

Original Concept

Yogapathy: Psychosomatic Preventive and Curative Medicine - The Need of the Day

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ABSTRACT

The theme of this paper is the development of Yogapathy as mind-body medicine, to be employed along with the conventional Allopathic medicine to constitute a holistic integrated medical system.

Herein, we are presenting the highlights of the paper.

I. Allopathy vs. Yogapathy

Allopathy refers to the conventional medical system in which the medical doctors and other healthcare professionals (such as nurses, pharmacists, and therapists) treat symptoms and diseases by using medications, radiation, or surgery.

Yogapathy connects the mind and cakras, cakras with the endocrine systems, and endocrine systems with the body organs. Yogapathy thereby influences both mental and physical health, and it promotes holistic wellbeing.

II. Yogapathy Roots: Cosmological Cycle of Life creation and Evolution

In the Cosmological Cycle, Cosmic Consciousness expresses into the Cosmic Mind, and then into the five fundamental factors. This leads to (i) the occurrence of the Big Bang, as the starting point of the universe, (ii) the formation of visible and invisible universes, (iii) the creation of life by microvita (emanations from the Cosmic mind), and the formation of primitive minds, and (iv) life evolution into plants, animals, and human beings.

III. Yogapathy Physiology and Biopsychology

Yogapathy connects the mind and the cakras with the body organs through the endocrine glands, So for maintaining this psychosomatic health, Meditation has two components involving (i) stimulating our mind with ideation on the all-pervading Divine Entity (God) by means of appropriate mantras, by which the mind gets liberated from its embedded impressions (samskaras) and one can become divine; (ii) having the Divine Entity put divine energy into the body, by which we can energize the cakras (with appropriate mantras) and get the associated endocrine glands stimulated, to release hormones for befittingly influence and control the processes of the body organs. In this way, Yogapathy opens up a new modality of medicine, involving both preventive care and curing of organ disorders.

IV. Yogapathy Meditation Systems for Psychosomatic Health and Self-Realization

Meditation involving mind ideation on divine Consciousness, promoting mind liberation: IshvaraPranidhana.

Inviting in Pranah, Cosmic vital energy, by breathing and promoting sanctification: Pranayama

Meditation of divine Consciousness on the Cakras, promoting body and mind healing: Cakra Shodhana.

V. Neuroplasticity characterization of Yogapathy Meditative State by EEG

The effectiveness of meditation can be characterized in terms of the enhancement of the percentage of (i) EEG alpha waves (8–12 Hz) relative to beta waves (12.5 and 30 Hz), associated with a more relaxed mental state, and (ii) theta waves (4–8 Hz) relative to alpha and beta waves, associated with deeply relaxed mental state and higher consciousness feeling.

VI. Yogapathy Physiology and Biomechanics of Asanas

The practice of yoga asanas creates balance in the body's glandular system and strengthens the immune system, to achieve physico-psychic balance. In addition to their curative effect, the regular practice of yoga asanas acts as a preventive measure against sickness. By strengthening the immune system and aiding in the break-down and expulsion of toxins, we can maintain good health.

VII. Effects of Meditation on the Brain, and in enhancing learning ability

Meditation boosts the alpha brainwaves, the predominant state for learning, studying, memorizing, and recollecting large sums of information. Now it is known that one side of the brain is more mathematical and scientific (left), while the other half is more creative and intuitive (right). Meditation can promote whole brain synchronization and enhance the learning ability.

VIII. Meditation Benefits for the Body, Mind, and Spirit

Effects on Body: boosts immune system, lowers blood pressure, eases inflammation, and reduces heart attack risk.

Effect on Mind: increases brain gray matter, cultivates willpower, builds focus and concentration, boosts cognitive function.

Effects on Spirit: builds self-knowledge helps satisfactory relationships, increases compassion, and enhances empathy.

IX. Astaunga Yoga

Astaunga Yoga is the pathway of internal purification for self-realization. It consists of the following eight limbs and practices: Yama (moral codes to control actions related to the external world) and Niyama (self-regulation for self-purification), Asanas (poses to improve posture and flexibility, health and body function), Pranayama (breath control of vital energy), Pratyahara (sense control by mind withdrawal from external objects), Dharana (mind concentration at the prescribed cakra), Dhyana (union of unit mind with cosmic mind), Samadhi (absorption into the supreme consciousness).

X. Integrated Yogapathy and Allopathy Medical System

Based on the above-described benefitting effects of Yogapathy, it needs to be part of the medical system. We are hence proposing a new medical system integrating Yogapathy and Allopathy. So we are now proposing the curriculum of the modern Yogapathy—Allopathy Integrated MD Medical System.

Curriculum:

Foundation Courses in Mathematics, Physics, Chemistry, Biology.

Years 1 and 2: based on first two years of the basic Allopathic MBBS system, with some transformations into quantitative anatomy and quantitative physiology.

Years 3 and 4: based on Yogapathy science and practices.

Years 5 and 6: based on final two years of Allopathic MBBS system.

Year 7: Internships in Yogapathy and Allopathy.

KEYWORDS: Yogapathy, Allopathy, Physiology, Psychosomatic health, Yoga, Meditation, Asanas, Cakras, Pranayama, STEM format of medicine

THEME OF THE PAPER

We have developed Yogapathyasa new system of mind-body medicine. Herein, we are describing the different aspects of Yogapathy. We start with (i)comparing Yogapathy with Allopathy.

We then describe in detail (ii) YogapathyRoots, (iii) Yogapathy Physiology and Biopsychology, (iv) Meditation systems for psychosomatic health and self-realization, (v) Neuroplasticity characterization of the Meditative State by EEG, (vi)Yogapathy Physiology and Biomechanics of *Asanas*, (vii) Effects of Meditation on the Brain, and in enhancing learning ability, (viii)Meditation Benefits for the Body, Mind, and Spirit, (ix) *Astaunga Yoga*, and its eight limbs, as the pathway of internal purification for self-realization,

Finally, we provide (x) an Integrated Yogapathy and Allopathy Medical System, to constitute a new format of a holistic medical system.

I. Allopathy vs. Yogapathy

I.1 Allopathy

Allopathy refers to the universally adopted conventional medicine system in which the medical doctors and other healthcare professionals (such as nurses, pharmacists, and therapists) treat symptoms and diseases by using medications, radiation, or surgery. Allopathy is verily what can be considered as modern medicine. Healthcare professionals who practice allopathic medicine tend to take an evidence-based approach when they treat diseases. This means they try to follow current medical guidelines, and they may request several diagnostic tests before deciding on the best course of treatment. Allopathic doctors prescribe FDA-approved medications. Furthermore, the manufacturers of these drugs spend years developing and testing them via robust clinical trials to measure their effectiveness and safety.

The big benefit of allopathic medicine is its evidence-based system. This means each diagnostic tool and treatment regimen is the product of rigorous scientific research. Some medicines or drugs may not categorically be risk-free, despite undergoing rigorous clinical trials and approval processes. The FDA Trusted Source only considers a medication safe when the benefits outweigh the risks. Consequently, some people may experience side effects after taking prescription medications. Sometimes these side effects are minor, but they can also be serious on rare occasions.

Allopathy targets the affected organ. When we fall sick, taking medicines can provide healing and make us feel better. For treating our illness, medicines enable curing diseases and making us recover. Sometimes, surgery is also needed for treatment, such as coronary bypass surgery for treating poorly contracting left ventricle due to myocardial infarction caused by stenotic coronary arteries. The whole system of using

certain types of medications and carrying out specific surgical procedures is what is Allopathy. Allopathy has indeed been the most benefitting medical system in our times.

I.2 Yogapathy

Yogapathy connects the mind and *cakras*, *cakras* with the endocrine systems, and endocrine systems with the organs. Yogapathy thereby influences both mental and physical health, and promotes holistic wellbeing. The Yogapathy subtle body system comprises of (i) the *cakras* and the associated endocrine system, as depicted in **figure 1**, and (ii) the endocrine system and the associated organs, as depicted in **figure 2**.

The mind and brain are interrelated. Neurological disorders affect the mind, and psychic disorders affect the brain and our thinking. Yogapathy connects the mind and brain, promotes neuroplasticity, and serves as mind-body medicine. The nervous system is linked to the endocrine system. The hypothalamus of the brain connects these two important communication systems, and it is responsible for regulating the basic physiological needs and stress responses. Linking the mind and the physical body (or the organ systems) are subtle psychic energy centers or *cakras*, which control our mental propensities and behavioral expressions, as well as the organs through the endocrine glands. *Cakras* store the energy of thoughts and feelings, memories and experiences. They influence and direct our mindset and behavior, emotional health and actions. The life force in each *cakra* can be processed, transmitted, and released, so that we can consciously manifest what we want to call in and experience. The *cakras* are connected by subtle energy channels (or *nadis*), through which the vital (bioplasmic) energy (or *pranah*) is conceived to reach every part of the body. Both mental and physical health and behavioral response of the individual depend on the proper energy balance between the *cakras*, and thereby the functions of the endocrine and nervous systems. Disease is caused by an imbalance in this energy flow between the *cakras*, and the dysfunctions of the endocrine and nervous systems. *Cakra* based healing constitutes energizing the *cakras* and thereby the associated endocrine glands, whose hormonal secretions can then affect the organs.

II. YogapathyRoots: Cosmological Cycle of Life creation and Evolution

In the Cosmological Cycle, Cosmic Consciousness expresses into the Cosmic Mind, and then into the five fundamental factors. This leads to (i) the occurrence of the Big Bang, as the starting point of universe, (ii) formation of visible and invisible universes, (iii) creation of life by microvita (emanations from the Cosmic mind), and the formation of primitive minds, and (iv) life evolution into plants, animals, and human beings.

