Yoga is the subject derived from ancient Indian tradition, which effected devotional wisdom, ethics and spiritual, moral, physical and psychological effect on human mind and body. Yoga is a way of life, a conscious act and not merely a set or series of learning principles. The dexterity, grace, and poise cultivated, as a matter of course, is the natural outcome of regular practice. It requires no major physical effort. In fact trying hard will turn practices into a humdrum, painful, even injurious to routine and will eventually slow down our progress. Subsequently, and interestingly, the therapeutic effect of yoga is the direct result of involving the mind totally in inspiring the body to be awakened.

The word “Yoga” derived from the Sanskrit root “Yujir Yogey” means to unite, to yoke, to join or to put together. Yoga is not about mind or body. On the other side, yoga is about developing harmony between them. In yoga practice, the mind is used to perceive (diagnose) and guide (heal) our body.

The term ‘yoga’ comes from the Sanskrit word ‘yeug’ which means to ‘join’. In its spiritual sense, it is the process by which the identity of the Jeevatma and paramatma is realized by the yogin. (practice of yoga) Swami Satyananda Sarswati (1999).

Yoga is in the spiritual sense of human being, balancing and harmonizing the body, mind and emotions. This is done through the practice of asana, Pranayama, mudra, bandha, shatkarma and meditation.
The Bhagavad Gita explains the term of yoga that work alone is the privilege and never the fruits thereof. One must work in the name of the Lord, abandoning selfish desires, not being effected by success or failure. This equipoise is called yoga (Iyengar, B.K.S. 1979 “Light of Yoga”).

**History of Yoga**

Yoga prevailed on the Indian continent over a period of 5000 years. Yoga can be traced back to the Rig Veda itself. In the mythologies (2000-1500 BCE) focus of yoga through the Vedas (Rig Veda, Sama Veda, Yajur Veda and Atharvan Vada), many famous vedic sages like Vasishtha, Yajnavalkya, and Jaigishavya described about the importance of yogic in Hinduism. The sacred scriptures of Brahmanism, known as the Vedas, contain a mixture of incantations and instructions that are written both in verse and prose. The first three books (Rig, Sama, and Yajur Veda) were used exclusively by the priest class of Brahmins. Later, a fourth book (Atharvana Vada) was developed, which provided the average person with spells and incantations they could use in everyday life.

**Upanishads (800-100 BCE)** focused more on the importance of this subject to find out ‘paramathma’ (God). Practically Rish’s philosophers and writers focused this as the right means for the unification of Athma and Paramathma.

**Maitrayaniya Upanishad (200-300 BCE)** Yoga refers to “Shadanga, the uniting discipline of the six limbs (Shad-angas), as expounded (1) Breath control (Pranayama), (2) Sensory inhibition (Pratyahara), (3) meditation
(Dhyana), (4) concentration (Dharana), (5) examination (Traka), (6) ecstasy (Samadhi).”

Katho Upanishad: yoga surfaces as “When the five instruments of knowledge stand still, together with the mind and when the intellect does not move, that is called the supreme state. The firm control of the senses is what is called yoga. One must then be vigilant, for yoga can be both beneficial and injurious”. Having received wisdom taught by the king of Death and the entire process of yoga, Nachiketa became free from impurities and death and attained Brahman. Thus it will be the identification of the inmost Self.

Bhagavad Gita (200BCE): The Bhagavad Gita ('Song of the Lord'), thought to have been composed roughly in the 2nd century BC, used the term yoga extensively in a variety of senses. Of many possible meanings given to the term in the Gita, emphasis is laid on: Karma yoga (The yoga of action), Bhakti yoga (The yoga of devotion), Jnana yoga (The yoga of knowledge).

The influential commentator Madhusudana Sarasvati divided the Gita's eighteen chapters into three sections, each consisting of six chapters. According to his method of division the first six chapters deal with Karma yoga, the next six deal with Bhakti yoga, and the last six deal with Jnana yoga. This interpretation was accepted by some later commentators and was rejected by some others.

Vamana Rishi in the Yoga Korunta, which is an ancient manuscript, “said that it contains lists of many different groupings of asanas, as well as
highly original teachings on Vinyasa, Drishti, Bandhas, Mudras and Philosophy”.

**Patanjali’s Yoga Sutras** (500 BC to 2000 BC.) assumed to have been written some 2000 years that too is drawn from mythologies. Patanjali may have lived in around 500 BC to 2000 BC and has written on mainly three subjects namely grammar, medicine and yoga. Patanjali’s three works together deal with man’s development as whole in thought, speech and action. The Patanjali Yoga sutras are 195. They are divided into four chapters or padas namely a). Samadhi pada (on contemplation) 51, b). Sadhana pada (on practice) 55, c). Vibhuti pada (on properties and powers) 55, and d). Kaivalya pada (on salvation or Moksha) 34.

In recent times his Yoga Sutras have become very popular as the yoga practice has become much more common and especially the principles of Raja Yoga. Astanga Yoga literally means the “eight limbed Yoga”, as outlined by the sage Patanjali in the Yoga Sutras. According to Patanjali, the path of internal purification for revealing the universal self consists of the following eight spiritual practices:

1. **Yamas or Bharmas**: (principles or moral code): means restraints. There are five yamas viz. Ahimsa, Satya, Astesya, Brahmacharaya and Aparigraha.

   **Ahimsa**: Ahimsa is the foundation upon which the rest or the Yamas and Niyamas are based. One must have Ahimsa in one’s thoughts, speech and actions.
Satya: Truth must always co-relate with the facts as they are. Truth that causes pain or injury is not positive. They should be spoken in harmony with nature.

Astesya: One must not take away anything from others. It would deprive others of the fruits of their work or of what is rightfully theirs. Thus stealing causes injury as well.

Brahmacharya: Control of sex organs/instincts increases one’s energy. From this energy one can gain miraculous power for self-restraint and also can gain knowledge.

Aparigraha: Non – covetousness is the lack of desire to possess not only material objects, but persons, places, feelings, etc. One who has no interest or desire to possess other’s things will find knowledge of three time states of present, past and future coming to him naturally.


Saucha: Physical and Mental cleanliness.

Santosh: Contentment with what one has.

Tapa: By fortitude the removal of impurities and mastering of the body and the senses.

Swadhyaya: Through self study communication can be established with the desired spiritual entity.
Ishwar Pranidhan: “our intelligence is no match to the divine wisdom”, keeping this in mind always, one should surrender to the will of God with total faith after having done one’s duties well.

3. Asana: Asana means posture. A stable and comfortable posture which helps attain mental equilibrium.

4. Pranayama: Pranayama means control of bio-energy. Prana is the vital energy which influences the functioning of each cell in the body. Control of Prana is control of mind. Vibrations of Prana activate the mind. With Pranayam, we understand and control our bio energy, the life giving force.

5. Pratyahara: Pratyahara means abstraction of senses. The senses follow the mind as the bees follow the queen bee. They imitate the mind. Mind is steadied with Pranayams, and with practice of Pranayams, one is also able to observe Pratyahara abstraction or withdrawal of senses from their objects.

6. Dharana: Dharana refers to concentration.

   The characteristics of Dharana are :
   a) Placing the mind on an object for a long duration.
   b) Gaining one pointed ness.
   c) Concentrating the mind on a limited area.

   Through longer periods of sustained concentration the mind undergoes a change, it relaxes, overcomes distractions and may possibly help to prevent frim mental diseases. The mind then becomes serene and joyful.

7. Dhyana: Dhyana is meditation. In Dhyana the mind does not waver from what is started in Dhyana. The central aspect in Dhyana is the mind itself – its nature, its reaction, its steadiness or lack of steadiness. When an individual is
relaxed and introspective, he understands the mind’s defects and deficiencies. In Dhyana we see a thing from many angles and see it in its wholeness. Meditation should be of a long duration and the normal should be brought under our control.

8. **Samadhi:** Samadhi is the state of trance consciousness. Bhikshu describes Samadhi as the absence of mind when concentrating on an object. In Samadhi the awareness or thinking ceases. In Samadhi – The whole effort is in realization, everything is revealed. Samadhi is an indescribable experience, if one analyses the experience while going through it, he loses it. It is an intensely positive experience. It cannot be intellectually explained.

