



ALAGAPPA UNIVERSITY

[Accredited with 'A+' Grade by NAAC (CGPA:3.64) in the Third Cycle
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(A State University Established by the Government of Tamil Nadu)

KARAIKUDI – 630 003



Directorate of Distance Education

P.G. Diploma in Yoga

I - Semester

426 13

SCIENTIFIC APPROACHES OF YOGA

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E-28, Sector-8, Noida - 201301 (UP)

Phone: 0120-4078900 • Fax: 0120-4078999

Regd. Office: 7361, Ravindra Mansion, Ram Nagar, New Delhi 110 055

• Website: www.vikaspublishing.com • Email: helpline@vikaspublishing.com

Work Order No. AU/DDE/DE1-484/Printing of Course Materials/2019 Dated 08.07.2019 Copies-500

SYLLABI-BOOK MAPPING TABLE

Scientific Approaches of Yoga

Syllabi	Mapping in Book
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INTRODUCTION

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Yoga is essentially a spiritual discipline based on an extremely subtle science, which focuses on bringing harmony between mind and body. It is an art and science of healthy living. The word 'Yoga' is derived from the Sanskrit root 'Yuj', meaning 'to join' or 'to yoke' or 'to unite'. As per Yogic scriptures, the practice of Yoga leads to the union of individual consciousness with that of the Universal Consciousness, indicating a perfect harmony between the mind and body, Man and Nature.

According to modern scientists, everything in the universe is just a manifestation of the same quantum firmament. One who experiences this oneness of existence is said to be in yoga, and is termed as a yogi, having attained a state of freedom referred to as mukti, nirvana or moksha. Thus, the aim of Yoga is self-realization, to overcome all kinds of sufferings leading to 'the state of liberation' (Moksha) or 'freedom' (Kaivalya). Living with freedom in all walks of life, health and harmony shall be the main objectives of Yoga practice. "Yoga" also refers to an inner science comprising of a variety of methods through which human beings can realize this union and achieve mastery over their destiny. Yoga, being widely considered as an 'immortal cultural outcome' of Indus Saraswati Valley civilization – dating back to 2700 BC, has proved itself catering to both material and spiritual upliftment of humanity. Basic humane values are the very identity of Yoga Sadhana.

This book, *Scientific Approaches of Yoga* has been divided into fourteen units. The book has been written in keeping with the self-instructional mode or the SIM format wherein each Unit begins with an Introduction to the topic, followed by an outline of the Objectives. The detailed content is then presented in a simple and organized manner, interspersed with Check Your Progress Questions to test the student's understanding of the topics covered. A Summary along with a list of Key Words, set of Self-Assessment Questions and Exercises and Further Readings is provided at the end of each Unit for effective recapitulation.

BLOCK - I**PSYCHOLOGICAL CHANGES OF YOGA**

UNIT 1 CELL AND TISSUES

NOTES**Structure**

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- 1.1 Objectives
- 1.2 Cells
 - 1.2.1 Healthy Cells and Yoga
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1.0 INTRODUCTION

Yoga has been practiced in India for more than three thousand years. It has gained popularity in other parts of the world as well. Yoga is a mixture of stimulating postures and breathing in form of meditation. This combination helps the practitioners of yoga to attain a harmony between their mind and body and as a result, enhancing their overall wellbeing.

The purpose of yoga is to stretch each and every muscle of the body. The stretching of the muscles helps in stretching the nerves and the glands as well. The fact that it touches every part of the body for this reason its practice is recommended for people suffering from Type 2 diabetes, breathing problems like asthma, mental health ailments like bipolar affective condition, and furthermore it has been effective in treating people in advanced stages of cancer.

1.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the types of cells and how yoga helps at cellular level

- Examine the epithelial tissue and its various types
- Explain the various types of muscles and impact of yoga on tissues and muscular level

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1.2 CELLS

There is no denying the fact that yoga is tremendously beneficial and implementing its various forms into daily routine is bound to improve the overall health. Practicing any form of yoga, hatha yoga or simple breathing exercises will lead to mental and physical wellness. The ancient yogis and practitioners believe that the impact of yoga can even affect the cellular composition of the body and in recent times various studies have been carried out in order to confirm this belief.

The body replicates and produces approximately two million fresh cells every second. During the day, above hundreds of billion fresh cells are produced. These cells are not only essential for development of the body but they also have other essential roles, they produce varied proteins required for functioning of various body parts. Sometimes the occurrence of cells in such large numbers may lead to malfunctioning as well. However, the body has a systematic system for the malfunctions cells to be repaired. The system ensures that the transformed cells are mostly destroyed. The destroyed cells have to be expelled carefully as they carry harmful substances, and sudden expulsion may lead to necrosis.

Some of the substances within the cells may spread their toxicity to cells nearby and this could cause inflammation or cytotoxicity. In cases when the cell is destroyed with regulated process the harmful substances do not escape and harm the other cells, the regulated procedure is known as apoptosis.

There are many factors causing cell necrosis, these could range between trauma through physical exertion or toxins and pathogens. In times when the body suffers from a disease or an ailment the complete cell building process goes haywire. The process is also interrupted due to high temperature and stress. A minor fluctuation in the temperature could disrupt protein levels of the cell and lead to their destruction. Environmental stress also have a direct impact on the levels of the cells, the impact is extensive as it might negatively affect the family genetically. There is a need to prevent this from occurring. The positive side of all this is that the body has its own ways of tackling the threats to the cells and a healthy body is able to reasonably reduce the damage. Practicing regular yoga is one effective way to stop processes such as cytotoxic necrosis from occurring.