The Fundamental Entity: In this new Science paradigm, the foremost concept is that Cosmic Consciousness is the fundamental entity from which emanates the universe and life,

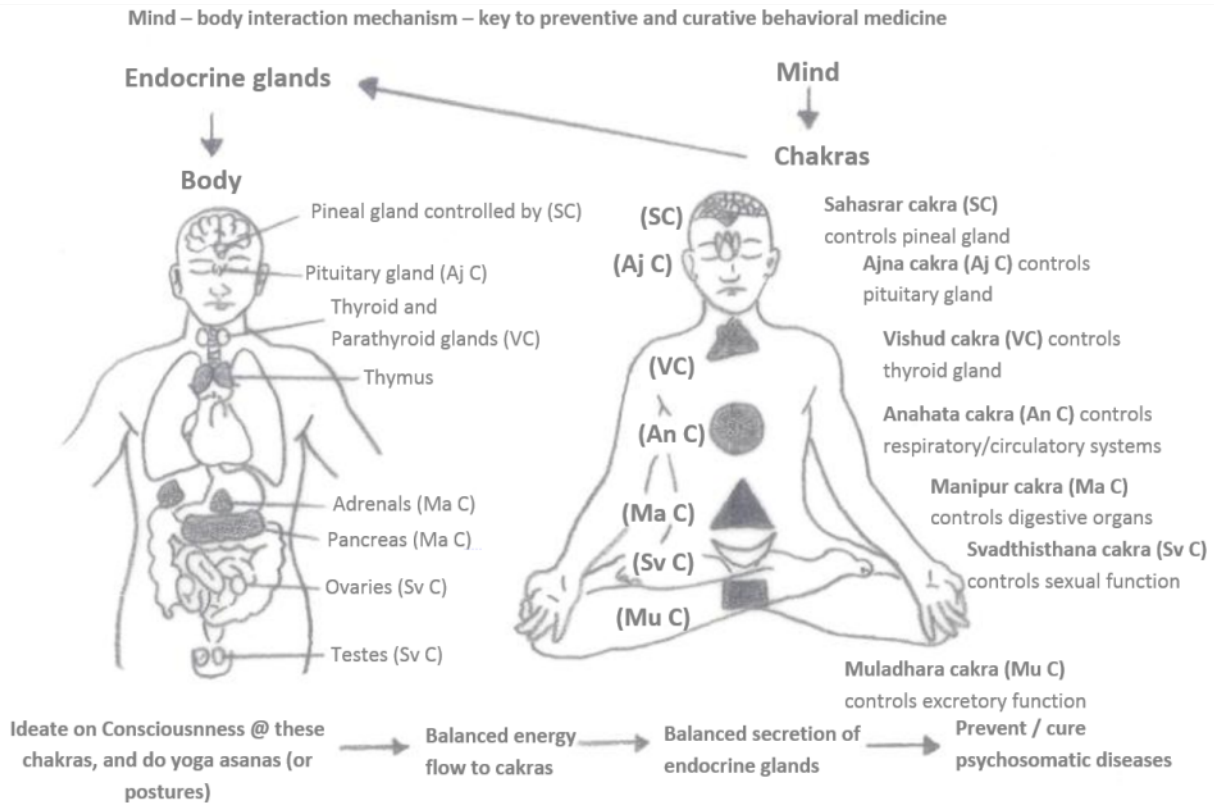


Figure 1: *Cakras* or Energy Centers and their association with the Endocrine Glands^{1,2}

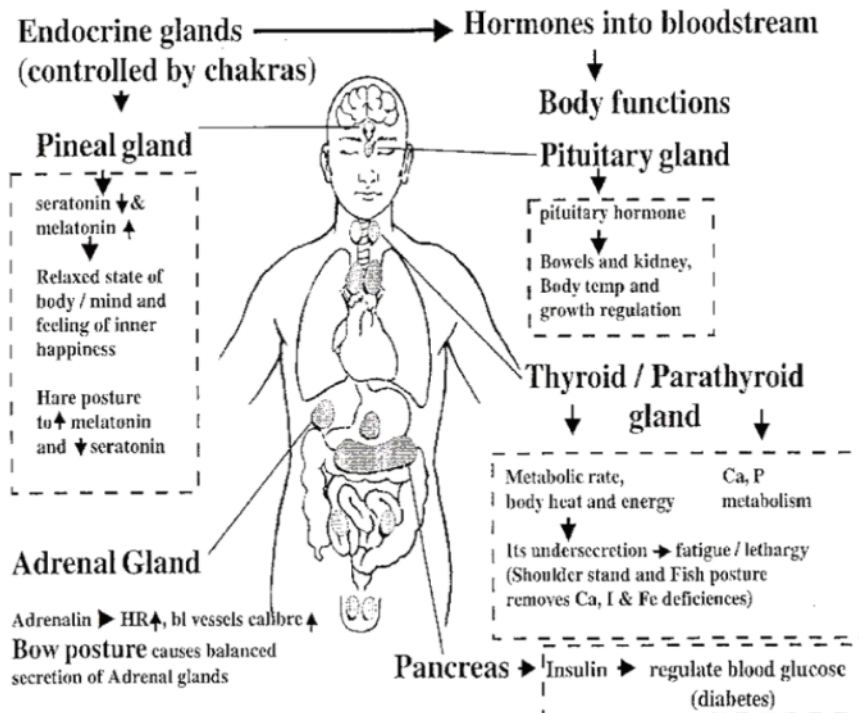


Figure 2: Effect of Endocrine glands controlled by the Cakras on the Body Organs

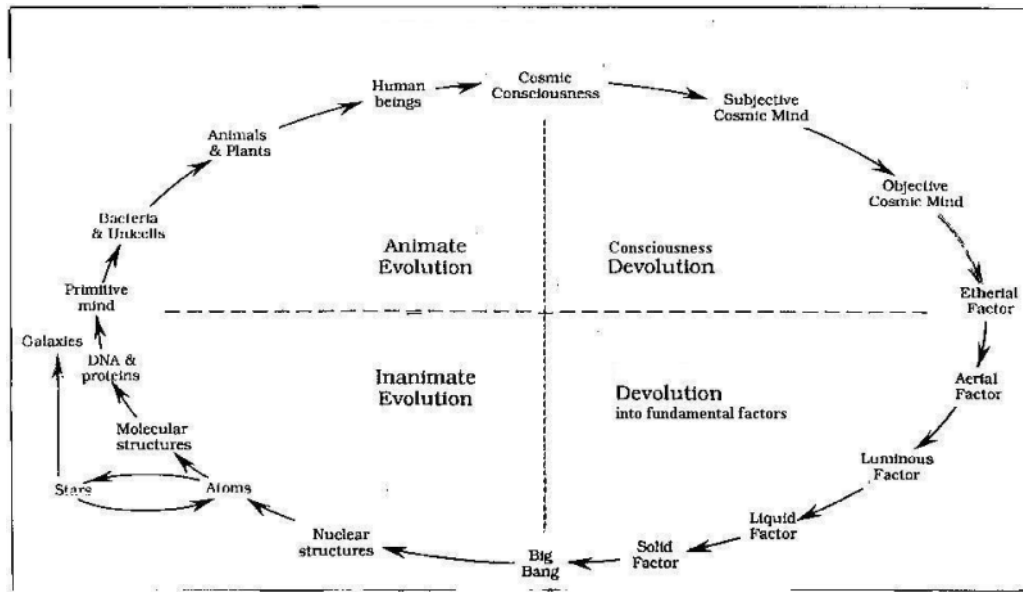


Figure 3: Cosmological cycle: Cosmic Consciousness to Cosmic Mind, and its expression into the five fundamental factors, resulting in (i) Big bang and Universe formation, (iii) formation of life and primitive structures, (iii) Plants, animals, and human beings

based on its Cognitive and Operative Principles. Starting from here, we embark on the trail of the Cosmological cycle (as illustrated in **Figure 3**),

Cosmic Mind and development of the Fundamental Factors - constituents of the Universe:

In Stage 1, Cosmic Consciousness gets expressed (through its Operative Principle) into the Cosmic Mind. Under the influence of the Operative Principle, the Cosmic Mind emanates microvita (the carriers of life in stars and planets), and gets expressed into the five fundamental factors (5FFs: ethereal, aerial, luminous, liquid and solid factors), providing the constituents of the universe. These five categories of elements (referred to as the 5FFs) are a spectrum of wave forms, characterized by their sensory attributes.

As the 5FFs get expressed, they form structures which are (i) visible if they contain all the 5FFs, and (ii) invisible if they contain only the ethereal, aerial and luminous factors. Now, as a result of the Operative Principle's pressure on these structures made up of all the 5FFs, a stage is reached when there is explosion of the physical structures. As a result of this explosion, the physical structures get disassociated into the five fundamental factors and their constituent solid structural portions explode into hot matter particles. This explosion corresponds to the Big Bang. This big bang explosion results in the formation of the visible universe of galaxies.

Big Bang and Universe formation: Following this explosion (Big Bang), nuclear matter (protons, neutrons, electrons, and other heavier particles) comes into existence, as the universe cools with expansion. Hydrogen and helium nuclei are formed,

and later complete atoms, eventually resulting in stars and galaxies. This is how the universe explodes into existence.

Now this big bang explosion of the solid segments of the physical structure, due to the resulting exterior force acting on the physical structures (formed from all the five fundamental factors: ethereal, aerial, luminous, liquid, and solid), results in the formation of the visible universe of galaxies. Likewise, from the disassociation of structures that are made up of only the other more subtler factors (such as the ethereal, aerial, and luminous factors), we could have the development of the invisible universe of dark matter and dark energy. This is perhaps how the invisible universe comes into being, which conventional physics is still unable to explain.

Formation of the Primitive mind: As we have stated above, the five categories of elements (referred to as the 5FFs) are a spectrum of wave forms, characterized by their sensory attributes. Now, working through these sensory attributes are subtle emanations of microvita from the Cosmic mind. So then, following the Big Bang, the matter structure (of fundamental particles) also contains billions of microvita, which have both objectivity (energy) and subjectivity (consciousness). They energize a disordered set of atoms (in an inorganic structure) by means of synthetic reactions, to develop an organized physical (organic) structure and manifest (albeit therefore) a biopsychic field, representing a primitive (unit) mind.

As the quantum of ectoplasmic mind-material keeps increasing, the inanimate physical structure concomitantly gets more and more energized into an animate (or life) structure, thereby providing the template of primitive life structures.

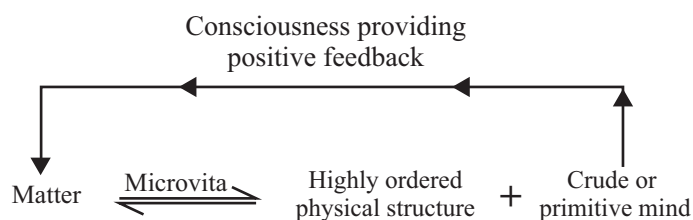


Figure 4: Emergence of a primitive mind and life-structure, through the energization of matter by microvita. The positive feedback keeps the forward reaction going, causing more and more development of ectoplasmic mind material

Then, in the process of adaptation of the organism to an external environment, the microvita augment the biopsychic field of the primitive mind, and by the process of positive feedback increases the complexity of the physical structure, as illustrated in **Figure 4**.