**YOGA ASANA AND PRANAYAMA**

The basic definition of yoga Asana, derived from the Sanskrit word “to sit,” is any one of the various positions of the body performed in yogic exercise.

*Karmadhenu Tantra* discusses the Etymology of the word Asana: where ‘A’ stands for Atmasamadi, ‘sa’ for Sarvarogapratibandha and ‘na’ for Siddhiprati.

*Raghavendra Saraswati* uses the term ‘Yoga Asanas’ to refer to any positioning of the body for sitting that succeeds in providing steadiness and comfort to the practitioner.

Yoga positions are not about how far you can reach to touch your toes or how many repetitions you can perform. It is all about paying attention to how your body feels; how it moves without that excruciating pain or agony. Yoga is all about breathing correctly and about integrating that breath into your being.
Vachaspati Misra, an ancient Indian Philosopher, interprets it as the manner of sitting or the seat whereon one sits. In a nutshell, the yoga asanas can be defined as postural patterns. One has to achieve this pattern slowly, maintain it for sometime steadily and release it again in a slow and smooth manner.

Yoga enhances your strength, energy, vitality, flexibility and levels of endurance. Accordingly, your body and mind start to become more balanced until, eventually, you find it takes so much less energy to move through the day. Every one can do less and get a lot, lot more!

History of Yoga Asanas

Maharshi Patanjali, for the first time mentioned about yoga asanas. There are various references in the Vedas, Brahmanas, Aranyakas and the earlier Upanishads about these practices. Lord Shiva is often found sitting in the pose of Padmasana; thus indicating that yoga asanas were practiced in ancient India.

Characteristics of Yoga Asanas

Patanjali opines that Yoga Asana provide stability to both the body and mind. Such stability leads an individual to the sense of well-being. To achieve this one requires relaxed conditions or effortless maintenance of asana. This in turn, frees the mind and enables it to be attached with infinity or attain salvation.

Aims of Yoga Asanas

1. Yoga Asanas are psycho-physical to culture body and mind for further higher practices of yoga like pranayama, pratyahaara, dhyana, etc.
2. The asanas make body and mind healthy and these are trained in such a way that necessary equilibrium is established in overall functions.
3. Yoga Asanas are also expected to counteract the instability in the body. This instability or fickleness (tremor) is due to chronic disturbances in the muscular tone, which lead to the imbalance in the muscular activity.

4. Practicing Yoga Asanas tackle the root cause of the imbalance such as emotional conflicts, stresses, tensions, etc.

5. These also overcome the imbalance in other functions of the body such as endocrinal secretions.

Asanas have been evolved over the centuries so as to exercise every muscle, nerve and gland in the body. They secure a fine physique, which is strong and elastic without being muscle-bound and they keep the body free from disease. They reduce fatigue and soothe the nerves. However, their real importance lies in the way they train and discipline the mind.

While Swedish gymnastics and sports, which are based on external action, develop the muscles, asanas work in depth in our interior being, partly on the physical place (viscera, endocrine glands, brain, voluntary and involuntary nervous systems) and also on the mental level where they produce the sort of calm and serenity which may be the key to energy and happiness (Lysebeth, 1993).

Asanas are influencing on the endocrine glands thereby they control the hyper or hypo secretion of hormones (Lysebeth, 1993). A group of selected asanas may positively be effective in regulating the psychosomatic activity through controlling endocrine glands (Yogeshwar, 1982).
Pranayama

The word ‘pranayama’ is formed by two words i.e., ‘Prana’ and ‘Ayama’. ‘Prana’ means life force, which provides energy to different organs (including mind) and also controls many vital life processes, like respiration and circulation of blood. ‘Ayama’, on the other hand, signifies the voluntary action to control and direct this prana. Breathing is one of the vital activities governed by prana. This is the only pranic activity, which, the human beings can voluntarily regulate. Secondly, the breathing system is linked with the nervous system (base of the mental activity) on one hand and the mind (consciousness) on the other. Yoga has taken best advantage of this situation, considering that the mind could be controlled effectively with the voluntary regulation over breathing.

According to Patanjali, a slightest change brought in the normal speed of breathing is pranayama. Also systematically controlled and prolonged inhalation and exhalations constitute pranayama. Obviously to do this a voluntary control is necessary. In normal breathing also, there is a pause between inhalation and exhalation that may be only for a few milliseconds. Therefore, voluntary control brought on any one of the three, i.e., inhalation, exhalation, the pause, or on all three, is called pranayama.

There are four aspects in Pranayama:

a) Pooraka or inhalation
b) Rechaka or exhalation
c) Antar kumbhaka or internal breathing
d) Bahir kumbhaka or external breath retention.
The different practices of pranayama involve various techniques which utilize these four aspects of breathing. There is another mode of Pranayama which is called kevala kumbhaka or spontaneous breath retention. This is an advanced stage of Pranayama which occurs during high states of meditation. During this state, the lungs stop their activity and the respiration ceases. At this time, the veil which prevents one from seeing the subtle aspect of existence is lifted and a higher vision of reality is attained.

The most important part of Pranayama is actually kumbhaka or breath retention. However, in order to perform kumbhaka successfully, there must be a gradual development of control over the function of respiration. These practices influence the flow of prana in the nadis (vessels) purifying, regulating and activating them, thereby inducing physical and mental stability.

**Types of Pranayama**

Five types of prana are responsible for various pranic activities in the body, they are Prana, Apana, Vyan, Udana & Samana. Out of these Prana and Apana are most important. Prana is upward flowing and Apana is downward flowing. Practice of Pranayama achieves the balance in the activities of these pranas, which results in healthy body and mind.

- Quiet Breathing, Deep Breathing, Fast Breathing.
- Tribandha and Pranayama
- Nadi Shuddhi Pranayama or Anuloma - Viloma, Alternate nostril breathing - I
- Anuloma - Viloma or Alternate Nostril Breathing - II
- Suryan Bhedan Pranayama (Right Nostril Breathing)
- Ujjayi Pranayama
• Bhramari Pranayama
• Pranayama from Hatha Yoga (Surya Bhedan, Bhasrika, Ujjayi, Shitali, Sitkari, Bhramari, Murchha & Plavini Pranayama).

**General notes for the practitioner**

**Breathing**

Always breaths through the nose, unless specific instructions are given to the contrary, coordinate the breath with the asana practice.

**Awareness**

First we should have the knowledge of yogasana influence, integrate and harmonies all the levels of being, physical, pranic, mental, emotional, psychic and spiritual. Implicit in the concept of awareness is the idea of acceptance of any thought which comes uninvited to the mind, ‘good’ and ‘bad’ thoughts should be accepted equally, without judgment.

**Relaxation**

Before doing asanas and after doing asanas relaxation is needed from physical and mental tired.

**Time of Practice**

Asana may be practiced at any time of day except after meals. The best time, however, is the two hours before known as sunrise “Brahmamuhurta” in Sanskrit. During this period all parts of the body are fresh and ready to do asanas.
Place of practice

Silent atmosphere, well-ventilated room, or pleasant surrounding outdoors with garden. Do not practice under an electric fan unless it is extremely hot.

Blanket and Cloths

Use a folded blanket of natural material for the practices as this will act as an insulator between the body and the earth. During practice it is better to wear loose and comfortable clothing.

Bathing

Before starting have a cold shower bath and it will greatly improve the effect of the asanas.

Empty stomach

The stomach should be empty while doing asana. One reason why early morning practice is recommended is that the stomach is sure to be empty.

Diet

There are no special dietary rules for asana practitioners. According to practitioners body condition and composition better to have a natural diet like vegetarian. Specific dietary restrictions are recommended for certain health problems. Quantity diet is, and not advisable, Quality diet is advised to half-fill the stomach. Half fill the stomach with food, one quarter with water and leave the remaining quarter empty. Eat only to satisfy hunger and not so much that a feeling of heaviness or laziness occurs. ‘Eat to live rather than live to eat’ should be the way of life.
No straining

Never exert undue force while doing asana. Beginners may find their muscles stiff at first, but after several weeks of regular practice they will be surprised to find that their muscles are supple.