1.2.1 Healthy Cells and Yoga

The notion that practicing yoga has an impact on the health of the cells is not new. The notion was the basis of the basic philosophy of the yogic practitioner and preacher Sri Aurobindo. He was of the belief that all humans are interim beings

living in a cerebral consciousness and their primary aim is to establish and develop to the greater “supramental” consciousness. He believed that humans possessed divine consciousness same as the divine powers but the only difference was that they needed to experience many more stages prior to the attainment of this realisation.

The philosophy of the yogic practitioners was of the implication that man was a part of an evolution in the reverse order and due to this his consciousness was distributed into several unrelated illustrations and these could be connected with each other only with the help of yogic practices. This implied that every cell contained consciousness that had to be roused. The practice of yoga helps in uniting the divine consciousness inside the human body and this process begins at the level of the cells. There were many researches carried out in order to establish the relation that existed between the philosophy, meditation and health of the cells.

Scientific studies on the effects of meditation and other forms of yoga such as hatha yoga have established the benefits of the practice. According to one such study it was established that meditation has a profound relaxing impact and this has a direct benefit on neural plasticity. Brains of people practicing transcendental meditation are known to possess relatively greater grey matter in specific parts. This part is filled with cellular bodies, neuron and synapses. All these are important for the functioning of the human nervous system. The neuronal cells present in the grey matter are primarily accountable for controlling speech, emotions, muscles and memory.

There is enough evidence to prove that practicing of hatha yoga improves cellular health. Few postures of yoga which involve stretching helps in regenerating b-Cells present in the pancreas helping to increase the glucose metabolism and insulin receptors. The stretching of these postures also helps in reflexing of the lung muscles and cardiorespiratory health; this is because the count of RBC increases in the body.

State of Mind and Cellular Health

The scientists continue to remain puzzled on the ability of human consciousness controlling their actions. There are few theoretical physicists who have begun to relate this to quantum physics due to the number of resemblances amid the strange and occasionally incomprehensible quantum effects and the mystery of the brain’s conscious activity. The scientists have started to refer this notion as the concept of quantum consciousness.

According to physicist Richard Penrose, there is a strong probability that the brain’s molecular structures are able to modify as per the reaction of a quantum event. In his theory, orchestrated objective reduction, he has basically stated that substances bigger than atoms are dependent on the gravitational law and the laws of Newton in the field of physics. However, substances smaller or same do not fall

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under this category rather they come under the strange quantum laws, here they are able to be present in more than one place at a time.

This theory was furthered by physicist, Matthew Fisher. He suggested the notion of the microtubules, or the strands of protein connecting the human cells and the neurons of the brain have the capability to be present in more than one place at a time. The basic notion of his theory is that the brain's neurons are able to get entangled with different cells, and are able to have an impact on the cells.

If one was to agree with the above theories of quantum physics then it can be comfortably stated that the human conscious thoughts are able to have an impact on the cells of the body with the help of a consciousness of the cells. This is on the same lines as the biology phenomena of photosynthesis that is a part of the same quantum mechanism. Plants are capable of converting light as a form of energy at the level of the cells therefore it is not impossible to imagine that humans are able to transform conscious energy at a cellular level. And the only way to achieve this would be with the help of yoga, as the practice helps in focusing on conscious energy.

Check Your Progress

1. How many cells does the body produce every second?
2. What is apoptosis?
3. How does the practice of yoga help?
4. What is the theory of orchestrated objective reduction?

1.3 TISSUES

All cells are not equal, the cells have a lifespan and during this span they undertake several processes, they try to dedicate themselves to a specific function — a nervous cell and a muscular cell will have some similarities even though their functions are not same. Once the cells that are similar to each other club together in order to perform a specific task they are known as tissues. The human body has four types of such tissues, namely:

- Nervous tissues
- Muscular tissues
- Epithelium tissues
- Connective tissues

1.3.1 Nervous Tissue

Nervous tissues are regarded as central tissues as they consist of the brain and spinal cord and also the peripheral nerves. It consists of two main kinds of cells, the neurons (nerve cells) and glial cells.

Neurons: The essential communicative functions of the nervous tissue are carried out by the neurons. They form the basic structure of the nervous system and are also the essential functioning part as they are involved in relaying signals swiftly to all other cells in various parts of the body. The shapes and size of the neurons depends on its function and position, each part of the neuron has a specific function to perform. The parts are specialised for the functions they have to perform. There are many dendrites in a cell and they have the function of receiving the information provided by various cells of the nervous system. There is only one axon in every cell and its major function is to disperse information. The neurons are greatly affected by the state of human mind as they are capable of reacting to different bodily and chemical impetuses. Further they are also able to convey this reaction to other parts of the body.

Glial Cells: These cells make up for the remaining part of the nervous system. They are completely varied from their counterpart. The cells have a separate network of communication. They assist the neurons by protecting and supporting them. The cells also help in regulating the informational flow among the neurons. The glial cells supply the nutrition and assist the nerve cells to perform their functions efficiently. The cells are present in the nervous system in various shapes and sizes.