Life Evolution and Yogapathy: Further development of the created primitive mind of primitive organisms (unicellular organisms and bacteria) into more complex organisms and then into plants and animals occurs, due to the process of unfolding (or evolution) of unit consciousness and development of subtler layers of mind under the influence of Cosmic Consciousness. To express this development of mind, in turn requires more and complex nervous and anatomical structures. Eventually, the mind develops into a more complex and subtle mind of a human being. This is where Yogapathy starts, on how to evolve human beings into cosmic conscious beings.

III. Yogapathy Physiology and Biopsychology: Connecting the mind and *cakras*, endocrine and neurological systems, thereby influencing both mental and physical health, and promoting wellbeing

Yogapathy connects the mind and the *cakras* with the body organs through the endocrine glands, as illustrated in **figures 1 and 2**. So for maintaining this psychosomatic health, Meditation has two components involving (i) stimulating our mind with ideation on the all-pervading Divine Entity (God), by means of appropriate *mantras*, by which the mind gets liberated from its embedded impressions (*samskaras*), and one can become divine; (ii) having the Divine Entity put divine energy into the body, by which we can energize the *cakras* (with appropriate mantras) and get the associated endocrine glands stimulated, to release hormones for befittingly influence and control the processes of the body organs. In this way, Yogapathy opens up a new modality of medicine, involving both preventive care and curing of organ disorders. All these mechanisms are further explained.

III.1 Energy Centers (or *Cakras*) and Endocrine Glands, linking the Mind and Body

As indicated earlier, the mind and the physical body are linked by subtle energy centers called the *cakras*. The *cakras* are associated with and control specific endocrine glands, as depicted in **figure 1**. The *cakras* regulate organ function through these glands, by stimulating their hormonal secretions; this is how the *cakras* influence the body (**figure 2**). In the human mind, various thoughts are constantly emerging and dissolving. Behind these psychic phenomena are the underlying propensities formed according to the past psychic impressions on the mind. The propensities are expressed by the vibrational expression of the *cakras*, which in turn affect the endocrine glands through their hormonal secretions (**figure 1**).

Both the expression as well as the control of these propensities is dependent upon the *cakras*. Emotional stresses (such as anxiety and insecurity) are known to be responsible for diseases, such as coronary heart disease and even schizophrenia. When subject to stress, the endocrine glands release hormones into the bloodstream, which affect blood vessel caliber, digestion, metabolism, etc. For instance, when a person becomes extremely afraid, it affects the *Anahata Cakra* (refer to **Figure 1**), which can result in palpitations, inability to act decisively, and even a heart attack.

III.2 Mental Pain and Organ Dysfunction

In this era of increased mental (as opposed to physical) involvements and preoccupation, there is a rise in the prevalence of psychic ailments, neurological diseases, and mental depression. Just as excessive physical interactions and endeavors stress the corresponding physiological system, so also excessive mental interactions and endeavors stress the portions of the mind that perceive and do the work of perception. The ego associated with the "I exist portion" of the mind is what makes the 'doer' portion of the mind perform actions, which can result in outcomes that are either pleasant or painful and subsequently disappointing.

The mind has always something to ideate on; it must have objectivity. In daily life, the objectification of the mind resulting from harsh interactions and painful situations produces deformations of the mind. At times, these situations persist and the resulting feeling of helplessness, at not being able to alleviate or cope with the resulting painful deformations of the mind, produces mental pain and psychic ailments (due to imbalance in energy states of the *cakras*), also resulting in dysfunction of certain organ systems (due to imbalanced secretions of the endocrine glands).

So then, what is the remedy for the acute and chronic painful states of the mind, and concomitant psychological and physiological ailments, resulting from inimical interactions? This is dealt with in the next section.

III.3. Basis of Psycho-Somatic and Psycho-Behavioral Disorders

(1) Psycho-Somatic Linkage

Stress Related Psycho-somatic Disease: Stress expresses itself psycho-somatically. Somatically it expresses itself, for instance, as vasoconstriction and hypertension, headache and stomach ulcers, glucose metabolism disorder and resistance-to-insulin. Psychically and behaviorally, it expresses itself as tenseness, irritability, moodiness, and inability to relate pleasantly to people. Behavioral disorders further accentuate physiological disorders, in a feedback mechanism.

Psycho-Somatic Pathways: The science and mechanisms of psychosomatic disorders and psychosomatic medicine are ill understood, and they require multi-disciplinary approaches involving biopsychology and psycho-neuro-endocrine physiology. The psychosomatic pathways (based on the formulations in Indian and Chinese medicine) involve psychic

plexuses and channels, influencing neural & endocrine systems and organ systems.

Behavioral Traits Associated with Psychic Plexuses: It is deemed that specific behavioral traits are associated (rather concentrated) with specific psychic plexuses or *cakras*, which are in turn associated (on a one-to-one basis) with endocrine glands. **Table 1** provides this association between behavioral traits and *cakras*, as well as the correspondence between *cakras* and endocrine glands.

(2) Association between Behavioral Traits, corresponding Cakras, and Endocrine Glands

Table 1 provides the association between behavioral traits, corresponding *cakras*, and associated endocrine glands. These behavioral traits can be controlled by energizing the *cakras* by meditation techniques.

Table 1: Association between Behavioral Traits, *Cakras*, and Endocrine Glands

Behavioral Traits	Corresponding <i>Cakras</i>	Associated Endocrine Glands
Relaxed state of mind, feeling of inner peace	<i>Sahasrara cakra</i>	Pineal gland
Intuition	<i>Ajina cakra</i>	Pituitary gland
Attraction and repulsion, universal welfare	<i>Vishuddha cakra</i>	Thyroid gland
Hope, anxiety, love and attachment, arrogance, depressions, argumentativeness	<i>Anahata cakra</i>	Thymus gland
Shyness, fear, hatred, envy, melancholy	<i>Manipura cakra</i>	Adrenal gland
Crude manners, helplessness, lack of confidence and common sense	<i>Svadhithana cakra</i>	Sexual glands
Sexual feelings	<i>Muladhara cakra</i>	Reproductive glands (Ovaries and Testes)

(3) *Cakra* dysfunction and Behavioral Response

Energy (or *prana*) circulates from *cakras* through the *nadis* or channels (or meridians) to the body parts. Malfunctioning of *cakras* causes imbalanced energy flow, in turn causing behavioral disorders. This results in imbalanced hormonal secretion of the endocrine glands, in turn causing psychosomatic disorders and diseases.

The way in which a person will respond to circumstances and environment depends on the well- functioning or malfunctioning *cakra* system. For instance, one person may feel happy with her/his friend's success, while another feels jealous. One person can want to bring down another supposedly successful person, while another person can be indifferent. One person can feel proud of herself/himself due to her/his knowledge and/or affluence, while another could be modest about it. One person may respond by being melancholy to on-the-job persecution, while another will have a better sustaining capacity. One person may respond to stress (due to personal problems, physical illness, and persecution at work) by becoming hypertensive and getting ulcers, while another may be able to better sustain the stress.

The science of psychiatry lies in this association of behavioral traits with the malfunctioning of the corresponding *cakras*. Hence, psychotherapy involves stimulating and energizing these *cakras* through meditation techniques. This now needs to be incorporated into the treatment of

IV. Yogapathy Meditation Systems for Psychosomatic Health and Self-Realization

Here in, for a more elaborate and expansive Meditation system, we will employ and briefly explain the three lessons of *Ananda Marga* System of Meditation: (i) *Ishvara Pranidhana* meditation, involving ideation on the all-pervading divine consciousness (by means of appropriate mantras) for obtaining liberation from the embedded impressions in the mind (*samskaras*), and becoming divine; (ii) *Pranayama*, involving breathing in *pranah* (vital energy) into the body, and becoming sanctified; (iii) *Cakra Shodhana*, involving stimulating the *cakras* with divine consciousness (by means of mantras), to keep the body and mind healthy and to also cure diseases. Detail explanations of these lessons can be obtained from Reference³.

IV.1 *Ishvara Pranidhana* Meditation System: Fundamentals

The meaning of *Ishvara Pranidhana* is offering one's mental self to *Ishvara* (*Brahma*, God) or Divine Entity and making union with God. The goal of this lesson is to obtain liberation from *samskaras* or embedded psychic impressions in the subconscious mind. Herein, the aspirant is taught how to ideate on the all-pervading divine Consciousness or Divine Entity and developing union with it, as illustrated in **Figure 5**.

Meditation Process: Our meditation practice involves the process of ideating on the Divine Entity by recognizing its divine presence around us. You then withdraw yourself from being aware of the physical surroundings, and visualize being blissful in the effulgent world of divine Consciousness or Divine Entity. Next, you can withdraw the mind from the body (from bottom upwards, *cakra* by *cakra*) and arrive at the prescribed *Ista cakra*, whereby you are only aware of the presence of Divine Entity all around. You then ideate on the Divine Entity by using a prescribed 2-syllable *mantra* (which has the connotation of uniting one's unit mind with the divine consciousness of the Divine Entity). The general meaning of a mantra is "I am that Divine Entity" or "You are my Lord" (and with your guidance, I can become divine). This ideation brings in divine energy flowing into your mind, flooding it with blissful feelings and literally lighting it up (and feeling enlightened). Developing a personal relationship with the Divine Entity gives you immense happiness and security, based on the feeling of being taken care of by the Divine Entity.

Through this process over time, one's mind gets cleared from its embedded impressions (or *samskaras*) formed by one's actions and their reactions. This relieves all stress and develops happiness, by the feeling of union with the Divine Entity. In simple terms, this meditation is "taking the time off one's worldly involvements and spending time being with the Divine Entity", who is awaiting this union.

Achieving Liberation: Clearing the mind from its embedded impressions is referred to as Liberation. During this process of liberation, one's entire mental thinking gets transformed, one's personality and character get elevated, and one's interactions with others enter a new phase. Over time, this brings a feeling of oneness with the Divine Entity and of becoming divine. This is verily the purport and goal of this meditation system of mind ideating on the all-pervading Divine Entity.