Age Limitation

Asanas may be practised by people of all age groups, male and female.

Termination of asana

If there is excessive pain in any part of the body, the asana should be terminated immediately and, if necessary, medical advice is sought. Do not stay in an asana if discomfort is felt.

Inverted asana

Do not practice any inverted asanas, if there is gas or fermentation in the intestines, if the blood is excessively impure, during menstruation or in later stages of pregnancy. This is important to ensure that toxins do not go to the brain and cause damage, and, in the case of menstruation, that blood does not enter the fallopian dubs.

Yoga Benefits

The most important benefit of yoga is physical and mental therapy. Yoga can significantly reduce the catabolic process of cell deterioration. Regular practice of asanas, pranayama and meditation can help such diverse ailments such as diabetes, blood pressure, digestive disorders, arthritis, arteriosclerosis, chronic fatigue, asthma, varicose veins and heart conditions. Laboratory tests have proved the yogi’s increased abilities of consciously controlling autonomic
or involuntary functions, such as temperature, heartbeat and blood pressure. Research into the effects of yogic practices on HIV is currently underway with promising results.

According to medical scientists, yoga therapy is successful because of the balance created in the nervous and endocrine systems which directly influences all the other systems and organs of the body. Yoga acts both as a curative and preventive therapy. The very essence of yoga lies in attaining mental peace, improved concentration powers, a relaxed state of living and a harmony in relationships.

Through the practice of yoga, men become aware of the interconnection or interlink among our emotional, mental and physical levels. Gradually this awareness leads to an understanding of the more subtle areas of existence. The ultimate goal of yoga is to make it possible for you to be able to fuse together the gross material (annamaya), physical (pranamaya), mental (manomaya), intellectual (vijnanamaya) and spiritual (anandamaya) levels within your being.

**Physiological Benefits**

Physicians and scientists are discovering more and more new health benefits of yoga everyday. Studies show that it can relieve the symptoms of several common and potentially life-threatening illnesses such as asthma, respiratory problems high blood pressure, pain management, back pain, arthritis, and weight reduction.
Asthma

The recent research was conducted at yoga institutions in India have reported impressive success in curing asthma. It has also been proved that asthma attacks can usually be prevented by yoga methods without resorting to drugs.

Physicians have found that the addition of improved concentration abilities and yogic meditation together with the practice of simple postures and pranayama makes treatment more effective. Yoga practice also results in greater reduction in anxiety scores than drug therapy. Doctors believe that yoga practice helps patients by enabling them to gain access to their own internal experience and increased self-awareness.

Respiration Problems

Patients who practice yoga have a better chance of gaining the ability to control their breathing problems. With the help of yogic breathing exercises, it is possible to control an attack of severe shortness of breath without having to seek medical help. Various studies have confirmed the beneficial effects of yoga for patients with respiratory problems.

High Blood Pressure

The relaxation and exercise components of yoga have a major role to play in the treatment and prevention of high blood pressure (hypertension). A combination of biofeedback and yogic breathing and relaxation techniques has been found to lower blood pressure and reduce the need for high blood pressure medication in people suffering from it.
Pain Management

Yoga is believed to reduce pain by helping the brain’s pain center regulate the gate-controlling mechanism located in the spinal cord and the secretion of natural painkillers in the body. Breathing exercises used in yoga can also reduce pain. Because muscles tend to relax when you exhale, lengthening the time of exhalation can help produce relaxation and reduce tension. Awareness of breathing helps to achieve calmer, slower respiration and aid in relaxation and pain management.

Yoga’s inclusion of relaxation techniques and meditation can also help reduce pain. Part of the effectiveness of yoga in reducing pain is due to its focus on self-awareness. This self-awareness can have a protective effect and allow for early preventive action.

Back Pain

Back pain is the most common reason to seek medical attention. Yoga has consistently been used to cure and prevent back pain by enhancing strength and flexibility. Both acute and long-term stress can lead to muscle tension and exorbitant back problems.

Arthritis

Yoga’s gentle exercises designed to provide relief to needed joints had been Yoga’s slow-motion movements and gentle pressures reach deep into troubled joints. In addition, the easy stretches in conjunction with deep breathing exercises relieve the tension that binds up the muscles and further tightens the joints. Yoga is exercise and relaxation rolled into one - the perfect anti-arthritis formula.
Weight Reduction

Regular yoga practice can help in weight management. Firstly, some of the asanas stimulate sluggish glands to increase their hormonal secretions. The thyroid gland, especially, has a big effect on our weight because it affects body’s metabolism. There are several asanas, such as the shoulder stand and the fish posture, which are specific for the thyroid gland. Fat metabolism is also increased, so fat is converted to muscle and energy. This means that, as well as losing fat, one will have better muscle tone and a higher vitality levels.

Psychological Benefits

Regular yoga practice creates mental clarity and calmness, increases body awareness, relieves chronic stress patterns, relaxes the mind, centers attention and sharpens concentration.

Yogic practices that reduce anxiety tend to reduce anxious eating. In addition, during yoga deep breathing increases the oxygen intake to the body cells, including the fat cells. This causes increased oxidation or burning up of fat cells. Yogic exercises induce more continuous and deeper breathing which gradually burns, sometimes forcefully, many of the calories already ingested.

Self-Awareness

Yoga strives to increase self-awareness on both physical and psychological levels. Who practice yoga learn to induce relaxation and then to use the technique whenever pain appears. Practicing yoga can provide chronic pain sufferers with useful tools to actively cope with their pain and help counter feelings of helplessness and depression.
Mental Performance

A common technique used in yoga is breathing through one nostril at a time. Electroencephalogram (EEG) studies of the electrical impulses of the brain have shown that breathing through one nostril results in increased activity on the opposite side of the brain. Some experts suggest that the regular practice of breathing through one nostril may help improve communication between the right and left side of the brain. Studies have also shown that this increased brain activity is associated with better performance and doctors even suggest that yoga can enhance cognitive performance.

Mood Change and Vitality

Mental health and physical energy are difficult to quantify, but virtually everyone who participates in yoga over a period of time reports a positive effect on outlook and energy levels. Yogic stretching and breathing exercises have been seen to result in an invigorating effect on both mental and physical energy and improve mood.

Spiritual Benefits

When you achieve the yogic spirit, you can begin knowing yourself at peace. The value of discovering one’s self and of enjoying one’s self as is, begins a journey into being rather than doing. Life can then be lived practicing "yoga off the mat".

Pride

Pride, and especially anxiety about pride, is something which Hatha Yoga seeks to diminish or eliminate. To one who has been dejected because he cannot do his work properly when he becomes tired, irritable, or haggard, any degree of
refreshment may be accompanied by additional degrees of self-respect. Furthermore, one who has benefited from yoga may be moved to help his friends who are obviously in need, he may instruct others and be rewarded with appreciation due a to teacher. But, if one succeeds in achieving skill which provides health and self-confidence, one may justly raise his self-esteem simply by observing himself living the improved results as an achieved fact.

Knowledge

Yogic theory and practice lead to increased self-knowledge. This knowledge is not merely that of the practical kind relating to techniques, but especially of a spiritual sort pertaining to grasping something about the nature of the self at rest.

Knowing the self at rest, at peace, as a being rather than merely as an agent or doer, is a genuine kind of knowledge which usually gets lost in the rush of activities and push of desires. The value of discovering one’s self and of enjoying one’s self as it is, rather than as it is going to be, is indeed a value as well as a kind of knowledge.
The marvelous findings in yoga and its integration development in human body of psychology, biology, physiology and spiritual characters. The correlation functions among the psychology, biology and physiology are appeared clearly in yoga.

Through the yoga, meditation and pranayama, the psychological benefits are more effective and influence on psychomotor function. The bio-chemical reaction depends on endocrine function. The endocrine function depends on natural atmosphere, physiological function and psychological aspects. Psychology is an applied discipline that involves the scientific study of human or
animal mental functions and behaviors. Mental functions in individual and social behavior, while also exploring underlying physiological and neurological processes.