1.3.2 Muscle Tissue

Muscle tissues are made up of specialized stretched out contractile cells. These cells are able to perform their functions as they develop a tension beside their longitudinal axes. The tension is possible because of the presence of particular proteins, actin, myosin and troponin, their presence allows the cells to condense and elongate and because of this contraction a movement mechanism is created within the internal organs and thus enabling the entire body to move. Yoga helps in strengthening the muscular tissues of the body, the postures of yoga help in increasing the flexibility and agility of the body.

When the muscle fibres group together they create fasciculi /fasciculus referring to a tiny bundle of tissues and several fasciculi together form the muscles. The body has three main kinds of muscle tissues, namely:

- Skeletal muscles are connected to the bones in the body
- Cardiac muscles are located in the heart
- The muscles located in the vessels, skin and all internal organs of the body are known as smooth muscles.

All the muscle tissues of the body are regulated with the help of nerves, hormones, local chemicals. Some are controlled by the muscle tissue themselves; this depends on their position and their type.

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1.3.3 Epithelial Tissue

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The human body contains several kind of epithelial tissue. The cells are organised in form of sheets. The surface of all body parts, externally and internally is covered with epithelial tissue. It stays on the lower part of the membrane, providing a stable ground to the cells. The entry and exit of all the matter in the body has to pass the epithelial membrane and therefore the basic function of the tissue is to provide safety, help in absorption and secretion of matter.

The classification of the epithelial tissue is dependent on the form of the cells and number of layer of membrane. The layers could be simple, stratified or pseudostratified. There is a particular type of epithelium called the endothelium. This forms the blood walls and lymph of the vessels. The epithelium tissue in the bladder and the ureters is able to expand and contract. The nourishment for the epithelial tissue happens due to the diffusion of blood vessels positioned in the underlying connective tissue since the epithelium tissue does not have a blood or lymph vessel.

There are three main types of epithelial tissues, namely,

- (i) **Squamous Epithelium Tissue:** This is a distinct layer of flat cells in touching base with the basal lamina of the epithelium. This kind of epithelium is frequently penetrable and comes about when tiny molecules have to rapidly pass by the membranes with the help of percolation or diffusion. These are found in places where swift diffusion is needed such as the capillaries, alveoli, glomeruli, etc. The cells are shaped flat and contain compressed and four-sided shaped nuclei. Due to its functions it is an exceedingly thin tissue and creates a very fragile coating thus providing no safety.
- (ii) **Cuboidal Epithelium Tissue:** The tissue is cube like consisting of a single layer of cells. The cells have enormous, sphere-shaped and central nuclei. They are located on the ovary surface, the lining of nephrons, the walls of the kidney tubules, and in some parts of the eye and thyroid. The surface is used for secretion and absorption.
- (iii) **Columnar Epithelium Tissue:** This is single-layered tissue and it forms the lining of almost every organ of the human body's digestive system. The tissue is found in the lining of stomach and both small and large intestine, it also lines the uterus.

Epithelial tissue also produces the under growth in the underlying connective tissue, these are known as the glands, comprise of cells and secretion and excretion are their main functions. The two main glands of the body are exocrine glands and endocrine glands.

1.3.4 Connective Tissue

The prominent feature of connective tissues is their extracellular matrix (ECM). These are those parts of tissues that do not form a part of the cells. The body has five main connective tissues, namely blood, bone, loose, dense and cartilage. The main function of the connective tissue is to connect, hold and support various tissues and cells of the body. The three main components of connective tissues are cells, extracellular fibres and extracellular ground substance.

Connective Tissue Cells

Cells present in the connective tissues deliver protection and help in the production of the structure required to support the tissue. Few cells continue to be a part of the connective tissue and perform the task of maintaining the tissue. For instance fibroblasts those are in charge for the creation of collagen, elastin and ground substance that include the extracellular component of connective tissue are mesenchymal cells and adipose cells for storing fat.

There are some cells that wander and come into the connective tissue as a result of an injury or incursion by microorganisms. These are mostly the mast cells, antibody secreting plasma cells and the trash collecting macrophages. Mast cells are extensively disseminated in connective tissue and are mainly plentiful in the small blood vessels. They have several particles that help in preventing clotting of blood and also help in growing the penetrability of capillaries and venules, consequently permitting cells of other parts to enter the connective tissue through the blood in order to combat external attackers.

Secretion of the fibroblast produces the extracellular fibres, and in turn, they provide strength to the connective tissue. Extracellular fibres are of three types, the first one is called collagen fibres, their composition is of protein collagen, with high tensile power and rigidity. The second type is known as reticular fibres; these are extremely thin collagen fibres and create fragile networks around the blood vessels, nerves and some of the other cells. The third type is known as elastic fibres, and these comprise of the protein elastin. They have good stretching ability although they retain their actual length. They are found in abundance in tissues requiring flexibility, for instance, the ligamentum nuchae located in the rear part of the neck.

Ground substance is the term for the unstructured, jelly-like material found within the cells and fibres of connective tissue. The ground substance is made up of water, proteoglycans, constituents of the plasma, metabolites and ions. The substance functions as the source of nourishment, the nutrients are diffused from the blood vessels in order to give food to the cells and the unwanted products may be diffused into the blood stream.

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Blood is a liquid connective tissue containing cells that are suspended in a liquid condition known as plasma. Plasma is made up of water, protein and other solutes. Blood cells contain erythrocytes (RBCs), leukocytes (WBCs), and platelets.

