  - reduction in heart rate and BP,
  - reduction in response to cold pressor test,
  - improvement in cognition,
  - reduction in irritability in tinnitus,
  - favorable EEG changes and
  - reduction in stress levels.
- 
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5755957/>

## Assessment of the Effects of Pranayama/Alternate Nostril Breathing on the Parasympathetic Nervous System in Young Adults

[Anant Narayan Sinha](#), [Desh Deepak](#), and [Vimal Singh Gusain](#)

Journal of Clinical Diagnostic Research. 2013 May; 7(5): 821–823.

- a gradual shift of the autonomic equilibrium towards a relative parasympathic dominance due to decrease in the sympathetic activity.
  - produced beneficial changes in the emotional state.
  - the regular practice of slow breathing increased the parasympathetic tone and a decreased sympathetic activity improved the cardiovascular and respiratory functions
- 
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3681046/>

## Meditation: Process and effects

[Hari Sharma](#)

[Ayu](#). 2015 Jul-Sep; 36(3): 233–237

- Research has confirmed a myriad of health benefits associated with the practice of meditation.
- These include stress reduction, decreased anxiety, decreased depression, reduction in pain, improved memory. Benefits include reduced blood pressure, heart rate, lactate, cortisol, and epinephrine; decreased metabolism, breathing pattern, oxygen utilization, and carbon dioxide elimination; and increased melatonin, dehydroepiandrosterone sulfate (DHEA-S).
- Meditation increases regional cerebral blood flow in the frontal and anterior cingulate regions of the brain, increases efficiency in the brain's executive attentional network. Meditation experience is associated with an increase in gray matter in the brain. Meditation decreases sympathetic overstimulation and reduces cholesterol and smoking.
- Meditation and Yoga practices positively affect gene expression. Meditation and Yoga practices improve telomerase activity and telomere length. A study investigating the effect of meditation on the aging process showed that long-term meditators have a significantly younger biological age compared to short-term meditators and controls.
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895748/>

# The neurobiology of Meditation and its clinical effectiveness in psychiatric disorders – Katya Rubia

Biological Psychiatry Vol. 82, issue 1, Sept 2009, pp 1-11

- Physiological evidence shows a reduction with Meditation of stress-related autonomic and endocrine measures
- Neuroimaging studies demonstrate the functional up-regulation of brain regions of affect regulation and attention control.
- Clinical studies show some evidence for the effectiveness of Meditation in disorders of affect, anxiety and attention.
  
- <https://www.ncbi.nlm.nih.gov/pubmed/19393712>

# Meditation and Psychiatry

Michael McGee

Psychiatry (Edgmont) 2008 Jan; 5(1): 28-41

- Understanding meditation as a complex act that consists in part of attending and abstaining helps us to understand how the many positive consequences of meditation occur.
- Meditation can thus be recast as an individual, formal practice of actions that are also practiced in psychotherapy.
- From this perspective, it becomes obvious that the two are “technically compatible and physically reinforcing.”
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719544/>

# What is your impression of this video?

- <https://www.bing.com/videos/search?q=laughter+in+a+train+scene&&view=detail&mid=E318185125B0763BB0C7E318185125B0763BB0C7&&FORM=VDRVRV>

# Laughter

- Humans are the only species that can laugh : “Hyenas do not laugh”
- Laughing makes a person feel good: “laughter is the best medicine”
- Jokes are narrated for that purpose; Sitcoms are created for making us laugh
- It is a complex response that involves some of the same skills used for problem solving
- Laughter is not Humor : it is a physiological response to Humor
- Encyclopedia Britannica : "rhythmic, vocalized, expiratory and involuntary actions“

# Laughter

- Behavioral neurobiologist and pioneering laughter researcher Robert Provine suggests that humans have a "detector" that responds to laughter by triggering other neural circuits in the brain, which, in turn, generates more laughter.
- One of the key features of natural laughter is its **placement in speech**, linguists say.
- Laughter almost always occurs during pauses at the end of phrases.
- Experts say this suggests that an orderly process (probably neurologically based) governs the placement of laughter in speech and gives speech priority access to the single vocalization channel.
- This strong relationship between laughter and speech is much like punctuation in written communication and that is why it is called the **punctuation effect**.

# Effects of Laughter

- Respiratory system is upset by the epiglottis half-closing the larynx, so that air intake occurs irregularly, making you **gasp**.
- In extreme circumstances, the **tear ducts** are activated, so that while the mouth is opening and closing and the struggle for oxygen intake continues, the face becomes moist and often red.
- Laughter may lead to hiccups and coughing, thus clearing the respiratory tract by dislodging mucous plugs.
- Laughter increases the concentration of **salivary immunoglobulin A**, which defends against infectious organisms entering through the respiratory tract.
- Blood pressure is lowered, and there is an increase in vascular blood flow and in oxygenation of the blood, which further assists healing.