Psychological topics as perception, cognition, attention, emotion, motivation personality, behaviors are related with social behavior. Which are exposed in the men at different level of situations. During the competition, brain was involved in stress, emotion, cognition, fresh station. Due that reason, blood pressure was increased; endocrine function was made balance of secretion and nervous system also fall in disturbance.

Biology is a natural science of botany & zoology. In zoology described anatomical study of living organisms including their origin, structure, growth, function, evolution, distribution and taxonomy of human body. The correlations of different organisms in the body functioned in homeostasis. Example body temperature, water balance, blood pressure, blood glucose concentration, controlling the bio-chemical reaction in the target cells and balancing of the endocrine secretion.

Endocrine system was regulating the bio-chemical balance and homeostasis through the blood stream. Through the bio-chemical reaction in the target cells in muscular system, physiological action was take part in the organism. With the amount of quality and quantity of biological posture, physiological works are depended on it. So physiologies of human body are depended on the biological status. Biological status is depended on psychological factors. Physiological activities are also depended with psychological characteristics. These are the internal correlation for well being.
According to Pathanjali yoga suthras, human body can get good results through the yoga regular practice. Successful efforts to improve levels of physical activity in the population are contingent upon an accurate understanding of the determinants of habitual activity. While most research has focused on psychosocial and environmental influences, the potential effect of intrinsic biological control on regular activity has received little attention. This review examines evidence for the existence of such central control, offers a rationale for its function, and suggests implications for preventive health strategies resulting from a biological contribution to habitual activity levels (Philip Stevens).

RELATIONSHIP OF CHAKRAS AND THE ENDOCRINE SYSTEM

In the posture of padmasana in yoga has given important privilege to concentration on chakras, which are presented in the axially part of the body. While in the meditation along with breathing, mind should be concentration on the efforts of chakras. Maximum chakras are located in nearest endocrine gland. Which are also located in the vertebral column. There was close relationship with the associated endocrine gland. (Roberto A. Bonomi 2010).

Chakras are astral centers in the form of a lotus that store pranic energy. As nerve plexus centers are composed of interconnecting spinal nerves, the chakras are located at the convergence of the nadis (veins), the pranic currents. The endocrine system is made up of the endocrine glands that secrete hormones. Although there are eight major endocrine glands scattered throughout the body, they are still considered to be one system because they have similar functions, similar mechanisms of influence, and many important interrelationships.
Some glands have duct (or) tubes, as exocrine glands that carry their secretions. The Some glands are duct less glands in endocrine system is the body's network of glands that produce more than fifty different known hormones or chemical messengers to maintain and regulate basic bodily functions. The endocrine glands secrete hormones that enter the blood or lymph systems to regulate activity in other parts of the body to maintain physiological activities including growth, reproduction, immunity and homeostasis in vertebrates; molting and maintenance of the larval state in insects; and growth, bud dormancy, and leaf shedding in plants. Most vertebrate hormones originate in specialized tissues and are carried to their targets through the circulation. Among the many mammalian hormones are ACTH, sex hormones, thyroxine, insulin, and epinephrine. Insect hormones include ecdysone, thoracotropic hormone, and juvenile hormone. Plant hormones include ethylene, abscisin, auxins, gibberellins, and cytokinins.
The emotions and the glands of the endocrine system affect one another. (For example adrenaline from the adrenal medulla fine tunes the senses, while an over-stimulation causes edginess and eventual exhaustion.) Yoga therapy uses asanas to restore endocrine function to a balanced state.

**Sahasra chakra – Pituitary gland:**

The hypothalamus is not a gland, but a small region of the brain containing many control centers for body functions and emotions. It composed of gray matter and weighs only about 1/300 of the total mass of the brain. The hypothalamus is often considered a part of the endocrine system for a number of reasons. It sends signals to the adrenal glands to release the hormones epinephrine and norepinephrine. It also produces its own hormones. Both ADH and oxytocin are stored in the posterior pituitary gland until the hypothalamus sends nerve signals to the pituitary to release Antidiuretic hormone (ADH), oxytocin, and regulatory hormones. The pituitary gland is a small, located at the base of the brain behind the nose, and oval gland approximately the size of a grape. The pituitary glands secrete eight important hormones. As such they are associated with the Sahasra chakra, the thousand-petal lotus chakra, and the
gateway to spiritual understanding. The sahasra chakra is located at the top of the head and relates to thought, understanding and spiritual connection. Imbalances in the sahasra manifest as neurological disorders, depression, apathy, alienation, confusion or being overly intellectual. The pituitary structure lies in a small bony cavity at the base of the brain. The structure is actually composed of two separate units that serve as distinct glands.


Growth hormone functions throughout the body's life. During the growing phase, it promotes development and enlargement of all body tissues. After adolescence, growth hormone increases the rate of protein synthesis in all body
cells, decreases the rate of carbohydrate utilization, and increases the mobilization of fats and the utilization of fats for energy.

The anterior pituitary gland completely controls the thyroid through thyroid stimulating hormone. Without this hormone the thyroid, associated with the visshudha chakra, becomes so incapacitated that it secretes almost no hormone.

In a similar manner, the anterior pituitary gland controls the function of the adrenal glands, located on the kidneys and associated with the muladhara chakra. The anterior pituitary gland secretes adrenocorticotropic hormone to control the secretion of adrenocortical hormones associated with the manipura chakra. Because the pituitary's secretions control and regulate the secretions of other endocrine glands, it is often called the "master gland" of the endocrine system.

Prolactin is secreted during pregnancy and throughout lactation. On secretion the prolactin level returns to the non-pregnant level. While a mother nurses her baby, the prolactin level rises to a series of peaks. At the onset of nursing, the level reaches ten times that amount to stimulate milk production for the next feeding. If prolactin is not secreted due to hypothalamic or pituitary malfunction, the ability to produce milk is lost in a few days.

The anterior pituitary gland also produces two gonadotrophic hormones, with roles in ovarian and testicular function, associated with the svadhisthana chakra. In the female, once follicle-stimulating hormone (FSH) is secreted upon puberty the ovarian follicles mature and release ova. FSH along with luteinizing
hormone causes the ovaries to release estrogen. It is the interplay between the levels of these three hormones and progestin with their built-in feedback mechanisms that regulate the reproductive cycle in the female.

In the male, FSH promotes sperm development and luteinizing hormone stimulates the testes to secrete testosterone.

The second section of the gland is called the posterior pituitary gland. This structure only stores--rather than secretes-- the hormones antidiuretic hormone and oxytocin, which are secreted by the hypothalamus. Antidiuretic hormone allows the kidneys to recoup water that would otherwise be lost in the urine. Oxytocin stimulates muscle contraction in the uterus and the breasts for giving birth and lactating.

**Ajna chakra – pineal gland**

Descending the sushumna nadi, the next chakra is the ajna, located at the forehead or "third eye." This center of mental activity controls perception and intuition. As such, an imbalance in this chakra alters mental perception, evidenced by headaches, nightmares, or hallucinations. The ajna is associated with the pineal gland. pineal comes from Latin word “pinea” meaning “pine cone”. Its function is not fully understood scientifically. It is believed, however, to have widespread influences. The secretion of one of its hormones, melatonin, is based on the number of hours of darkness. Light striking the eyes inhibits melatonin production. This control mechanism is used in seasonally breeding species to initiate the mating season. In humans, melatonin may have a role in initiating puberty. The pineal gland may initiate responses such as temperature regulation and immune response according to time of year. This theory would
support the use of postures emphasizing ajna such as spinal twist and yoga mudra with forehead on the floor as a treatment for seasonal affective disorder.

**Visshudha chakra – Thyroid gland**

The visshudha chakra is located in the throat and is intimately associated with the thyroid gland. It is divided into two lobes Thyroid and Parathyroid. Thyroid contains a large number of blood vessels, it is composed of hollow and deep red in color. It deals with speaking and communication and is associated with the throat, arms, mouth, ears, hands and skin. Imbalances manifest as thyroid disorder, sore throat, neck ache, poor communication and holding back truth.