Loose Connective Tissue or Adipose Tissues: is made up of plenty of cells and ground substance, however comparatively very few fibres. For this reason it is lax and flexible and acts as a type of a packaging and stuffing amid tissues and other body parts. The tissue is located between muscelskeletaes, permitting free movement and support for the tiny blood vessels, lymphatic vessels and nerves. Once fat is filled inside these loose connective tissues are called adipose Tissue.

Dense or Fibrous Connective Tissue: It is made up of large quantities of fibres and they are reasonably low in cells and ground substance as compared to loose connective tissue. There are four kinds of dense connective tissue, namely, fascia, tendons, ligaments, and aponeuroses.

Cartilage: It is a type of connective tissue which is comparatively more firm than the dense connective tissue. It contains a network of densely populated fibres made up of a jelly-like material within the cells. This helps in keeping it sturdy and flexible at the same time. The cells of cartilage are known as chondrocytes. There are no blood vessels in the cartilage as a result the cells are completely relying on diffusion for all their nutritional needs as well as oxygen. Cartilages are of three kinds and shaped according to their functions and presence of their ground substance.

Elastic cartilage contains many elastin fibres, this allows it to be extremely supple and whenever its shape changes it is able to revert to its actual form. The cartilage is located in the ear's auricle.

Hyaline cartilage is distributed all over the body; it contains elastin in very small quantity and is made up of mainly the collagen. The cartilage on full maturity replaces the bone tissue and stays at the end of the bone. It provides support to the nose, larynx, trachea and for the bronchi in the respiratory system.

Fibrocartilage consists of elastin along with collagen. It is the most plentiful cartilage as per its weight. Its presence is mostly at places where there is regular stress. The tissue is located in the intervertebral discs, the menisci of the knees and the pubic symphysis.

Bone amongst all the connective tissue is considered to be extremely rigid. It is much more firm as compared to the cartilage. The presence of calcium phosphate in the bones is the cause for its rigidity. The bare minimum flexibility in the bones is due to the organic collagen fibres present in them. Bone cells are known as osteocytes. The bone has a tiny tubular canal helping it to attain its nourishment. The bones in the body are of two types, compact and spongy.

Tendons and Ligaments: A tendon is a fibrous connective tissue that connects the muscle with the bone. Tendons could help in connecting muscles to

structures as seen in the eyeball. Tendon helps in the movement of bone as well as the structure.

Ligament is a fibrous connective tissue that helps in connecting the bones with each other. They also provide support and stability to the structures they are attached to in the body.

1.4 HEALTHY TISSUES AND YOGA

The connective tissues help in allowing the fluids to move in the body without friction. The energy in the body flows because of the connective tissues and healthy tissues help in maintaining and supporting the body's normal stretched out stance and also help in creating a harmonious functioning system between the various organs of the body. They are like a river flowing all over the body.

The condition of the connective tissue has a direct impact on the degree of overall health and wellbeing. Healthy tissues will help the body to move smoothly and reduce the strain on the muscles.

The frequent feeling of tightness in the body or lack of energy does not always denote strained muscles, in fact this discomfort is also indicating the tenseness and scarring of the connective tissue, their unhealthy state is hampering the energy to flow within the body.

People often complain about tautness in their neck and shoulder areas. This is directly connected with the tissues of these parts. Most often people find relief in form of pain-relieving medication or a massage, but these are temporary treatments and the problem persists. The problem will only be resolved once it is addressed properly and permanent solutions are applied. One of the major solutions to get rid of tautness in the body is through the practice of yoga.

Yoga helps in feeling every movement of the body. It emphasises that movement of the body should be part of active consciousness. It helps in releasing the tension and stress of the connective tissues. The body is affected by every movement and action. The harshness of the action has a direct impact on the joints, muscles and the tissues. Gentle movements have a calming effect not only on the mind but also on the other parts of the body.

Exercises that help in stretching and strengthening the body need to be performed gently. The harsh stretching does provide temporary relief to the body but in the long-run it is only harming the body. The correct stretch will help in releasing stress from the entire body and help in relaxing the tissue and the muscles of the body.

Working out the body with respect and taking care of the connective tissue conveys a meditative worth to the workout. The process becomes healing as well as nourishing for the body.

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Practice of yoga affects the joints and connective tissues tremendously. According to Paul Grilley, *“it is not muscular strength that gives us the feeling of ease and lightness in the body, it is the flexibility of the joints, of the connective tissue”*. Yoga helps in understanding the mechanical network of the ligaments, tendons and fascia and other connective tissues. The extent of the joints manoeuvrability is closely related to the suppleness and the state of the tissues in the deep layer of the joint structure. Yoga in recent times is used by several orthopaedic therapists; they apply the forms in order to treat several ailments related to the joints. It is essential to realise that the body’s tissues are able to alter and adapt to different levels and in case they are not made to workout correctly they are bound to become frail and ultimately wither.

The postures of yoga help in exercising the tissues in a comfortable manner. The postures of yoga are held for a couple of minutes, this practice helps in making the body part realise that it is being exercised and also helps in stretching and strengthening of the part. According to Grilley, *“the joints can be safely and desirably exercised by gently stretching them”*. The practice not only relaxes but also encourages the muscle to contract. This helps in elongating and strengthening the tissues.