# Effects of Laughter on the Brain and EEG

- The **left side of the cortex** (of the forebrain) analyzes the words and structure of the joke.
- Brain's **frontal lobe**, which is involved in social emotional responses, becomes very active.
- **Right hemisphere of the cortex** does out the intellectual analysis required to "get" the joke.
- Brainwave activity then spreads to the **sensory processing area of the occipital lobe**.
- Stimulation of the **motor sections** evokes physical responses to the joke.
- Within four-tenths of a second of exposure to something potentially funny, an electrical wave moves through the **cerebral cortex**, the largest part of the brain, as seen on the EEG. If the wave takes a negative charge, laughter results. If it maintains a positive charge, no response occurs.

# Laughter and the Immune System

- Laughter reduces levels of certain stress hormones. These stress hormones
  - suppress the immune system
  - increase the number of **blood platelets**
  - raise blood pressure.
- During laughing,
  - natural killer cells that destroy tumors and viruses increase,
  - so do **Gamma-interferon** (a disease-fighting protein),
  - **T-cells**, which are a major part of the immune response, and
  - **B-cells**, which make disease-destroying antibodies.

# 3 Theories of Laughter

- The **incongruity theory** suggests that humor arises when logic and familiarity are replaced by things that don't normally go together. A joke becomes funny when we expect one outcome and another happens.
- The **superiority theory** comes into play when we laugh at jokes that focus on someone else's mistakes, stupidity or misfortune.
- The **relief theory** is the basis for a device movie-makers have used effectively for a long time. In action films or thrillers where tension is high, the director uses comic relief at just the right times.

# Laughter prescription

[William B. Streaan](#), PhD

Canadian Family Physician 2009 Oct; 55(10): 965-967

- It was not until 1995 that laughter as an exercise, or *laughter yoga*, emerged systematically through laughter clubs.
- With increasing recognition, one might expect that there would be growing application of laughter and humour for their complementary and alternative medical benefits.
- They are easy to prescribe and there are no substantial concerns with respect to dose, side effects, or allergies.
- It seems, however, that the medical community has been reluctant to embrace and support laughter for health.
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762283/>

# Three Decades Investigating Humor and Laughter: An Interview With Professor Rod Martin - [Rod Martin](#) and [Nicholas A. Kuiper](#)

[European Journal of Psychology 2016 Aug; 12\(3\): 498-512](#)

- Since the start of the 21st century, the investigation of various psychological aspects of humor and laughter has become an increasingly prominent topic of research.
- This growth can be attributed, in no small part, to the pioneering and creative work on humor and laughter conducted by Professor Rod Martin.
- Dr. Martin describes the conceptualization, development and use of the Humor Styles Questionnaire, along with suggestions for future research and development.
- In doing so, he also discusses the three main components of humor (i.e., cognitive, emotional and interpersonal), as well as the distinctions and similarities between humor and laughter.
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4991054/>

## **The Laughter Prescription - A Tool for Lifestyle Medicine**

[Dexter Louie](#), BA, [Karolina Brook](#), MD, and [Elizabeth Frates](#), MD

[American Journal of Lifestyle Medicine 2016 Jul-Aug; 10\(4\): 262-267](#)

- Laughter is a normal and natural physiologic response to certain stimuli with widely acknowledged psychological benefits.
- However, current research is beginning to show that laughter may also have serious positive physiological effects for those who engage in it on a regular basis.
- Providers who prescribe laughter to their patients in a structured way may be able to use these natural, free, and easily distributable positive benefits.
- <https://www.ncbi.nlm.nih.gov/pubmed/30202281>

## Humor, laughter, learning, and health! A brief review

[Brandon M. Savage](#), [Heidi L. Lujan](#), [Raghavendar R. Thipparthi](#), and [Stephen E. DiCarlo](#)

Advances in Physiology Education – vol 41, issue 3, Sept 2017, pp 341-347

- Human emotions, such as anxiety, depression, fear, joy, and laughter, profoundly affect psychological and physiological processes.
- Laughter is part of a universal language of basic emotions that all humans recognize.
- Health care providers may utilize the power of laughter to improve health and enhance teaching and learning.
- When used effectively, humor is documented to build relationships and enhance performance.
- Specifically, humor improves student performance by attracting and sustaining attention, reducing anxiety, enhancing participation, and increasing motivation.
- Humor stimulates multiple physiological systems that decrease levels of stress hormones, such as cortisol and epinephrine, and increase the activation of the mesolimbic dopaminergic reward system.
- <https://www.ncbi.nlm.nih.gov/pubmed/28679569>

# Some Resources

- <http://www.abc-of-yoga.com>
- <https://www.indianmirror.com/games/gam8.html>
- <http://www.ashtangayoga.info>
- <http://www.yogapoint.com>
- <https://science.howstuffworks.com/life/inside-the-mind/emotions/laughter.htm>
- <https://visualmeditation.co/7-types-of-meditation/>
- [https://www.huffingtonpost.com/2014/09/19/meditation-benefits\\_n\\_5842870.html](https://www.huffingtonpost.com/2014/09/19/meditation-benefits_n_5842870.html)