The thyroid gland is shaped like a bow tie and is located on the trachea beneath the larynx. Hormones of the thyroid gland THS (Thyroid Stimulated Hormone) stimulates the following hormones triodothyronin (T3) and Tyroxin (T4), which regulates the rate of metabolism in children’s affective growth and has a heat producing effect. Parathyroid stimulate PTH, which the level of calcium in the blood. It also increases the effects of epinephrine and norepinephrine (see muladhar chakra, below) and increases the rate and force of heart contraction. Finally, thyroid hormone affects growth, development and regulation of the central nervous system, by regulating the secretion of growth hormone and promoting its effects. Asanas that balance the visshudha chakra include bridge, wheel, inclined plane and half shoulder stand.

**Anatha chakra – Thymus gland**

Anatha chakra is placed of heart and it is associated thymus gland. The thymus is a soft, flattened, pinkish-gray mass of lymphoid tissue located in the
upper chest under the breastbone. The thymus secretes several hormones that are known collectively as thymosins. Thymosins help change a certain group of white blood cells called lymphocytes into T cells, which are programmed to attack any foreign substance in the blood. The thymus gland helps form specific types of immune cells and helps control the entire immune process. Thymus secretion decreases after about thirty to forty years of age, and a link has been suggested between this decreased and increased susceptibility to viral infections and cancer as one ages.

**Manipura chakra – Adrenal and Pancreas glands**

The manipura chakra represents power of solar, it is associated with adrenal and pancreas glands. Blockages in the manipura chakra manifest as ulcers, diabetes, hypoglycemia, timidity, domination and digestive problems.
The pancreas has specialized cells that differ from the majority of its cells, which secrete digestive juices that are delivered through ducts to the digestive tract. These groups of specialized cells are called islets of Langerhans and the hormones they secrete are carried in the blood vessels. The two hormones produced, insulin and glucagon, are the primary regulators of fuel metabolism. Insulin is secreted upon an increase in blood glucose levels. It lowers blood glucose levels and promotes the storage of fats. Glucagon mainly serves the opposite effect, increasing blood sugar levels and promoting the breakdown of fats.

Also associated with the manipura chakra are the hormones secreted by the adrenal cortex. The adrenal glands, located on the kidneys, actually comprise two distinct structures, one surrounding the other. The adrenal cortex is the outer layer and secretes several steroid hormones. They fall into several categories affecting carbohydrate, fat, and protein metabolism; regulating kidney secretion of sodium and potassium and androgen sex hormones.

Asanas that pertain to the manipura chakra include the navasana, shalabhasana, and dhanurasana.

**Svadhisthana Chakra – Ovary & Testes**

Located in the lower abdomen and meaning "sweetness," the svadhisthana chakra is associated with the ovaries in the female and testes in the male. It regulates the sexuality, emotions, desire and passion. In a balanced state it produces fluidity, pleasure and relaxation; imbalances manifest as isolation, emotional instability and bladder problems.
The male sex hormone is testosterone and is responsible for the development of the male physical characteristics. It also has roles in the generation of sperm and promotes male hair growth patterns; it causes the pitch of the voice to deepen, and the body to become larger and more muscular.

The two ovarian hormones are estrogen and progesterone. They are responsible for the female sexual characteristics and the female monthly fertility cycle. Estrogen causes the main physical differences distinguishing the female from the male by causing the proliferation of cells in the corresponding regions of the body. In contrast, progesterone promotes fertility by causing the lining of the uterus to thicken; and it causes the breasts to enlarge and to be able to secrete milk. It also inhibits uterine contractions from expelling the new life. The conditions associated with the svadhisthana chakra are kept in balance with the practice of bidalasana, bhujangasana, navasana, and ekapada rajakapotasana.

**Muladhra Chakra**

At the base of the spine is the muladhara chakra, the root, dealing with survival, security and safety. The endocrine function associated here is the secretion of the adrenal medulla, the center of the adrenal glands. Balance of this chakra is manifest as stability, grounding, prosperity and right livelihood.

The secretary cells adrenal medulla are modified sympathetic nerve cells whose secretions, epinephrine and norepinephrine, reach cells with no direct sympathetic nerve contact. These hormones support "fight or flight" response by causing an increase in metabolic rate, blood pressure and glucose levels, and enhanced mental activity. Balance of the muladhara chakra is maintained with the standing asanas, bhekasana, paschimottanasana and janu shirshasana. Jean
Hormone

Hormone is one of the chemical messengers produced by endocrine glands, whose secretions are liberated directly into the bloodstream and transported to a distant part or parts of the body, where they exert a specific for the benefit of the body as a whole. The endocrine glands involved in the maintenance of normal body conditions are pituitary, thyroid, parathyroid, adrenal, pancreas, ovary, and testis. Hormones regulate many of the body’s functions, including growth and development, metabolism, electrolyte balances, and reproduction. Numerous glands throughout the body produce hormones.

Functions of the Hormones:

(1) Hormones concerned with the digestive processes.
(2) Hormones concerned with regulation of extra cellular ions and water.
(3) Hormones acting on intermediary metabolism.
(4) Hormones acting like the autonomic nervous system.
(5) Hormones controlling other endocrine glands.
(6) Sex hormones.

Types of Hormones

There are two main classes of hormones. Which are steriods & non-steroid.
1. **Steroids:**

Steroids are lipids derived from cholesterol. Testosterone is the male sex hormone. Estradiol, similar in structure to testosterone, is responsible for many female sex characteristics. Steroid hormones are secreted by the gonads, adrenal cortex, and placenta (when pregnant).

Steroid hormones are derived from cholesterol by a biochemical reaction series. Defects along this series often lead to hormonal imbalances with serious consequences. Once synthesized, steroid hormones pass into the bloodstream, they are not stored by cells, and the rate of synthesis controls them. It was slow acting, long lasting, and usually end in ‘one’ e.g. Testosterone and progesterone.

The second mechanism involves steroid hormones, which pass through the plasma membrane and act in a two step process. Steroid hormones bind, once inside the cell, to the nuclear membrane receptors, producing an activated hormone-receptor complex. The activated hormone-receptor complex binds to DNA and activates specific genes, increasing production of proteins.
2. **Nonsteroid Hormones**

Nonsteroid hormones (water soluble) do not enter the cell but bind to plasma membrane receptors, generating a chemical signal (second messenger) inside the target cell. Five different second messenger chemicals, including cyclic AMP have been identified. Second messengers activate other intracellular chemicals to produce the target cell response.

According their characteristic non steroid hormones are divided into Amines [epinephrine and norepinephrine], Peptides [oxytocin, ADH] (antidiuretic hormone), Proteins [growth hormone, insulin] and Glycoproteins [FSH, TSH] are belongs to nonsteroid hormones.

**Peptides and Amines**

Peptides are short chains of amino acids; most hormones are peptides. They are secreted by the pituitary, parathyroid, heart, stomach, liver, and kidneys. Amines are derived from the amino acid tyrosine and are secreted from the thyroid and the adrenal medulla. Solubility of the various hormone classes varies Synthesis, Storage, and Secretion. It was made of proteins, fast acting and short-lived e.g. insulin and ADH.
Peptide hormones are synthesized as precursor molecules and processed by the endoplasmic reticulum and Golgi where they are stored in secretary granules. When needed, the granules are dumped into the bloodstream. Different hormones can often be made from the same precursor molecule by cleaving it with a different enzyme.

Amine hormones (notably epinephrine) are stored as granules in the cytoplasm until needed.

Exocrine glands (not part of the endocrine system) secrete products that are passed outside the body. Sweat glands, salivary glands, and digestive glands are examples of exocrine glands.

**Mechanisms of Hormone Action**

The endocrine system acts by releasing hormones that in turn trigger actions in specific target cells. Receptors on target cell membranes bind only to one type of hormone. More than fifty human hormones have been identified, act by binding to receptor molecules. The binding hormone changes the shape of the receptor causing the response to the hormone. There are two mechanisms of hormone action on all target cells.
Hormones affect target cells by two main signaling mechanisms.