Yoga helps in working out the connective tissues and therefore prevents their degeneration, avert fixation and maintains mobility by providing healthy flow of energy in the body. Connective tissues are cells rich in fluids and for this reason it is essential to keep them constantly hydrated, exercising them not only improves their the space between the joints but also helps in their hydration. The flow of energy is stimulated to such an extent that it is able to harmonise the structures of the skeleton and the muscles as well. Yoga helps in building internal as well as external flexibility. The benefits of Yoga may be categories in three ways, first it helps in relieving stress and leads to relaxation, secondly it helps in increasing the mobility of the body by making it more flexible and open, and finally it helps in self-transformation through meditation.

The impact of yoga can be felt in every cell and tissue of the body. The body not only strengthens with its practice but it is able to communicate better as functions of all the organs improve. The practice of yoga helps in making the body resistant to several ailments. Yoga acts as a balancing factor as it provided peace and calm to the mind by bringing positive thoughts. The practitioners of yoga experience a feeling of overall wellbeing.

Check Your Progress

5. Name the four main types of tissues.
6. What are muscle tissues made up of?
7. Name the three main types of epithelial tissue.
8. What is hyaline cartilage?

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1.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The body replicates and produces approximately two million fresh cells every second. During the day, above hundreds of billion fresh cells are produced.
2. In cases when the cell is destroyed with regulated process the harmful substances do not escape and harm the other cells, the regulated procedure is known as apoptosis.
3. The practice of yoga helps in uniting the divine consciousness inside the human body and this process begins at the level of the cells.
4. The theory of orchestrated objective reduction stated that substances bigger than atoms are dependent on the gravitational law and the laws of Newton in the field of physics. However, substances smaller or same do not fall under this category rather they come under the strange quantum laws, here they are able to be present in more than one place at a time.
5. The four main types of tissues are nervous tissue, muscular tissue, epithelium tissue and connective tissue.
6. Muscle tissues are made up of specialized stretched out contractile cells.
7. Three main types of epithelial tissue are: Squamous epithelial tissue, cuboidal epithelial tissue, and columnar epithelial tissue.
8. Hyaline cartilage is distributed all over the body; it contains elastin in very small quantity and is made up of mainly the collagen. The cartilage on full maturity replaces the bone tissue and stays at the end of the bone. It provides support to the nose, larynx, trachea and for the bronchi in the respiratory system.

1.6 SUMMARY

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- Yoga has been practiced in India for more than three thousand years. It has gained popularity in other parts of the world as well. Yoga is a mixture of stimulating postures and breathing in form of meditation. This combination helps the practitioners of yoga to attain a harmony between their mind and body and as a result, enhancing their overall wellbeing.
- There is no denying the fact that yoga is tremendously beneficial and implementing its various forms into daily routine is bound to improve the overall health. Practicing any form of yoga, hatha yoga or simple breathing exercises will lead to mental and physical wellness. The ancient yogis and practitioners believe that the impact of yoga can even affect the cellular composition of the body and in recent times various studies have been carried out in order to confirm this belief.
- The notion that practicing yoga has an impact on the health of the cells is not new. The notion was the basis of the basic philosophy of the yogic practitioner and preacher Sri Aurobindo. He was of the belief that all humans are interim beings living in a cerebral consciousness and their primary aim is to establish and develop to the greater “supramental” consciousness.
- There is enough evidence to prove that practicing of hatha yoga improves cellular health. Few postures of yoga which involve stretching helps in regenerating b-Cells present in the pancreas helping to increase the glucose metabolism and insulin receptors. The stretching of these postures also helps in reflexing of the lung muscles and cardiorespiratory health; this is because the count of RBC increases in the body.
- Human conscious thoughts are able to have an impact on the cells of the body with the help of a consciousness of the cells. This is on the same lines as the biology phenomena of photosynthesis that is a part of the same quantum mechanism. Plants are capable of converting light as a form of energy at the level of the cells therefore it is not impossible to imagine that humans are able to transform conscious energy at a cellular level.
- All cells are not equal, the cells have a lifespan and during this span they undertake several processes, they try to dedicate themselves to a specific function — a nervous cell and a muscular cell will have some similarities even though their functions are not same.
- Nervous tissues are regarded as central tissues as they consist of the brain and spinal cord and also the peripheral nerves. It consists of two main kinds of cells, the neurons (nerve cells) and glial cells.

- Muscle tissues are made up of specialized stretched out contractile cells. These cells are able to perform their functions as they develop a tension beside their longitudinal axes.
- The human body contains several kind of epithelial tissue. The cells are organised in form of sheets. The surface of all body parts, externally and internally is covered with the help of epithelial tissue.
- The prominent feature of connective tissues is their extracellular matrix (ECM). These are those parts of tissues that do not form a part of the cells. The body has five main connective tissues, namely blood, bone, loose, dense and cartilage.
- The condition of the connective tissue has a direct impact on the degree of overall health and wellbeing. Healthy tissues will help the body to move smoothly and reduce the strain on the muscles.

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1.7 KEY WORDS

- **Tissues:** Once the cells that are similar to each other club together in order to perform a specific task they are known as tissues.
- **Squamous Epithelium Tissue:** This is a distinct layer of flat cells in touching base with the basal lamina of the epithelium. This kind of epithelium is frequently penetrable and comes about when tiny molecules have to rapidly pass by the membranes with the help of percolation or diffusion.
- **Cuboidal Epithelium Tissue:** This tissue is cube like consisting of a single layer of cells.
- **Columnar Epithelium Tissue:** This is single-layered tissue and it forms the lining of almost every organ of the human body's digestive system.
- **Cartilage:** It is a type of connective tissue which is comparatively firmer than the dense connective tissue. It contains a network of densely populated fibres made up of a jelly-like material within the cells.