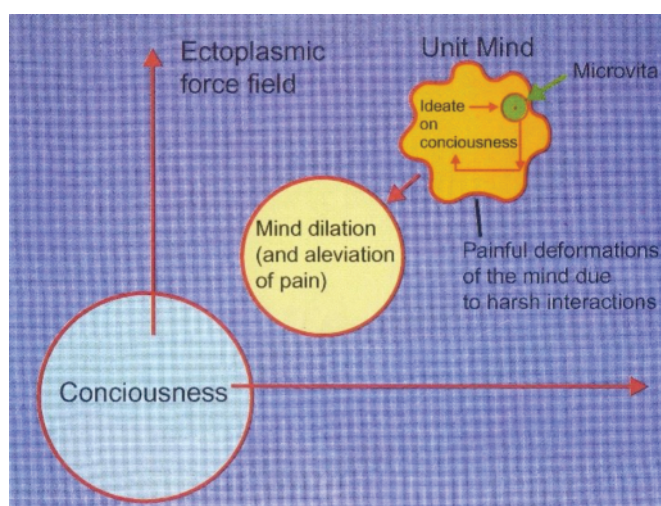


Figure 5: The Consciousness field and the presence or location of mind in it.

In normal mundane and materialistic living, the mind gets deformed as schematized in the figure. Now when a person (or her/his mind) ideates on divine Consciousness (by meditation), the mind dilates i.e., develops in ectoplasmic density (as schematized in the figure). This ideation correspondingly enhances the Consciousness-field force on it and alleviates the mental pain, by obliteration of the embedded impressions within it, caused by the reactions of our actions. With awareness of and ideation on divine Consciousness, the mind keeps dilating and literally gets lit up, giving the feeling of enlightenment. Eventually as the mind gets liberated from its *samskaras*, it can merge into Consciousness, leading to salvation or nirvana. Here one can have a choice to not merge into Consciousness, but to retain this evolved liberated mind state and serve humanity as a guru^{1,2,3}.

IV.2. *Pranayama*: Inviting in *Pranah*, Cosmic vital energy, by breathing

Concept: The Cosmic vital energy of *Brahma* (God) or Divine Entity is all around you. You need to take it within you, to keep you physically, psychically, and spiritually rejuvenated.

Psycho-philosophy: The collective name of the ten *vayus* or vital energies (*prana*, *apana*, *samana*, *udana*, *vyana*, *naga*, *kurma*, *krkara*, *devadatta* and *dhanainjaya*) is known as *pranah*, which functions as the direct cause of life and controls the activities of a living being. The controlling organ of the ten *vayus* (vital energies) is *pranendriya*. It is a “psychic organ”, which categorizes and analyzes perceptions received from the sense organs. Its position is in the *anahata cakra*. The process by which the *pranas* in the body are controlled is called *Pranayama*.

Pranandriya plays the most vital part on the physical and psycho-physical levels. Every activity of *pranendriya* is pulsative, and it is during the state of pause that the *citta* (mind consciousness) is able to take the form of incoming *tanmatras* (perception). If *pranendriya* is in a state of equipoise, it creates calmness throughout the psycho-physical structure, to assist the *citta* to perceive the *tanmatras* correctly.

This is the psycho-philosophy behind the practice of *pranayama*, entailing *pranandriya* to remain in a state of equipoise, thereby merging the unit mind into the ocean of Consciousness, to enable experience of the supramental stratum.

When we concentrate and consciously regulate our breathing, we can store up a great amount of *pranah* in the various nerve centers or *cakras*. Through *pranayama*, every part of the body becomes filled with vital energy, and all diseases can be cured from the root.

Performing *Pranayama*: The practitioners are instructed to do mind withdrawal from the surroundings and body, as explained in the *Ishvara Pranidhana* lesson. Then, as you breathe in with the first syllable of the mantra, you can visualize that the Vital energy (*pranah*) is entering into you

from the all-pervading Cosmic Entity (or *Brahma*) through a particular (prescribed) *cakra*. This Vital energy is being used to replenish yourself physically, psychically, and spiritually. Then, as you exhale with the second syllable of your *mantra*, you visualize that after the Vital energy has been thus utilized, it is now going out through the *cakra* to *Brahma*. After this, the *pranah* is replenished again during inhalation.

Proper control of breathing in *pranah* can alleviate many diseases— such as heart disease, high blood pressure, asthma, and tuberculosis, among others. Breath control dissolves emotional tensions and relaxes the mind, and increases willpower, concentration, and self-control. Primarily, when the Divine Entity's *pranah* is infused, one can get totally sanctified and one's ideas will become divine.

IV.3 *Cakra Shodhana*: Meditation of divine consciousness on the *Cakras* affecting the Body (Physiological Systems and Organs) and Human Thinking

Background: *Cakras* are sub-stations of the mind, as illustrated in Figure 1. Body and mind depend on the activeness of the *cakras*. By *Cakra Shodhana* (meaning *cakra* purification), the *cakras* get purified, and one's whole being is elevated.

Concept: The *cakras* are imbibed with our *vrittis* (embedded sentiments or propensities), which are potential seeds of *samskaras* formation. **Table 1** provides some insight into association between *cakras* and human behavioral traits. Hence, we need to 'purify our defective *cakras*' by stimulating them (at their central point) with the “sacred idea (and *bhava*)” of our *mantra*. Ideas imposed on *cakras* are propagated through the *nadis* (energy channels) to the body regions, and the body thereby gets consecrated.

In this meditation system, we invite the Divine Entity to put in divine energy into our body. Thereby, we are aware of the *cakras* and the divine light (of the Divine Entity) around them. Then we primarily concentrate on the controlling point of the *Cakra*. For example, in the case of the *manipur cakra* (triangular in shape, and red in color), we can concentrate at its centroid and then stimulate it with the divine light by means of the 'prescribed *mantra*'; this helps the digestive system, and also the pancreatic hormonal secretion gets affected. All *cakras* are thereby brought into the rhythm of the *mantra*, to create one tune of divine consciousness.

Process: As meditators, we first place our mind at the central point of *muladhara cakra* and stimulate (or energize) it with our *ista mantra* 2 to 3 times, with the feeling that in this process the divine light is purifying the *cakra* by wiping off its embedded *vrittis*. Then, we raise our mind to the *svadhisthana cakra* and likewise 'purify' it. We thus keep purifying each *cakra* up to the *sahasrar cakra*. We can now descend, purifying each *cakra* up to the *muladhara cakra*. This constitutes one trip. Like that, we can complete two to three trips.

By ideating at the controlling points of the *cakras* with the *mantra*, the meditators can attain *anandam* (spiritual bliss). They can reach a stage of divine composure, and when they will reach the *sahasrar cakra*, the divine nectar secreted from that point can make them realize complete peace pervading their mind and body.

Energizing *cakras* to regulate the organs: The *Cakras* also link the mind and body through their association with the endocrine glands. By this linkage, they also affect the organs and have a physiological curative role. Linking the mind and the physical body (or the organ systems) are these subtle psychic energy centers or *cakras* (depicted in **Figure 1** and **Table 2**), which control our mental propensities and behavioral expressions, as well as the body through the endocrine glands. The *cakras* are connected by subtle energy channels (or *nadis*), through which the vital (bioplasmic) energy (or *pranah*) is conceived to reach each and every part of the body.

The *cakras* are also associated with and control specific endocrine glands, as depicted in **Figure 1**. The *cakras* regulate organ function through these glands, by stimulating their hormonal secretions; this is how the *cakras* influence the body. So, by spiritually energizing the *chakras* with the *mantra*, the associated endocrine glands can secrete hormones into the organs. In this way, the organ systems get affected and cured of their ailments. For example, (i) energizing the *Anahata cakra* can help to take care of the heart function, and cure hypertension; (ii) energizing the *Manipur cakra* can help to keep the digestive organs functional, and cure diabetes, and (iii) energizing the *Sahasrar cakra* (and associated Pineal gland) can help to prevent and cure Alzheimer's disease and dementia.

Table 2 depicts how the *cakras* can control and regulate the organ systems

IV.4 Energizing the *Cakras* to (i) regulate Human Expression, Instincts, and Thinking, as well as (ii) protect body structures and cure diseases

What is even more important is how *Cakras* can influence (i) human expression, instincts, and thinking, and (ii) endocrine glands, to take care of body structures and organs, and cure diseases, as conveyed by **Table 2**. We are what our mind is. Our mind is how we think, express ourselves, relate to happenings around us, and how we relate to others (family, friends, and community).

Muladhara(Root) cakra is associated with survival and security. Energizing this *cakra* (with the prescribed *mantra*) can help to (i) provide survival and security, and (ii) take care of the spinal column, legs, and bones. It could even take care of leg arthritis.

Svadhithana(Sacral) cakra is associated with career and power, procreation and sexuality. Energizing this *cakra* (with the prescribed *mantra*) can take care of (i) the sexual organs, large intestine, (ii) lower vertebrae, pelvis, hip area, and (iii)

urinary bladder. It could even control prostate enlargement.

Manipur (Solar Plexus) cakra is the power center, and can promote self-confidence and esteem. Energizing this *cakra* (with the prescribed *mantra*) can stimulate the Adrenal glands, and take care of (i) the stomach, pancreas, intestines, liver, gall bladder, and (ii) middle spine. It could even prevent and control diabetes.

Anahata(Heart) cakra is the love center, and can inculcate love, compassion, and forgiveness. Energizing this *cakra* (with the prescribed *mantra*) can stimulate the Thymus gland, and take care of (i) the heart and circulatory system, breast and ribs, (ii) lungs and diaphragm, (iii) shoulder and hands. It could even control blood pressure.

Vishuddha (Throat) cakra is the expression center, and deals with communication and honesty. It is also the expression of creativity (arts and music) and will power. Energizing this *cakra* (with the prescribed *mantra*) can stimulate the Thyroid gland, and take care of (i) the throat, esophagus, and trachea, (ii) mouth, jaw, and teeth, and (iii) the vertebrae.

Ajina cakra (Third eye) is the perception center. It develops psychic consciousness, wisdom, and intuition. Energizing this *cakra* (with the prescribed *mantra*) can stimulate the Pituitary gland, and take care of the brain and sensory organs, and even promote higher thinking.








Sahasrara (Crown) cakra is the spiritual center. It can develop higher consciousness and enlightenment. Energizing this *cakra* (with the prescribed *mantra*) can stimulate the Pineal gland, and take care of the central nervous system, muscular system, and skin. The awakening of this crown *chakra* could promote universal flow of energy and spiritual enlightenment.

Through regular meditation of *Ishvara Pranidhana*, *Pranayama*, and *Cakra Shodhana*, a person can control the lower instincts, and maintain a divine state by mentally being in the *Ajina cakra* and *Sahasrara cakra*. This is the uniqueness of the *Ananda Marga* system of meditation. In fact, we are associating *Yogapathy* with this higher consciousness system of meditation, promoting cosmic thinking and developing spirituality. As more and more people learn to meditate in this way, it will help to usher a spiritual revolution, leading to the formation of a more evolved and happier world.