Several classes of hormones exist in the body, including steroids, amino acid derivatives, and polypeptides and proteins. Those hormone classes differ in their general molecular structures in size and chemical properties. As a result of the structural differences, their mechanisms of action as to how they can enter their target cells and how they modulate the activity of those cells also differ. Steroids: which are produced by the gonads and part of the adrenal gland (i.e., the adrenal cortex), have a molecular structure similar to that of cholesterol. The molecules can enter their target cells and interact with receptors in the fluid that fills the cell (i.e., the cytoplasm) or in the cell nucleus. The hormone receptor complexes then bind to certain regions of the cell’s genetic material (i.e., the DNA), thereby regulating the activity of specific hormone-responsive genes. Amino acid derivatives are modified versions of some of the building blocks of proteins. The thyroid gland and another region of the adrenal glands (i.e., the adrenal medulla) produce this type of hormone (i.e., the amino acid derivatives). Like steroids, amino acid derivatives can enter the target cell.
Physiology of hormones

Most cells are capable of producing one or more molecules, which act as signaling molecules to other cells, altering their growth, function, or metabolism. The classical hormones produced by cells in the endocrine glands mentioned so far in this article are cellular products, specialized to serve as regulators at the overall organism level. However they may also exert their effects solely within the tissue in which they are produced and originally released.

The rate of hormone biosynthesis and secretion is often regulated by a homeostatic negative feedback control mechanism. Such a mechanism depends on factors that influence the metabolism and excretion of hormones. Thus, higher hormone concentration alone cannot trigger the negative feedback mechanism. Negative feedback must be triggered by overproduction of an "effect" of the hormone.

Hormone secretion can be stimulated and inhibited by:

- Other hormones (stimulating- or releasing-hormones)
- Plasma concentrations of ions or nutrients, as well as binding globulins
- Neurons and mental activity
- Environmental changes, e.g., of light or temperature

Adrenocorticotropic hormone (ACTH)

Adrenocorticotropic hormone (ACTH or corticotropin) is a polypeptide tropic hormone produced and secreted by the anterior pituitary gland. It is an important component of the hypothalamic-pituitary-adrenal axis and is often produced in response to biological stress (along with corticotropin-releasing
hormone from the hypothalamus). Its principal effects are increased production of androgens and, as its name suggests, cortisol from the adrenal cortex.

In order to regulate the secretion of ACTH, many substances secreted within this axis exhibit slow/intermediate and fast feedback-loop activity. Glucocorticoids secreted from the adrenal cortex work to inhibit CRH secretion by the hypothalamus, which in turn decreases anterior pituitary secretion of ACTH. Glucocorticoids may also inhibit the rates of POMC gene transcription and peptide synthesis. The latter is an example of a slow feedback loop, which works on the order of hours to days, while the former works on the order of minutes.

ACTH is also related to the circadian rhythm in many organisms. The half-life of ACTH in human blood is about ten minutes.

**Structure:**

![Adrenocorticotropic steroid hormone](image)

ACTH consists of 39 amino acids, the first 13 of which (counting from the N-terminus) may be cleaved to form α-melanocyte-stimulating hormone (α-
MSH). (This common structure is one reason that patients with hypocortisolism or Addison's disease, in which ACTH levels are elevated, often present with excessively tanned skin.) After a short period of time, ACTH is cleaved into α-melanocyte-stimulating hormone (α-MSH) and CLIP, a peptide with unknown activity in humans.

**Primary effects of ACTH**

ACTH regulates steroid synthesis by the Adrenal Cortex. ACTH stimulates the secretion of cortisol from the adrenal glands. Cortisol and other glucocorticoids increase glucose production, inhibit protein synthesis and increase protein breakdown, stimulate lipolysis, and affect immunological and inflammatory responses. Cortisol induces thymus involution which is a decline in normal thymus function that in part accounts for its ability to decrease immune system response. Glucocorticoids help maintain blood pressure and form an essential component of the body's response to stress. ACTH secretion is regulated by corticotropin-releasing hormone (CRH) and vasopressin (ADH). Cortisol feeds back to the pituitary and hypothalamus to suppress levels of ACTH and CRH. Under basal (non-stress) conditions, cortisol is secreted with a pronounced circadian rhythm, with higher levels early in the morning and low levels late in the evening. Under stressful conditions, the circadian variation is blunted.

**Non-adrenal gland mediated effects**

ACTH stimulates the release of MSH (melanotropic hormone) and GH (growth hormone), increases lipolysis in fat cells (adipocytes), and induces neurological effects (such as stretching and yawning). Much of this is related to
its origins from POMC. Lipolysis by ACTH is much weaker than that of lipotropin (LPH). ACTH is a precursor of -MSH.

ACTH acts at several key steps to influence the steroidogenic pathway in the adrenal cortex:

- ACTH stimulates lipoprotein uptake into cortical cells. This increases the bio-availability of cholesterol in the cells of the adrenal cortex.
- ACTH increases the transport of cholesterol into the mitochondria and activates its hydrolysis.
- ACTH Stimulates cholesterol side-chain cleavage enzyme, which makes the rate-limiting step in steroidogenesis. This results in the production of pregnenolone.

**Aldosterone**

![Aldosterone molecule]

Aldosterone is a hormone secreted from adrenal gland which is presented on the kidneys. The effects of aldosterone hormone are far more complicated than it was previously thought. Beyond regulating sodium and volume homeostasis by its epithelial action, aldosterone hormone exhibits its effects in other organs, such as the heart, blood vessels and central nervous system. Some
of these actions are not related to the aldosterone-induced stimulation of classical mineralocorticoid receptors.

High aldosterone secretion induces oxidative stress, endothelial dysfunction, inflammation and fibrosis in the vasculature, heart and kidney.

It works primarily on kidney (renal) cells to help maintain the balance of fluids and electrolytes in our bodies. It is mainly works to control re-absorption of sodium chloride and secretion of potassium hydrogen. If aldosterone production is not functioning properly, there can be serious consequences to the heart, kidneys and electrolyte balance.

**Synthase**

Aldosterone synthase is a steroid hydroxylase cytochrome P450 oxidase enzyme involved in the generation of aldosterone. It is localized to the mitochondrial inner membrane. The enzyme has steroid 18-hydroxylase activity to synthesize aldosterone and other steroids. Aldosterone synthase is found within the zona glomerulosa at the outer edge of the adrenal cortex. Aldosterone synthase normally is not ACTH sensitive, and only activated by angiotensin II.

Steroid hormones are synthesized from cholesterol within the adrenal cortex. Aldosterone and corticosterone share the first part of their biosynthetic pathway. The last part is either mediated by the aldosterone synthase (for aldosterone) or by the 11β-hydroxylase (for corticosterone).

The adrenal cortex produces a large number of corticosteroids that are released into the circulation in response to a wide range of stressful stimuli.
Based on their biological effects, these hormones are classified as glucocorticoids (e.g. cortisol, corticosterone, cortisone, etc.) and mineralocorticoids (e.g. aldosterone). Glucocorticoids are involved in the regulation of carbohydrate metabolism, protein metabolism, lipid metabolism, oxidative metabolism, electrolyte balance, anti-inflammatory actions, immunosuppression, anti-tumour promoting activity, apoptosis, general adaptation, reproduction, growth, etc. Since glucocorticoids are essential for normal physiology and successful survival. It is essential to understand the molecular mechanism of their actions. During the last one decade, significant progress has been made in understanding the molecular basis of glucocorticoid action. The recent findings related to the structure of glucocorticoid receptor (GR), types of GR, role of chaperones in GR cycle, activation and translocation of GR and the details of mechanisms of glucocorticoid action at the DNA level.

**Aldosterone synthesis is stimulated by several factors:**

- By increase in the plasma concentration of angiotensin III.
- By increased plasma angiotensin II, ACTH, or potassium levels.
- The ACTH stimulation test is sometimes used to stimulate the production of aldosterone along with cortisol to determine if primary or secondary adrenal insufficiency is present.
- By plasma acidosis.
- By the stretch receptors located in the atria of the heart.
- By adrenoglomerulotropin, a lipid factor, obtained from pineal extracts. It selectively stimulates secretion of aldosterone.
- The secretion of aldosterone has a diurnal rhythm.
Control of aldosterone release from the adrenal cortex:

- The role of the renin-angiotensin system: Angiotensin is involved in regulating aldosterone and is the core regulator. Angiotensin II acts synergistically with potassium.
- The role of sympathetic nerves: Aldosterone production is also affected to one extent or another by nervous control which integrates the inverse of carotid artery pressure, pain, posture, and probably emotion (anxiety, fear, and hostility)(including surgical stress).
- The role of baroreceptors: Pressure in the carotid artery decreases aldosterone.
- The role of the juxtaglomerular apparatus.
- The plasma concentration of potassium: The amount of aldosterone secreted is a direct function of the serum potassium as probably determined by sensors in the carotid artery.
- The plasma concentration of sodium: Aldosterone is a function of the inverse of the sodium intake as sensed via osmotic pressure.