1.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on cell necrosis.
2. Which are the two types of nervous tissues and what are their functions?

3. Briefly mention the various types of muscle tissues and their functions in the body.
4. What is ground substance in connective tissue?

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Long Answer Questions

1. What was the philosophy of Yogic practitioners? Explain with special emphasis on Sri Aurobindo.
2. Explain the three types of epithelial tissues, their functions and their classifications.
3. Identify and describe the various types of connective tissue cells.
4. Explain the relationship between yoga and healthy tissues.

1.9 FURTHER READINGS

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UNIT 2 VARIOUS ORGANS

Structure

- 2.0 Introduction
- 2.1 Objectives
- 2.2 Yoga for the Lungs
- 2.3 Yoga for Health of the Kidneys
- 2.4 Yoga for the Muscles
 - 2.4.1 Yoga for the Diaphragm
 - 2.4.2 Yoga for Abdominal Muscles
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- 2.10 Further Readings

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2.0 INTRODUCTION

It sounds simple, but getting the right kind of relaxation can be a life changing activity for your body's organs. Our bodies are all composed differently, and lifestyle choices add to, or take away from, organ efficiency. So, its important to think of the body's various organs as one unit designed to work together. If one organ gets weaker or works too hard, it can strain the entire system. But the more you can support and stabilize the lower body, the more the upper body relaxes, and this in turns relaxes the organs. This helps them detox, repair and function efficiently so you can feel your best every day.

In this unit, you will learn about the various yoga poses for strengthening the different organs of the body.

2.1 OBJECTIVES

After going through this unit, you will be able to:

- Identify appropriate yoga poses for the lungs
- Discuss appropriate yoga poses for the health of kidneys
- Identify yoga poses for strengthening muscles in general, including muscles of abdomen, back, pelvis, gluteal region, thighs, and legs
- Discuss yoga poses appropriate for strengthening bones and joints

2.2 YOGA FOR THE LUNGS

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Yoga involves exercises which are not high-impact. Even patients suffering from weak lungs are able to practice them easily. All forms of yoga stress on breathing techniques and this helps the people with weak lung power as they mostly suffer from breathlessness. There are many yogic postures which are especially beneficial for strengthening the muscles of the chest. They mostly involve stretches which help in opening the chest and improving the breathing.

The yoga exercises will be effective if performed regularly. There are several asanas that help in improving the health of the lungs. Some of them are listed below:

- **Trikonasana or Triangle Posture:** The posture helps in stimulating the nervous system and letting the air pass the lungs easily. The main advantage of the posture is that it aids in expanding the cavity of the chest therefore making sure that the lungs are adequately exercised. The exercise helps in strengthening and stretching the muscles of the thighs and stomach. The spine muscles are also worked out by this posture. The posture aids in stretching the ligaments of the pelvic area as well. Practice of the trikonasana is not only beneficial for the health of the lungs but also other parts of the body.
- **Gomukhasana or Cow's Face Posture:** The exercise improves the health of the lungs as it involves a breathing technique that opens the chest, thus aiding in easy breathing. The posture helps in improving the overall energy levels of the body as it relieves tiredness and anxiety.
- **Naukasana or Boat Posture:** This posture helps in expanding the chest muscles as it promotes deep breathing. The health of the lungs is bound to improve with regular practice of this posture as their breathing capacity will be eased and enhanced. The posture provides relaxation to other parts of the body as well, it activates the digestive system, circulatory system, nervous system, hormonal system and most of the muscles of the body.
- **Shashankasana or Hare Posture:** This posture improves the breathing capacity of the lungs along with providing strength to the muscles of the neck and shoulders. The posture helps in relieving stress caused due to deep breathing on the lungs.
- **Bhujangasana or Cobra Posture:** This posture is known for benefiting people suffering from asthma. In this the chest is stretched well so that it opens up. Regularly performing this yogic posture helps in improving the health of the lungs.

- **Matsyasana or Fish Posture:** The posture helps the respiratory system by distributing oxygen throughout the body. The posture balances the system by reducing the stress in the body which leads to easy breathing and low anxiety levels.
- **Padma Sarvangasana or Lotus Shoulder Stand:** The posture helps in controlling the flow of blood to the lungs. It is ideal for improving the lung power as it promotes supply of oxygen to the lungs. The posture helps in improving the quality of the breathing as well. The asana is known for its blood purifying qualities also.
- **Ardha Matsyendrasana or The Sitting Half Spinal Twist:** The posture provides a good stretch to the spine thereby activating the body's glands. The practice helps in strengthening the immune system of the body. The asana involves taking deep breaths using the stomach muscles this helps in strengthening the lungs and the entire respiratory system.

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2.3 YOGA FOR HEALTH OF THE KIDNEYS

The kidneys are one of the most essential organs of the body and their malfunction has grave consequences for the body. The malfunctioning of the kidneys is known as chronic kidney disease (CKD). Common causes of CKD are diabetes, high blood pressure and glomerulo-nephritis. Several latest researches have established that the treatment of CKD is hampered by oxidative stress, continuing infection and psychological stress with CKD. Yoga is one of the oldest sciences which have proven time and again that practicing its various forms such as asanas, pranayama, meditations and relaxation practices helps in reducing blood pressure, heart rate, rate of respiration, oxidative stress, mental stress and conditions of inflammation. The practice of yoga also helps in improving the heart rate variability as it brings balance to the autonomic nervous system. Yoga is helpful as it reduces the sympathetic tone and increases the parasympathetic activity. Many researches have established that yoga is an alternative treatment for curing ailments such as diabetes, high blood pressure, chronic heart diseases etc. With regular practice of yoga, the blood sugar levels and blood pressure can be controlled thus indirectly yoga helps in managing and to some extent curing CKD.