V. Neuroplasticity characterization of the “*Yogapathy Meditative State*” by EEG, showing its Therapeutic Value

Electrical activity from the brain is displayed in the form of brainwaves on the EEG waveform. States of rest, sleep, and mental activity have been characterized through the frequency analysis of electroencephalographic (EEG) data^{4,5}. There are four predominant categories of brainwaves based on the level of activity. Beta waves (12 to 38 Hz) are predominant during the normal waking state, when one is engaged in cognitive tasks being alert and engaged in problem - solving or decision making. Alpha brainwaves (8 to 12 Hz) are dominant when the

Table 2: Association of *Cakras* with (i) human expressions and human thinking, and (ii) physiological systems

	<p>Seventh <i>Cakra</i> - CROWN Located at the top of the head.</p> <p>Affirmation: "I Am", "I Underst and"</p>	<p>Spiritual Centre Development of Psychic Abilities, Enlightenment, Unity.</p> <p>Energizing this <i>cakra</i> can stimulate the Pineal gland, and helps Central nervous system, muscular system, and skin</p>
	<p>Sixth <i>Cakra</i> - THIRD EYE Located in the centre of the forehead</p> <p>Affirmation: "I Know", "I Think"</p>	<p>Perception Centre Psychic Consciousness; Wisdom & Intuitive Ability; Visualization; Power of Mind.</p> <p>Energizing this <i>cakra</i> can stimulate the Pituitary gland, and helps (i) the brain and neurological system, (ii) eyes, ears, nose.</p>
	<p>Fifth <i>Cakra</i> - THROAT Located in the centre of the throat</p> <p>Affirmation: "I Speak", "I Express"</p>	<p>Expression Centre Communication; Inner Voice; Speaking from Truth; Expressions of Creativity (Arts, Music); Will Power.</p> <p>Energizing this <i>cakra</i> can stimulate the Thyroid gland, and helps (i) throat, esophagus, trachea, mouth, jaw, teeth, (ii) neck and vertebrae.</p>
	<p>Fourth <i>Cakra</i> - HEART Located in the centre of the chest</p> <p>Affirmation: "I Love"</p>	<p>Love Centre Compassion; Unconditional Love; Hope; Forgiveness.</p> <p>Energizing this <i>cakra</i> can stimulate the Thymus gland, and helps the heart & circulatory system, ribs & breast, lungs & diaphragm, shoulders, arms, hands.</p>
	<p>Third <i>Cakra</i> - SOLAR PLEXUS Located in the area above the naval</p> <p>Affirmation: "I can", "I Do"</p>	<p>Power Centre Self-confidence and Esteem; Manifestation.</p> <p>Energizing this <i>cakra</i> can stimulate the Adrenal glands, and take care of (i) stomach, pancreas, upper intestines, liver, gall bladder, and (ii) middle spine.</p>
	<p>Second <i>Cakra</i> - SACRAL Located in the lower abdomen, genitals, wombs.</p> <p>Affirmation: "I Feel", "I Want"</p>	<p>Creativity and Sexuality Center. Relationship with Money, Career and Power; Procreation; Ability to Feel Joy and Pleasure.</p> <p>Balancing this <i>cakra</i> helps the sexual organs, large intestine, lower vertebrae, pelvis, hip area, and urinary bladder.</p>
	<p>First <i>Cakra</i> - ROOT Located at the base of the spine</p> <p>Affirmation: "I Do", "I Am"</p>	<p>Survival and Security Centre. Family Connections; Animal Instinct; Controls Fear; Helps in Grounding.</p> <p>Balancing and energizing this <i>cakra</i> helps the Spinal column, rectum, legs, bones, feet. It energizes the body, and increases overall health.</p>

mind is quiet, and sometimes during meditation. Theta brainwaves (3 to 8 Hz) occur mostly in sleep and in deep meditation; during this state, the senses are withdrawn from the external world and focused on the internal mind. Delta waves (0.5 to 3 Hz) are present in the deepest state of meditation and during dreamless sleep. It has been noted that a mentally-disturbed person (with a primarily beta EEG pattern) has a lesser proportion of alpha waveforms when compared to one with a calmer mental state.

Characterization of subjective states of feeling indicates that (i) the 'beta' state is associated with worry, anger, fear, and frustration. (ii) the alpha state is associated with pleasant feeling, wellbeing, tranquility, relaxation; abundance of alpha-wave activity is considered to represent a state of rest (not sleep), relaxation and relief from concentration. (iii) progressive lower frequency states (from beta to alpha and more pronounced increased alpha-activity shift to lower frequency alpha states) are associated with increased relaxation and tranquility, culminating in a deep 'internalized' state (of warmth, love, and contentment) in the theta state. (iv) the 'theta' state is characteristic of the meditative state^{6,7}.

In the *Ananda Marga* system of meditation or Intuition Practice (IP), in *Ishvara Pranidhana* (explained above) the practitioner concentrates on a particular *cakra* and mentally incantates a two-syllable mantra (which has the connotation of uniting one's unit mind with divine Consciousness), synchronous with her/his breathing. Both the *cakra* and *mantra* are specific to a subject and correspond to her/his intrinsic rhythm and psychic state. In the next section, we now present some physiological characterizations of the meditative state by using EEG.

V.1. EEG Response Characterization of the Meditative State

In our study^{8,9}, the subjects (four meditators and one non-meditator) sat quietly in an electrically shielded room. An 8-channel Grass EEG, machine was used for recording outputs from the scalp electrodes. The first six channels were used for recording bipolar signals in the order FP2-C4, C4-O2, T4-O2, F1-C3, C3-O1, and T3-O1. The seventh channel was used for recording the ECG, and the eighth for the oculogram.

For each subject, the EEG was recorded for 15 minutes with the subject in a relaxed but mentally active state, with the eyes closed. Then, the meditator was asked to 'meditate' and the non-meditator was asked to 'concentrate', and their EEG was recorded during this period, which normally lasted for 30 min. A recording of the post-meditative or post-concentration period was also taken for 15 minutes. Frequency spectral analysis of the EEG data was carried out to determine the percentage of waves corresponding to each frequency band, as histograms.

V.2. Results

In all the studied subjects, the EEG pattern showed the absence of sleep spindles that are characteristic of drowsiness. Meaning, the monitored subjects did not sleep, rather they were meditating/concentrating. This was also confirmed by the absence of Rapid Eye Movement (REM) sleep in the oculogram.

Since the occipital leads show the variations in alpha activity prominently, the frequency analysis was carried out for the C_4-O_2 leads only, for this experiment. The EEG analysis of an IP practitioner **Subject 1** (a regular practitioner of meditation) is shown in **Figure 7**. The figure shows the percentage of waves corresponding to each frequency band, as histograms. It can be seen that for Subject 1, there is a pronounced shift to a lower frequency spectrum during meditation. **Figure 8** shows the wave distribution for **Subject 2**, who is another IP practitioner and instructor. Again, there is an abundance of waves at various frequency bands, but especially there are more waves in the lower theta frequencies. **Figure 9** shows the wave distribution for **the non-meditator subject**. For this subject, the frequency spectrum in a normal state was in a higher frequency band compared to that of regular meditators. Also, when this subject 'concentrated' there was no shift in the EEG frequency distribution. The distribution is grouped around the intrinsic frequency of 10Hz.

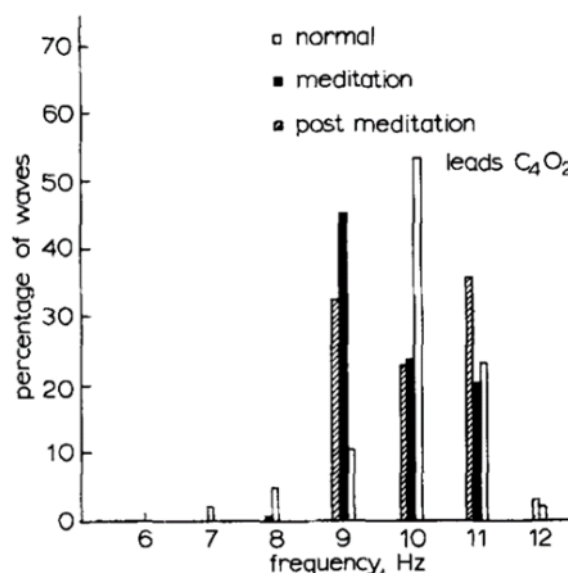


Figure 7: The relative abundance of waves at various frequency bands of Subject 1 who is a regular practitioner of IP, before, during, and after meditation. Adopted from⁹.

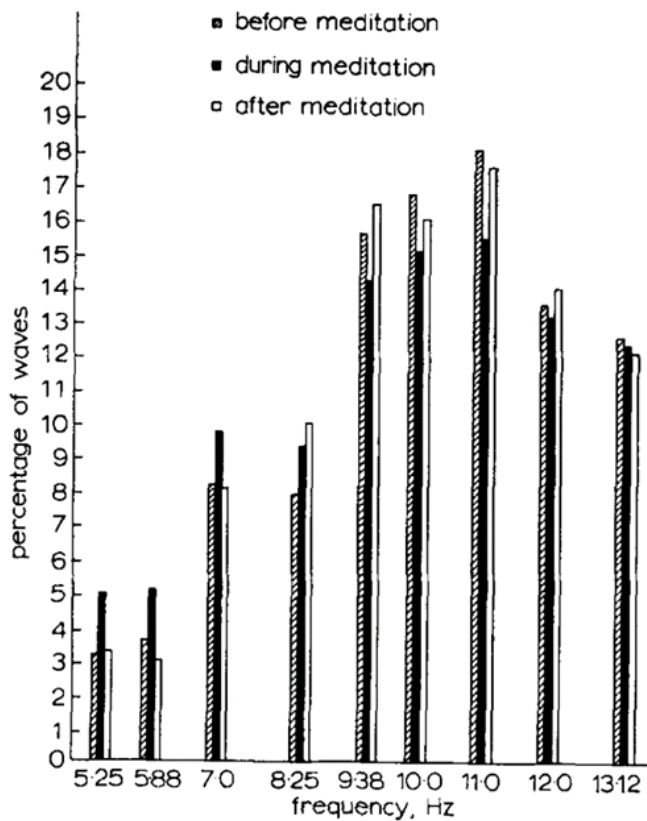


Figure 8: The relative abundance of waves at the various bands for Subject 2 before, during, and after a session of IP. The subject is an adept and an instructor of IP. Adopted from⁹