Miscellaneous regulation

ACTH, a pituitary peptide, also has some stimulating effect on aldosterone probably by stimulating deoxycorticosterone formation which is a precursor of aldosterone. Aldosterone is increased by blood loss, pregnancy, and possibly by other circumstances such as physical exertion, endotoxin shock, and burns.

Vasopressin

A hormone secreted by cells of the hypothalamic nuclei and stored in the posterior pituitary for release as necessary; it stimulates contraction of the
muscular tissues of the capillaries and arterioles, raising the blood pressure, and increases peristalsis, exerts some influence on the uterus, and influences re-absorption of water by the kidney tubules, resulting in concentration of urine. Its rate of secretion is regulated chiefly by the osmolarity of the plasma. Also prepared synthetically or obtained from the posterior pituitary of domestic animals; used as an antidiuretic. Called also antidiuretic hormone (ADH).

Vasopressin Hormone

Arginine vasopressin (neurophysin II, antidiuretic hormone, diabetes insipidus, neurohypophyseal)

Arginine vasopressin (AVP) is a non peptide hormone produced in magnocellular neurons of the hypothalamus, which functions as an antidiuretic in the kidney and systemically as a regulator of vasoconstriction, blood volume, and blood pressure. AVP acts by binding to a set of specific seven transmembrane domain-containing G-protein coupled receptors (GPCR) classified into three groups: V1a (V1), V1b (V3), and V2. V1b receptors stimulate adrenocorticotropic hormone (ACTH) release in the anterior pituitary, but may also participate in corticotropin-releasing hormone (CRH) release by the hypothalamus. The V1b receptor signals through coupling of Gq/11 alpha
subunits, activating phospholipase C and release of intracellular Ca2+ via phosphoinositide second messengers. V1b receptor overexpression is a common marker for ACTH-secreting corticotropic adenomas. V2 receptors in the collecting ducts of the kidneys stimulate adenylyl cyclase activity, regulating the reabsorption of water via aquaporin channels.

**Physiology Function**

In Kidneys, AVP increases the permeability to water of the distal convoluted tubules and collecting tubules in the nephrons of kidneys and thus allows water reabsorption and excretion of a smaller volume of concentrated urine - antidiuresis. This occurs through insertion of additional water channels (Aquaporin-2s) into the apical membrane of the tubules/collection duct epithelial cells. The aquaporin allows water to pass out of the nephron (at the distal convoluted tubules and the collecting tubules) and into the cell, increasing the amount of water re-absorbed from the filtrate.

V2 receptors, G protein-coupled receptors coupled to Gs, on the basolateral membrane of the cells lining the distal convoluted tubules and conducting tubules (in the nephron) have an active site for AVP. The G protein, which is in contact with the V2 receptor inside the cell, move to adenylyl cyclase, triggering adenylyl cyclase to convert ATP into cAMP, plus 2 inorganic phosphates. The cAMP cascade then triggers the insertion of Aquaporin-2 water pores by exocytosis of storage vesicles.

The repressor protein that regulates the gene for protein kinase A (PKA) has a binding site for cAMP, causing the repressor protein to change its shape and leave the operator region of the gene. This allows for transcription of the
gene for PKA. PKA then signals ATP to dephosphorylate, providing energy for vesicles (which contain aquaporin channel proteins in their membranes) to fuse with the apical membrane of the cell. Calcium ions may also be required in this process. Therefore it may be possible that, PLC (phospholipase C-beta) has an associated role. It should be noted that PLC can be activated by a G-protein coupled receptor.

AVP also increases permeability of the papillary portion of the collecting duct to urea, allowing increased reabsorption of urea into the medullary interstitium, down the concentration gradient created from the removal of water in the cortical collecting duct.

Another renal role for AVP is that it stimulates sodium reabsorption in the thick-ascending loop of Henle.

In cardiovascular system Vasopressin increases peripheral vascular resistance and thus increases arterial blood pressure. This effect appears small in healthy individuals; however it becomes an important compensatory mechanism for restoring blood pressure in hypovolemic shock such as occurs during hemorrhage.

In central nervous system (CNS), Vasopressin released within the brain has many actions:

- It has been implicated in memory formation, including delayed reflexes, image, short- and long-term memory, though the mechanism remains unknown, and these findings are controversial. However, the synthetic
vasopressin analogue desmopressin has come to interest as a likely nootropic.

- Vasopressin is released into the brain in a circadian rhythm by neurons of the suprachiasmatic nucleus of the hypothalamus.
- Vasopressin released from centrally-projecting hypothalamic neurons is involved in aggression, blood pressure regulation and temperature regulation.

In recent years there has been particular interest in the role of vasopressin in social behavior. It is thought that vasopressin, released into the brain during sexual activity, initiates and sustains patterns of activity that support the pair-bond between the sexual partners; in particular, vasopressin seems to induce the male to become aggressive towards other males.

**OBJECTIVES OF THE STUDY**

The purpose of this study to analyze the effect of yoga practice on selected hormone secretions, and bio-motor ability, among women hockey players. The study is hoped to help;

- In motivating the subjects to practice and participate in yogic asanas and pranayama as a daily physical activity.
- In various kinds of bio-motor activities; physical activities geared up to its optimum level through yogic practices.
- In achieving high level of bio-motor ability with the impact of yogic practice, with less consumption of energy and time.
- In achieving hormonal balance with the impact of yogic practice, with less consumption of energy and time.
• In enhancing the status of yoga as a daily physical activity highly essential for every individual from childhood through the adulthood.
• To give some impetus to the movement of physical education and physical fitness and to inform the concerned section of the society about the yogic practice to avoid weaknesses and improve strength of the body through the physical education programmes.
• Provide a very inexpensive and economic system to regulate and tone up the human infrastructure to its optimum level.
• This study will provide how bio-motor abilities can be developed which are basis for the development for any game or skill through yogic practice and pranayama.

STATEMENT OF THE PROBLEM

The performance of players depends upon his bio-motor ability, up to a very high extent; the easier process should be incurred to develop the bio-motor ability. In the light of the above statement, the yoga might be very useful. But it is economical in terms of both time and money.

When a person acts against the resistance of his own body, it causes the development of strength. During the practice of yoga a person’s act is not only against his body resistance but some other short of movement is also involved. This has created an interest in the researcher to find out whether yoga asana and pranayama have any effect upon bio-motor ability and hormone secretion in the endocrine system or not, and the effect of hormones in developments of bio-motor ability. Hence the researcher has selected the topic which is stated as, impact of yogic practices, on selected hormones and bio-motor ability among women hockey players.
HYPOTHESES

The systematic practice of yogasanas and pranayama has been undertaken and the following hypotheses are formulated.

1. There would be significant changes of Adrenocorticotrophic hormone (ACTH) secretion by practising of yogasana and pranayama.
2. There would be significant changes of Aldosterone hormone secretion, by practising of yogasana and pranayama in the experimental group.
3. There may be significant changes in vasopressin hormone, by practising of yogasana and pranayama.
4. There may be significant improvement might exist on speed, by practising of yogasana and pranayama.
5. There may be significant improvement might exist on cardiorespiratory endurance, by practising of yogasana and pranayama.
6. There may be significant improvement might exist on muscular strength by practising of yogasana and pranayama.
7. There may be significant improvement might exist on flexibility by practising of yogasana and pranayama.

DELIMITATIONS

The present study was delimited in the following ways:

1. The subjects were taken only from Chittoor district Hockey Assosiation (Women) Team and Cuddapa district Hockey Assosiation (Women) Team.
2. The subjects were restricted to 16 players from each District Association team.
3. Cuddapa District Hockey Association (Women) players were treated as a Control group.