Practice of yoga involves several asanas (poses), pranayama (breathing techniques) and meditation. All forms help in relaxing the body internally as well as externally. Today yoga is no longer regarded as a part of religious practice or path for spiritualism; it has become a scientific practice. Yoga supports that individual's existence has five dimensions and only one of them is physical. The five dimensions of yoga comprise of annamaya kosha the physical body, pranamaya kosha the vital body, manomayakosha the mental body, vijanamayakosha the rational body

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and lastly anandamayakosha the causal body. As per the philosophy of yoga the common cause for non-communicable diseases is imbalanced dimensions of the body. For that reason, the focus of yogic practices is to remove the imbalance in these dimensions. The asanas of yoga help in balancing the physical aspects, the vital energy is improved with the help of pranayama and the mental and the intellectual levels are taken care by meditation. Its components such as asanas work at physical level, pranayama works at vital energy level and meditation works at psychological and intellectual levels. In recent past practice of yoga has proven to be beneficial in reducing heart rate, blood pressure and basal metabolic rate as it lower the sympathetic activity. It has been useful for patients suffering from hypertension, diabetes and cancer.

According to a recent study it was established that practicing Hatha yoga helped in improving the levels of anti-oxidants and reducing the oxidative stress in patients suffering from diabetes. According to a study of patients suffering from CKD it was realised that just by practicing hatha yoga for thirty minutes regularly for four months there was a significant drop in oxidative stress and levels of anti-oxidant activity increased. In another study it was realised that yoga helped in reducing the levels of cholesterol for patients suffering from last stage kidney disorder. Yoga helps in improving the levels of haemoglobin in patients suffering from anaemia. It is known to improve the percentage of haemoglobin in patients of CKD. Meditation is known to reduce the arterial blood pressure for CKD.

There are a number of yogic postures for patients of CKD. It has been established in several recent studies that practicing these postures for forty-five minutes every day has acted as an alternative therapy in the treatment.

- The asanas that have to be performed in a standing position are Urdhva-Hastasana, Ardha chakrasana, and Ardha Kati Chakrasana.
- The asanas to be performed while sitting down are Purvottanasana, Shashankasana, Bharadvajasana, and Tittaliasana
- The asanas to be performed while being flat on one's back are Supta Baddhakonasana, Supta Svastikasana, Setubandhasana, Salamba Sarvangasana, ViparitaKarani, pavanmuktasana, and Savasana
- There are several techniques of Pranayama that help in improving the health of the kidneys. Some of these are, tiger breathing, alternate nostril breathing or Nadisuddhi, left nostril breathing or Chandra Anuloma Viloma, humming bee breath or Bhramari, cooling pranayama or Sitali and deep breathing through the stomach while lying down.
- The forms of meditation that are helpful are as follows, mindfulness meditation, Om Meditation and cyclic meditation.

The list of yogic forms to be practiced is endless and regular practice of few of them is bound to improve the health of the kidney. However, there are few

yogic postures that have to be completely avoided by patients of CKD. The asanas that involve an inverted posture such as the sirasana, quick breathing followed during the practice of kapalabhati and bhasrika. These should not be practiced as they escalate the sympathetic activity and increase blood pressure. Along with these postures even the cleansing procedure in yoga such as the laghushankhapraskhalana and vaman dhauti have to be curtailed as their performance creates an imbalance in electrolytes thus overworking the kidneys.

Yoga is considered as a healing intervention which improves the physical as well as the mental health without hampering the other treatment procedures. The practice helps in reducing the symptoms that cause functioning of the kidneys thus safeguarding the health of the kidneys.

Check Your Progress

1. How does yoga help the lungs?
2. What is the other name for fish posture? What are its benefits?
3. Which are the common causes of CKD?
4. Which are the five dimensions of yoga?

2.4 YOGA FOR THE MUSCLES

Regular practice of yoga not only helps in relaxing the muscles of the body but at the same time it also helps in building strong muscles and getting rid of unwanted fat from the body. The muscular health of the body is enhanced due to the fat burning and accumulation of lean muscles. There is overall toning of the body.

The complex functioning machinery of a man's body is made up of approximately seven hundred muscles structured for the vigorous movements of the body parts internally as well as externally. The muscular health of the body is very essential for overall wellbeing and efficient functioning of the body. Yoga has been recommended by doctors and fitness professionals in order to improve the muscle strength of the body.

The yogic science uses the various postures of yoga in order to stretch and develop the muscles. Functioning of all routine movements like walking, bending, lifting etc. requires muscle strength. The practice of yoga is helpful for strengthening the muscular system as it focuses on isometric and eccentric contractions of the muscles.

There are several yoga postures that help in improving muscular health of the body, some of them are listed as follows:

- **Utkatasana:** The asana involves posture of being seated on a chair for this reason it is referred to as chair pose as well. This posture helps in

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strengthening the leg muscles, the hip flexors, quadriceps, glutes, and adductors are contracted for improving their strength. The posture helps in building the strength of the trunk as well since the front body muscles are engaged during its performance.