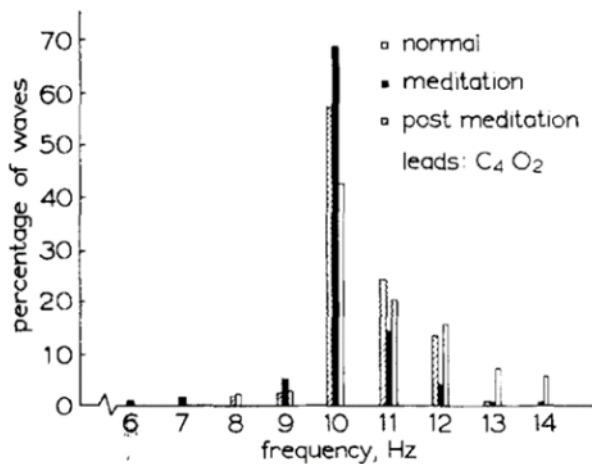


Figure 9: The relative abundance of waves before, during, and after meditation for a non-meditator. Adopted from⁹

For intuitional (IP) or practitioners of meditation, we noted that the amplitude/frequency distribution peaked at a lower frequency band during an IP session compared with the distribution before the IP session. Now a shift of the EEG energy state to a lower frequency band is associated with a decreased mental tension and increased relaxed state and tranquility^{6,7}. **For Subject 1**, a 15 ml sample of venous blood was taken before and after meditation to determine the levels of pyruvate, lactate, citrate, and glucose. It was observed that the glucose, lactate, and pyruvate levels reduced by 25% during meditation. A decrease in lactate level indicates a decrease in the metabolic rate. The transformation of the EEG state during meditation, resulting in an energy predominance in the lower frequency band, is an index of the efficacy and therapeutic value of the Intuitional Practice (IP) of meditation.

In other words, the effectiveness of meditation can be characterized in terms of the enhancement of the percentage of (i) EEG alpha waves (8–12 Hz) relative to beta waves (12.5 and 30 Hz), associated with a more relaxed mental state, and (ii) theta waves (4–8 Hz) relative to alpha and beta waves, associated with deeply relaxed mental state and higher consciousness feeling.

VI. Yogapathy Physiology and Biomechanics of *Asanas*

An *asana* is a posture that is comfortably held. *Asanas* are special exercises that have specific effects on the endocrine glands, joints, muscles, ligaments, and nerves.

Thousands of years ago sages used to observe the animals in the forest. They noticed that each animal had certain qualities and that the animals often assumed different poses. By imitating these poses, they began to notice important effects on the human body. For example, the peacock is a bird with a powerful digestive system capable of digesting even a poisonous snake. The ancient sages developed a posture for humans, imitating that of the peacock, which strengthens the human digestive system. Other postures were also developed that exercise other organs and glands.

The most important effect of *asanas* is on the endocrine glands which secrete hormones directly into the bloodstream. The endocrine glands include the pancreas, thymus, thyroid, parathyroid, adrenals, and reproductive glands (testes and ovaries). If the secretion of any gland is too much or too little, then there will be malfunctioning in the body. For example, if the thyroid gland, located in the throat, secretes too much fluid, a person will become thin. If the gland secretes too little fluid, the person will become obese. The reason is that thyroxin, the hormone secreted by this gland, regulates metabolism or the rate at which the body converts food into energy. *Asanas* can correct the malfunctioning of the thyroid and other glands by putting pressure on the gland, which in effect massages the gland and regulates the amount of blood flowing to that gland.

Asanas also help to keep the spinal cord flexible, which is important in retarding the effects of aging on the body. As

people grow older the spinal column usually becomes rigid. Proper performance of *asanas* can prevent this process.

Another important effect of *asanas* is that they help various organs of the body to function properly. For example, several *asanas* massage the stomach and intestines and the organs involved in the digestion of and elimination of wastes. Problems such as indigestion, constipation, gastric ulcer, liver malfunction, etc. can be checked and corrected by performing certain *asanas*.

VI.1 Cure Yourself with Yoga, by Acarya Hiranmayananda Avt (Vision Creative Services, New Delhi [https://www.pathofbliss.com/product/cure-yourself-with-yoga/]

This is an excellent book, containing yoga philosophy, *cakras* and *kosas*, bio-psychology, yoga physiology, and 28 *asanas*. Herein I am providing some material from the Book Introduction. As stated by the author, the ancient yogis and *munis* (saints) observed the movement of flora and fauna - the animals and environment, and experimented with human nature. By this method, they discovered the science of Yoga. Over hundreds of years and even millennia of practice, the postures and gestures evolved. Gradually this became part of the behavior in the body-mind of human beings, generation after generation. This is how thousands of yoga postures came into existence. All these movements are called the *asanas*.

Asanas help the inner organs to function properly. Most internal influences take place via the action of the endocrine glands, whose secretion of hormones has profound effects on the body-mind. By practicing Yoga one can achieve a balanced, calm, and focused mind, free from negative thoughts and emotions. The *asanas* can impact the glands by causing them to secrete positive hormones. *Asanas* also make the bones and muscles strong. They help to correct one's physical posture, to promote proper breathing and through their practice, one can know how to store energy and maximize its use. One becomes physically relaxed and healthy, mentally tranquil, and full of vigor.

As *Raja Yoga* gives stress or importance to *Manah Shuddhi* (purification of mind), *Hatha Yoga (Yoga Asana)* gives importance to *Deha Shuddhi* (the purification of the body). According to *Hatha Yoga*, one cannot accomplish *Manah Shuddhi* without *Deha Shuddhi*. Surely our body (*deha*) is the base of *sadhana* or meditation practice. If we do not make our main base strong, we cannot build up the base of our life divine. Our body is like an instrument behind which there is the *asana* (spirit or soul). The *atma* is the permanent unseen guide and invisible force, which leads this sound body towards the door of sound and sublime mind, to allow it to reach the goal of attaining Cosmic Energy or Consciousness.

If the different aspects of the human body function properly and naturally, automatically the inherent divinity will be expressed through that body. As a unified discipline, *Yoga* aims at all-round development of an integrated personality. Step by

step, it improves physical health, harmonizes thoughts and emotions, and awakens divine qualities.

Other Important Books

Natural Medicine, by Shrii Prabhat Ranjan Sarkar [https://www.pathofbliss.com/product/natural-medicine/]

Yoga Sadhana, by ShriiShriiAnandamurti [https://www.pathofbliss.com/product/yoga-sadhana/]

Yogic Treatments and Natural Remedies, by Shrii Prabhat Ranjan Sarkar, Ananda Press

[https://drive.google.com/file/d/1PKkXtXwImzB2nuYUgCTwQgCdZlDO-TTI/view?usp=share_link]

VI.2 Yoga Asanas, for maintaining healthy body function

The practice of *yoga asanas* creates balance in the body's glandular system and strengthens the immune system, to achieve physico-psychic balance. In addition to their curative effect, the regular practice of *yoga asanas* acts as a preventive measure against sickness. By strengthening the immune system and aiding in the break-down and expulsion of toxins, we can maintain good health. The below **Figures10 (a-h)** depicts some *asanas* with their benefits. For more information on *asanas*, refer Reference¹⁰.

(a) Padmas'ana:

This Lotus posture is beneficial for keeping the mind calm and composed. It helps with curing psychic imbalance and depression. It overcomes stress and controls blood pressure. This posture brings harmony between the body and mind, which can lead one to focus on divinity.



(b) Hala'sana:

This Plough pose improves the digestive system, enhances parasympathetic nervous system, strengthens the immune system, relieves back pain, overcomes menstruation problems, relieves stress and promotes calmness of mind.



(C) Dhanura'sana:

This Bow pose improves digestion and cures constipation, alleviates stress and fatigue, stimulates the reproductive organs and helps to improve menstrual disorders, tones the back and improves spinal flexibility, tones the leg and arm muscles and strengthens them.



(d) Yogamudra:

Yogamudra calms the mind and the nerves, increases blood supply to the head, stimulates the digestive system and has revitalizing effect on the liver and heart (curing high blood pressure), increases concentration and will power.



(e) Diirghapranam:

This Long Bowing Posture is beneficial for curing many women's disorders, especially in relation to menstruation problems. This posture strengthens the abdominal muscles, making the stomach nerves and veins strong. It is especially

good for relieving constipation, loosening the bloated stomach and releasing gas. In the full bowing posture, the lungs are completely emptied, and the back is extended



(f) Bhujanga'sana:

This Cobra posture cures back problems and slip disc, tones the abdominal muscles, and improves the liver as well as massages the kidneys. It benefits the whole nervous system, strengthens the sciatic nerves, and the nerves between the throat and the brain. For women, it helps to revitalize the ovaries and support the uterus, easing the birth process.



(g) Pascimotta'sana:

This Full Head to Knee posture is beneficial for stretching the spine maximally, and helps with urinary problems and bladder control. This asana works on the spleen and kidney, and is specially helpful for the sciatic nerve. It helps curing asthma and diabetes.



Figure 10: Different Asanas: (a) Padmas'ana, (b) Hala'sana, (c)Dhanura'sana, (d)Yogamudra, (e)Diirghapranam, (f) Bhujanga'sana, (g) Pascimotta'sana

VII. Effects of Meditation on the Brain, and in Enhancing Learning Ability

We will now discuss how meditation influences the brain and the reasons why meditation can help students' learning.

1. Meditation puts one in the best brainwave state for “super learning”

Meditation boosts the alpha brainwaves, the predominant state for learning, studying, memorizing, and recollecting large sums of information. You can summon this highly creative and super-enhanced learning state, with meditation.

2. Meditation makes the left and right brain hemispheres work together

It is known that one side of the brain is more mathematical and scientific (left), while the other half is more creative and intuitive (right). Most people use one-half of their brains more than the other, creating an imbalance. Scientists have found that highly successful people use both brain hemispheres in harmony. By meditation, one can achieve “whole brain synchronization” (**Figure 11**), and enhance the learning ability.