4. Chittoor District Hockey Association (Women) players were treated as an Experimental group.

5. The age of the subjects ranging between 17 and 19 years.

6. All the subjects of experimental groups were given daily practice of yogasanas and pranayama for half hour duration in the morning and the experimental treatment continued for six days in a week, up to 12 weeks.

7. The selected hormones ACTH, Aldostirone, and Vasopressin test were assessed through Blood plasma analysis test by RIA (Radioimmunoasay).

8. The selected bio-motor variables are tested for the study is as follows;
   a) Speed assessed by 50 meters run Test.
   b) Cardio respiratory endurance assessed by Harvard step Test.
   c) Muscular endurance assessed by Sit-ups Test.
   d) Flexibility assessed by Sit and Reach Test.

9. Pre-test data on selected hormones (ACTH, Aldostirone, and Vasopressin) were collected before participation of the competition and selected bio-motor variables (Speed, Cardio Respiratory Endurance, Muscular Strength & Flexibility) were collected on next day.

10. Post-test data were collected after 12 weeks of experimentation, as same way of pre-test.

LIMITATIONS

The following factors were considered as limitations in the study.

1. The meteorological variations such as air, temperature, atmospheric pressure, relative humidity etcetera, during the testing periods could not
be controlled and their possible influence on the results of the study was recognized as a limitation.

2. The subjects selected for the study were non-residential women hockey players with different economical background. Therefore, variations in their living conditions, life style, diet etc., were recognized as a limitation of the study.

3. The differences in coaching of the control and experimental groups was considered as one of the limitation.

4. The previous experience of the subjects in the field of sports and games which might be influencing on the training and data collection were not considered.

5. The investigator did not put any effort to control or assess the quality and quantity of food ingested separately for each individual.

6. The quantum of physical exertion, lifestyle and physiological stress and other factors that affect the metabolic functions were also considered as limitation.

SIGNIFICANCE OF THE STUDY

In present day’s exercise physiologists, sports psychologists, coaches and Physical Educationists are preferring yoga and it is introduced in the centers of teaching and learning. The significance of the study is based on the fact that yogasanas and pranayama can be a valuable tool to improve the psychological, biological, and physiological fitness capacities. The present study will contribute in the following way.

1. The purpose of this study is to investigate to find out the effect of yogasana and pranayama on level of selected hormone (ACTH, Aldostirone, and Vasopressin) secretions in endocrine system and
strength of bio-motor variables (Speed, Cardio Respiratory Endurance, Muscular Strength and Flexibility) variations before and after experimentation among hockey players (women).

2. The results of the study would be of great interest to exercise physiologists, physical education experts, yogis, yoga therapists, coaches and athletes, as they would be able to assess the changes in psychological, biological, physiological and motor fitness variables for efficient performance.

3. The findings of the study will be of great value in designing and administrating, yoga therapy camp, yoga awareness camps motor fitness programmes and remedial exercises for hormonal balance, those who need such special attention.

4. The results of the study will be useful for coaches to use yoga as a relaxation technique to improve the performance in the women players.

5. The results of the study will be useful to overcome stress and strain, mental.

DEFINITION OF THE TERMS

Yoga

Yoga is the system of philosophy and practice of esoteric meditation having as object the union of the individual human spirit with that of the universe. (Harry Ceal Myld, et al., 1970).

Yoga is a method by which one can remove ignorance, the cause of main folders and thus attain union with supreme self (Swami Pavithrananda 1985).

Yoga is the science of right living and, as such, is intended to be incorporated in daily life. It works on all aspects of the person: the physical,
mental, emotional, psychic and spiritual (Swami Satyananda Saraswathi, 1999).

Yoga asana

The word asana means “easy comfortable” and so the postures should be to have their full effects. These are special patterns of postures that stabilize the mind and body through static stretching. Their aim is to establish proper rhythm in the neuromuscular tonic impulses and improve the general muscle tone (Alain Danielow, 1955).

“Sthiram Sukhan Asanam”, meaning that position which is comfortable steady. Raja yoga equates yogasana to the stable sitting position. In Hatha yoga pradeepika said, control of the body and mind energy with practice. Yogasana is the tools to higher awareness, providing the stable foundation necessary for the exploration of the breath body and mind in higher states.

Pranayama

Pranayama is derived from prana (breath) and Yame (cessation). It advocates holding the breath for a while between puraka (inhalation) and rachaka (exhalation) can however over done (Desmond Dunne, 1958).

Pranayama means control of life force through art of breathing (Jayadeva Yogendra, 1965).

Pranayama means breath control. In Sanskrit, Prana means breath and ayama means a control. In modern literature on yoga, Prana, even in the
compound pranayama has been often interpreted to mean a subtle psychic force or a subtle cosmic element (Swami Kuvalayanada, 1966).

According to Geore, Prana means a subtle life force which provides energy to different organs (including mind) and also control many vital life processes (e.g. circulation, respiration etc.). Ayama signifies the voluntary effort to control and direct this prana (Geore. M, et al., 1984).

The prana means life-force, or the vital energy or that force by which we have our life. Ayama means control i.e. control of the breath (Swami Abhedananda, 1983).

**Hormone**

The definition of hormone from Sports Science and Medicine “A chemical produced in one part of the body, which has its effects on another part (target cells). Endocrine glands are the sites of secretion. The bloodstream transports the hormones to their target tissues. Hormones act as chemical messengers, helping to regulate specific body functions”.

**Speed**

Speed is the ability to perform a movement in a short period of tune (Charles B. Corbin and Ruth Lindsay, 1978).

The ability to move the whole body or parts of it from one point to another as quickly as possible (Ghosh. A, 1975).
Speed may be referred to the time taken into co-ordinate joint actions or to transport the whole body through space (Rex Hezeldine, 1985).

**Cardiovascular Endurance**

“Cardiovascular endurance is the ability of the heart and circulatory system to deliver oxygen and nutrients to the entire body efficiently (Ramkumar 1996).

It is the ability of the heart, blood vessels, blood and respiratory system to supply fuel, especially oxygen, to muscles during sustained exercise (Charles B. Cornin and Ruth Lindsey 1978).

Circulatory – respiratory endurance has been defined by Mathews and Fox as “The ability of the lungs and heart to take in transporting adequate amounts of oxygen to the working muscles, allowing activities that involve large muscle masses, to be performed over long periods of time. Cardio – respiratory endurance has an additional implication as to recover from severe exercise” (Donald K. Mathews and Edward L. Fox, 1976).

“It is the capacity of the circulatory – respiratory system to function during sports or other physical activities, which require sustained effort”, (Margaret J. Safrit, 1981).

“Cardiovascular endurance is the ability to continue activities that tax the cardiac, circulatory and respiratory functions” (Don Franks and Helda Densch. B, 1973).
Cardio Vascular Endurance is test for ability of him circulatory and respiratory system to adjust to and recover from the effects of exercise or work” (Barry L. Johnson & K. Nelson 1982).

Cardio vascular, respiratory endurance is measured by the clasped time required distance covered. This cardio respiratory system helps oxygen consumption for energy due to longer duration activity.

Muscular Strength

Muscular Strength is defined by the ability of your body's muscle to generate force in a short period of time. Muscular strength should be apart of anyones training program. Training for muscular strength should consist of 2-4 repetitions and muscular failure should occur. Creatine Phosphate and Carbohydrates are the primary source of ATP during this quick training phase.

Muscle strength refers to the amount of force a muscle can produce with a single maximal effort. Size of muscle cells and the ability of nerves to activate them are related to muscle strength. (Jennifer R. 2008)

Muscular strength is defined as the maximum amount of force that a muscle can exert against some form of resistance in a single effort. (Matt 2009).

Flexibility

“Flexibility is the range of motion available in a joint (Charles B. Corbin and Ruth Lindsey, 1978)
“The ability to move a joint through its full range of motion is defined as flexibility (Ghosh. A 1975).

“It is the flexibility to flex and extend the joints through their full intended range of motion (Ramkumar 1996).