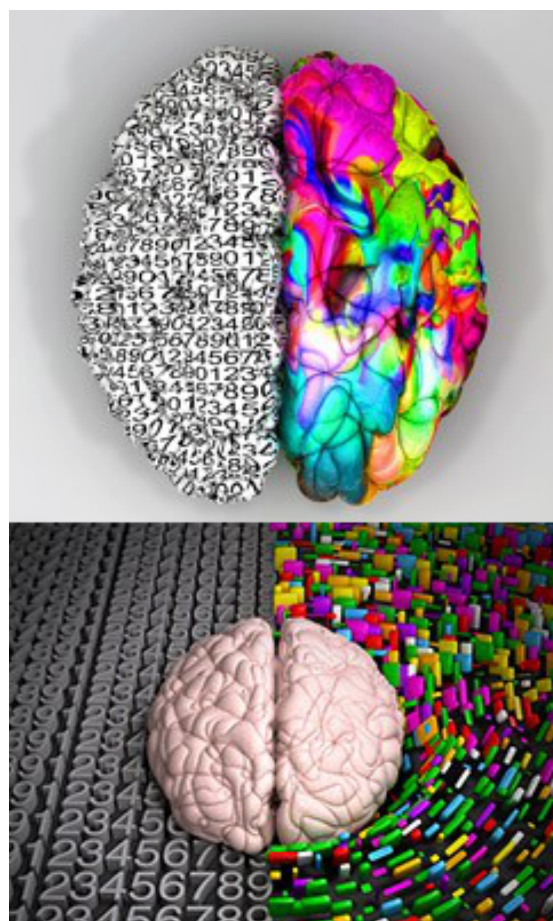


Figure 11. Meditation helps one achieve “whole brain synchronization” and enhances learning ability

3 Meditation stimulates learning-associated brain regions

The two parts of the brain that are highly active during memory storage and recall, the Hippocampus and frontal lobe, are particularly stimulated during meditation. By energizing this part of the brain, meditation multiplies the ability to memorize, store, and recollect large sums of information.

VIII. Meditation Benefits for the Body, Mind, and Spirit

Herein we are providing the benefits of mindfulness meditation for the body, mind, and spirit.

VIII.1. Effect on Body

Reduces Pain. Several studies have identified a connection between meditation and pain. One Journal of Neuroscience study, for instance, showed that after four 20-minute meditation sessions for four days, a group of volunteers rated the same burning pain as 57 percent less unpleasant and 40 percent less intense¹¹. Plus, a review of 47 studies published in JAMA Internal Medicine showed that meditation may help ease pain (although it was difficult for the researchers to identify exactly what type of pain)¹².

Boosts immune system. One 2003 study¹³. showed a link between an eight-week mindfulness meditation program and better immune function, and another research¹⁴ suggested that meditation could improve the immune system.

Lowers blood pressure. A study co-directed by Dr. Randy Zusman at Massachusetts General Hospital took patients being treated with typical high blood pressure medication, and taught them a technique called the relaxation response; more than half the patients experienced a drop in blood pressure, sometimes even resulting in reduced medication¹⁵. Even the Mayo Clinic reports that research suggests that meditation could help manage the symptoms of high blood pressure¹⁶.

Eases inflammation. In 2013, at the University of Wisconsin-Madison and the Center for Investigating Healthy Minds in the Waisman Center, scientists identified a possible link between mindfulness meditation and the relief of inflammatory symptoms among people who suffer from chronic inflammatory conditions¹⁷. Another small study suggested that mindfulness meditation may reduce loneliness and inflammatory disease risk in older adults¹⁸.

Reduces heart attack risk. A 2012 study published in the journal *Circulation: Cardiovascular Quality and Outcomes* showed a link between Transcendental Meditation and a reduction in heart attack, stroke, and early death from heart disease in a group of African Americans¹⁹. After five years of follow-up, the study concluded that meditation reduced the overall risk of heart attack by 48% in the study group. The American Heart Association also states that the stress-busting benefits of different types of meditation can be a boon to heart health²⁰.

VIII.2. Effect on Mind

Increases brain gray matter. Meditation may just be the right exercise for the brain. A 2009 study showed that MRI scans of long-time meditators revealed that their certain parts of their brains were larger than those of a control group, particularly in regions known for emotion regulation²¹. Another small study published in 2011 in the journal *Psychiatry Research: Neuroimaging* showed that an eight-week mindfulness-based stress reduction program resulted in increases in gray matter in the hippocampus and in the areas of the brain tied to compassion and self-awareness²².

Cultivates willpower. Stanford health psychologist Kelly McGonigal, Ph.D. told Stanford Medicine's SCOPE blog in 2011²³ that both physical exercise and meditation can help train the brain for willpower: Meditation training improves a wide range of willpower skills, including attention, focus, stress management, impulse control, and self-awareness. It changes both the function and structure of the brain to support self-control. For example, regular meditators have more gray matter in the prefrontal cortex. And it doesn't take a lifetime of practice – in fact, brain changes have been observed after even eight weeks of brief daily meditation training.

Builds focus and concentration. A 2010 study published in *Psychological Science* showed that Buddhist meditation improved focus and attention on a task that was designed to be both boring and demanding²⁴.

Boosts cognitive function. Another *Psychological Science* study identified a link between mindfulness training and increased standardized test scores, as well as improvements in working memory²⁵. Dr. Sara Lazar, a neuroscientist at Massachusetts General Hospital, who studies mindfulness meditation, told Huff Post that regular meditation may stave off the thinning of the brain's prefrontal cortex, which in turn helps slow down the cognitive function decline that happens later in life²⁶.

VIII.3 Effect on Spirit

Builds self-knowledge. According to a 2013 article published in *Perspectives on Psychological Science*, mindfulness (defined as "paying attention to one's current experience in a non-judgmental way") can help people to understand their own personalities²⁷.

Helps cultivate satisfactory relationships. Several studies the practice of mindfulness meditation enables practitioners to have more satisfactory relationships by improving their ability to handle relationship stress and communicate well with their partners^{28,29}.

Increases compassion. A 2013 study from researchers at Northeastern and Harvard Universities suggested that meditation may be the key to unlocking compassion. The findings, which were published in the journal *Psychological*

Science, showed that volunteers who underwent eight-week training in two types of meditation reacted more compassionately than those who hadn't meditated. Specifically, researchers set up a waiting room where an actor with crutches appeared to be in pain; while other actors ignored her, 15 percent of the non-meditators helped the person in pain, compared with 50 percent of those in the meditating group³⁰.

Enhances empathy. A small study from Emory University showed that a compassion-based meditation program, called Cognitively-Based Compassion Training (CBCT), might help people to read others' facial expressions³¹. It was suggested that CBCT may hold promise for enhancing empathic abilities, by increasing activity in parts of the brain that are of central importance for our ability to recognize the emotional states of others.

VIII.4

These immense benefits are from Mindfulness meditation, which involves awareness of one's thoughts and feelings to achieve a mental state of calm concentration and positive emotions. It is a relatively simpler meditation practice compared to our more intricate '*cakra* and *mantra*' based system of meditation' described in Section IV. So still if it has shown to have such big benefits, then our system of meditation would be able to provide even bigger benefits, which should now involve our clinical studies.

IX. Astaunga Yoga

Astaunga Yoga is the pathway of internal purification for revealing one's universal self. It consists of the following eight limbs and practices: *Yama* (moral codes to control actions related to the external world) and *Niyama* (self-regulation for self-purification), *Asana* (poses to improve posture and flexibility, health and body function), *Pranayama* (Breath Control of vital energy), *Pratyahara* (Sense control by mind withdrawal from external objects), *Dharana* (mind concentration at *Ista cakra*), *Dhyana* (meditation union of unit mind with cosmic mind), *Samadhi* (absorption into the supreme consciousness)³².

The first two practices *Yama* and *Niyama* are moral guidelines for human development. The concept of morality is that by controlling our behavior we can achieve a higher state of being, and also be helpful to the people and community. Morality is the foundation of spirituality. Morality comprises *Yama* (controlling our actions) and *Niyama* (self-regulation), which are moral guidelines for human development. Morality and spirituality are intertwined. Without morality, we cannot develop spirituality. Meditation strengthens our morality, enabling more progressive and harmonious communities and a more evolved society. In his book, *A Guide to Human Conduct*, Shrii Shrii Anandamurti has clearly explained the different aspects of *Yama* and *Niyama*³³.

In Yama, the first principle is *Ahimsa*, not to harm others in thought, words, and actions. The second principle is *Satya*, to tell the truth and act in a straightforward and honest way that will promote the welfare of all. The third principle is *Asteya*, to not take possession of things that belong to others. The fourth principle is *Brahmacarya*, to remain attached to *Brahma* or Divine Entity, and treat all beings as expression of *Brahma*. The fifth principle is *Aparigraha*, to not hoard wealth that is superfluous to our actual needs, and live a simple life with only as much physical wealth as is necessary for living needs.

In Niyama, the first principle is *Shaoca*, purity of mind and body, to observe cleanliness of one's external world such as the body, clothing, and environment, as well as the internal world of the mind by being conscious of divine presence all around us. The second principle is *Santosa*, to maintain a state of mental ease and contentment. The third principle of is *Tapah*, to undergo hardship by rendering help to people who need help so that no one is left starving and homeless. The fourth principle is *Svadhyaaya*, to have a clear understanding of spiritual subjects, and be in contact with spiritual personalities, to progress on the path of self-realization. The fifth principle part of *Niyama* is *Ishvara Pranidhana*, to make Cosmic Consciousness the goal of our life, by ideating on the Divine Entity or Cosmic Consciousness, as explained in Section IV.2.

The third practice of Astaunga Yoga is Asanas, which is described in detail Section VI.

The fourth practice of Astaunga Yoga is Pranayama or control of vital energy, which is described in detail in Section IV.3.

The fifth practice of Astaunga Yoga is known as Pratyahara, which means to withdraw the mind from its attachment to external objects. As described in Section IV.2, meditation process Step 1 consists of withdrawing the mind from the surroundings, and recognizing and manifesting the presence of the Divine Entity around us.

The sixth practice of Astaunga Yoga is Dharana. *Dharana* means the concentration of the mind at a specific point of the *Istacakra* which is one's spiritual and psychic nucleus. This process is described in detail in Section IV.2 meditation process.

The seventh practice of Astaunga Yoga is Dhyana. In this process, the mind is first brought to *Ista cakra*, and is then directed in an unbroken flow towards the Supreme Consciousness. This process is described in detail in Section IV.2 meditation process.

The last stage of Astaunga Yoga is Samadhi. It is the result of practicing the other parts of *Astaunga Yoga*, particularly *Pratyahara*, *Dharana*, and *Dhyana*. It is the stage of self-realization, and the absorption of mind in the Supreme Consciousness.

For more detail information, refer Reference³³.

X. Integrated Yogapathy and Allopathy Medical System

X.1 Benefits of Yogapathy

Based on the detail description of meditation and its benefits, it can be noted that the big benefit of Yogapathy is its promoting preventive health care to improve people's well-being, and to prevent disease and disability. Yogapathy can help to boost the immune system, maintain normal blood pressure, and increase brain gray matter.

We could even go further and based on our energizing the *sahasrar cakra* by divine energy and the prescribed mantra, we could even prevent Alzheimer's disease and dementia, characterized by changes in the brain—including amyloid plaques and neurofibrillary, or tau, tangles—that result in loss of neurons and their connections, as illustrated in **Figure 12**. These changes affect a person's ability to remember and think and, eventually, to live independently

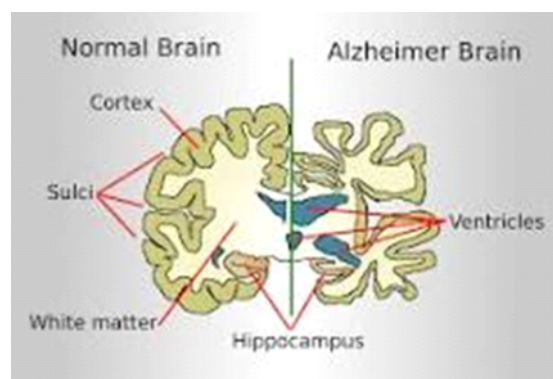


Figure 12: Normal Brain and Alzheimer Brain

There is also another aspect of Yogapathy, involving meditation ideation on the all-pervading cosmic consciousness or Divine Entity, enabling liberation of the mind from its embedded impressions, and hence promoting spirituality.

Now Yogapathy is a new medical science and system, and there is a big need to carry out extensive clinical research and publish journal papers on how it could prevent and even cure diseases, such as diabetes, hypertension, asthma, and dementia.

X.2 Benefits of Allopathic Medicine

Allopathic medicine treats disease with remedies (such as medications or surgery) that produce benefitting physiological effects from those caused by the disease. It takes on a science-based approach to treating patients and uses conventional modern medical treatments such as medication, surgery, and therapies.

For example, if due to coronary artery stenosis, there is left ventricular myocardial infarction and reduction of ejection fraction, then it could involve coronary stenting or coronary bypass surgery.

X.3 Integrated Yogapathy and Allopathy System, for a Modern Medical Curriculum

Now based on the above-described benefitting effects of Yogapathy it needs to be part of the medical system. We are hence proposing a new medical system combining Yogapathy and Allopathy. So we are now proposing the curriculum of the modern Yogapathy—Allopathy Integrated MD medical system.

We can even transform the Allopathic medicine into a STEM format of medicine, as Quantitative Anatomy and Quantitative Physiology incorporating physics and mathematics in their formats^{34,35}.

Curriculum

Foundation Summer Semester: Courses in Mathematics, Physics, Chemistry, Biology.

Years 1 and 2: based on first two years of Allopathic MBBS system, with some transformations of Quantitative Anatomy and Quantitative Physiology, as described below.

Year 1 Courses: Quantitative Anatomy, Biochemistry, Quantitative Physiology, Microbiology

Quantitative Anatomy: Anatomy can be taught quantitatively based on how anatomical structures are intrinsically designed for their function. For example: (i) the left ventricle's ellipsoidal shape and its helically wound fibers can enable it to twist and hence contract very efficiently, and (ii) the spinal vertebral body's hyperboloid shape can enable it to be force and torsion bearing, while being lightweight.

Quantitative Physiology: Physiological systems can be engineering modelled to illustrate their intricate function. For example: (i) in the left ventricle (LV), the blood flow develops vortices in response to the contractile twisting of the ellipsoidal-shaped LV, to enable efficient blood flow out of the LV into the aorta, (ii) in the kidney, the counter-current multiplier mechanism in the loop-of-Henle creates osmotic gradient for active transport of Na⁺ from the tubular fluid, and diffusion of H₂O from the tubular lumen into the interstitium, resulting in the production of concentrated urine in the distal tubule and collecting duct. Quantitative Physiology can thus pave the way to more precision medicine.

Year 2 Courses:

Community Medicine, Forensic Medicine;
Pathology, Pharmacology, Immunology;

Clinical postings in OPD wards.

Years 3 and 4: Courses based on Yogapathy

Year 3 Courses:

1. Yogapathy Root: Cosmological Cycle. Life creation and evolution to human beings.

2. Yoga Physiology: Mind and *Cakras*; *Cakras*, Endocrine glands, and Organ systems.

3. Biomechanics of Asanas: How they benefit the functioning of the human body, and the physiological systems.

4. Astaunga Yoga: *Yama* and *Niyama* (on how to live, think, and interact); *Asana* (poses to improve posture and flexibility, health and body function), *Pranayama* (breath Control of vital energy), *Pratyahara* (sense control by mind withdrawal from external objects), *Dharana* (mind concentration at *Ista cakra*), *Dhyana* (meditation union of unit mind with cosmic mind), *Samadhi* (absorption into the supreme consciousness)

5. Yogapathy Meditation Systems: (*Ishvara Pranidhana*: Meditation involving mind ideating on divine Consciousness, to promote mind liberation from its *samskaras*; (ii) *Pranayama*: breathing in *pranah* (vital energy) into the body, to replenish the *pranah* in the body by which one can get totally sanctified and one's ideas can become divine; (iii) *Cakra Shodhana*: spiritually stimulating and purifying the *cakras* by mantra of divine consciousness, thereby keeping the organs healthy and also cured of diseases (through the hormonal secretions of the associated endocrine glands).

Energizing the *Cakras* to (i) regulate Human Expression, Instincts, and Thinking, as well as (ii) protect body structures and cure diseases.

6. Meditation Benefits for the Body, Mind, and Spirit

7. Yogic Treatments and Natural Remedies to treat various diseases

[https://drive.google.com/file/d/1PKkXtXwImzB2nuYUgCTwQgCdZlDO-TTI/view?usp=share_link].

8. Yogapathy in Society: promoting Neohumanism [NEO-HUMANISM: Principles and Cardinal Values, Sentimentality to Spirituality, Human Society, by Prabhat Ranjan Sarkar].

Year 4 Courses:

Semester 1: Yogapathy Medical Applications: Meditation and Asanas for Psychosomatic health and ailments:

(i) **Meditation techniques can influence** the endocrine systems to affect both body and mind, and help cure diseases, such as arthritis, diabetes, hypertension, depression, epilepsy, Alzheimer's disease, and dementia.

(ii) **Asanas can influence** the body structures and physiological systems, and help in curing many ailments (such as constipation, stomach disorders, back pain & sciatica, asthma, insomnia) and many women's disorders (especially in relation to menstruation problems).

Semester 2: Yoga Medicine: Physiological Systems, Disorders and Treatments

Unit-1. Respiratory System: Physiology and Diagnostics, Pathology and Diseases, Pharmacological Management and Yoga Therapy [*Pranayama, Pascimotta'sana* (Full head to knee posture)].

Unit-2. Cardiovascular System: Physiology and Diagnostics, Pathology and Diseases, Pharmacological Management and Yoga Therapy [*Cakra Shodhana* meditation, *Bhujangasana* (Cobra pose), *Diirgha Pranama* (Long bowing posture), *Shavasana* (corpse posture)].

Unit-3. Nervous System: Physiology and Diagnostics, Pathology and Diseases, Pharmacological Management and Yoga Therapy [*Cakra Shodhana* meditation, *Setubandha Sarvangasana* (Inverted back-bending asana), *Bhujangasana* (Cobra posture)].

Unit-4. Endocrine System: Physiology and Diagnostics, Pathology and Diseases, Pharmacological Management and Yoga Therapy [*Cakra Shodhana* meditation, *Sasangasana* (rabbit pose), *Ustrasana* (Camel pose)].

Unit-5. Musculoskeletal System: Musculoskeletal Structures and Functions, Pathology, Pharmacological Management and Yoga Therapy for Musculoskeletal disorders [*Yoga Mudra, Shalabasana* (Locust posture), *Dhanurasana* (Bow posture)].

Unit-6. Digestive System: Physiology and Diagnostic Tests, Pathology and Disorders, Pharmacological Management and Yoga Therapy for Digestive disorders [*Ardha Pawamuktasana* (Half gas release pose), *Cakrasana* (Wheel posture), *Uttana Shishosana* (Extended puppy pose), *Bhastrika'sana* (Bellows posture)].

Unit-7. Sensory System: Physiology and Clinical Examination, Pathology and Disorders, Pharmacological Management and Yoga Therapy for Sensory disorders [*Pranayama, Cakra Shodhana* meditation, *Pascimotta'sana* (Full head to knee posture), *Baddha Konasana* (butterfly pose)]

Unit-8. Cancer and Immunology: Neoplasia and Immune System, Yoga therapy for immune enhancement [*Pranayama, Cakra Shodhana* meditation, *Bhujangasana* (cobra posture), *Padahasta'sana*].

Unit-9. Obstetrics and Gynaecology: Physiology of Pregnancy and Diagnostic Methods, Gynaecology & Pathological Conditions, Yoga therapy for menstrual and Gynaecological disorders [*Diirgha Pranam* (long bowing

posture), *Bhujangasana* (cobra posture)]

Unit-10. Psychiatry: Disorders & Diagnostics, Yoga therapy for mental health and psychiatric Disorders [*Pranayama, Cakra Shodhana* meditation, *Matsyendrasana*].

Years 5 and 6: based on final two years of Allopathic MBBS system

Community Medicine, Medicine and allied subjects: Psychiatry, Dermatology.

Obstetrics and Gynecology; Pediatrics, Geriatrics.

Surgery and Allied subjects: Anesthesiology, E.N.T., Ophthalmology; Orthopedics.

Clinical postings.

Year 7: Internships in Yogapathy and one of the other 3 Branches

Yogapathy: Teaching Patients the science and practice of Meditation and *Asanas*; monitoring patient outcomes, and preparing journal papers on both preventive and curative care.

Preventive, Primary and Specialty Care in Hospitals: Patient health management (including preventive care based on Yogapathy), Team-based care and coordination, Pharmacology and medication management, Cost-effective healthcare delivery.

Diagnostics and Therapeutics: Study and Clinical Applications of Advanced Diagnostic Technologies (based on STEM format of Medicine); Clinical rotations: radiology, imaging, pathology, pharmaceuticals.

Surgery: Science, Technology, and Patient Applications of Surgical Procedures (including patient-specific procedures, such as in coronary bypass surgery).

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