- **Navasana:** As the name suggest the body is posed in shape of a boat, this helps in strengthening the core muscles of the stomach along with the hip flexors, quadriceps, and spine muscles, erector spinae.
- **Makara Adho Mukha Svanasana:** This posture involves taking a plank position using the forearms. The posture does not focus on any specific muscle rather it helps in toning and stretching the muscles of the spine, stomach, shoulders, legs including the calves and thigh, the posture help the chest muscles as well.
- **Setu-Bandhasana:** This posture is often referred as the bridge pose. The practice helps in strengthening the hips, glutes, and hamstrings muscles. The core muscles are also engaged during the posture. The practice helps in stabilising the spinal muscles as well.
- **Salabhasana:** The asana is also known as locust posture. This posture aims at the muscles of the posterior these include the hamstrings, spine and glute muscles. In addition, the practice helps in opening the muscles of the shoulders and chest.

2.4.1 Yoga for the Diaphragm

Yoga not only helps in creating a well-balanced and healthy lifestyle but it also involves training the individuals to improve their breathing. It involves the practice of breathing techniques that improves the health of the diaphragm. The diaphragmatic breathings are stimulating and relaxing, they help in creating an overall sense of healthiness. They help in calming the nerves of the body and at the same time evade psychosomatic disturbances, such as panic attacks. Yoga helps in improving the ability to focus and concentrate. Breathing is a continuous process and a conscious effort has to be made in order to manage it.

Yoga practitioners master the art of breathing as the training of breath is an integral part of the practice. They have to learn the art of recognising the feelings which occur during diaphragmatic breathing and slowly become used to profound and smooth breathing.

Composition of the Human Breath

Very few people realise that lungs are not muscles. Lungs need help in order to inhale and exhale. It is essential to learn the correct usage of muscles while inhaling so that the lungs are able to take air inside them. The muscles in the neck and upper torso are not helpful in pulling air for the lungs, only people suffering from

emphysema would make use of the muscles; this form of breathing is referred to as clavicular breathing.

Twenty percent of the normal breathing is taken care by the intercostal muscles located between the ribs. Since they surround the lungs it would be natural to breathe through them. After extensive workout most people breathe through their mouth and simultaneously chest begins to heave. This does not happen in a rested state, only the ribs rise and fall while taking air in and outbreath. Chest muscles are not meant for regular breathing as in the long run it would put too much strain on them. The muscles that should be actually used for breathing are located in the diaphragm. The dome shaped muscle lying horizontal to the inner torso is the diaphragm; it is divided into two different sections, the chest cavity and the pelvic cavity. The lungs and the heart are inside the chest; and the other section has the body organs of digestion, absorption, removal, and reproduction.

Contraction of the muscle fibres of the diaphragm help in pulling the upper part of the diaphragm down. This leads to two things, there is expansion of the lungs due to the air and secondly the organs in the abdomen compress downward. While exhaling, the mechanism is totally different. In this the relaxation of the diaphragm's muscle fibres makes the lungs shrink and the air leaves the lungs. Body is relaxed when it exhales. Yoga helps in training the body to grasp this mechanism well and improve the quality of the breathing.

There are many yoga postures that help in diaphragmatic breathing

- Crocodile Posture helps in releasing the breath flow out of the body and use the correct muscles for breathing.
- Shavasana is another helpful posture for diaphragmatic breathing. This is also referred to as the relaxation posture.
- Sitting in an erect posture also helps in diaphragmatic breathing.

Yoga helps in maintaining the equilibrium in otherwise situations of anxiety and panic. The body is able to cope with stressful situations and behave in a composed manner.

2.4.2 Yoga for Abdominal Muscles

Practicing yoga regularly not only relaxes the body and harmonises the activities of the mind and the body but at the same time it helps in developing a healthy core as well. Yoga has many postures that help in building the muscles of the abdomen and this leads to losing the accumulated fat in the tissues of the abdomen. In recent times, tight and fit abdominal muscles have become a craze. This can be achieved by conditioning the large abdominal muscle known as rectus abdominis. The other muscles in the abdomen are the transversus abdominis. These help in stretching the spine, helps in supporting as well as acts as an accessory muscle for breathing.

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The muscle is wrapped around the lower torso thus providing support to the organs inside and stabilises the torso. In the upper part of the pelvic floor there are other muscles of the abdomen.

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2.4.3 Yoga for Strengthening Back Muscles

Hatha yoga is the most frequently practiced form of yoga. This form of yoga involves many asanas. The asanas are complemented by pranayama. There are groups of asanas meant for targeting specific group of muscles; the aim is to concentrate on the muscle throughout the practice.

There are several postures that help in strengthening the back muscles along with the muscles of the abdomen. The two muscle groups are a significant part of the spine's muscular network and strengthening them helps in maintaining a proper posture as well as healthy movements. Yoga helps in providing strength to these muscles resulting in a strong back.

Yoga combines postures that help in stretching and relaxing the muscles that are load bearing muscles, the tension is reduced in these muscles. It is essential to hold the position of the asanas for a minimum amount of time in order to flex and stretch the muscles. This helps in not only relaxing the muscles but also makes the muscles and joints more flexible.

People prone to lower back pain need to stretch the muscles in the hamstring as this will increase the movement in the pelvic area and reduce the strain on the lower back. Moreover, yoga helps in increasing the blood flow in the body and flushes the toxins out of the body. These actions help in keeping the muscles and tissues of the body healthy. It is essential to practice the yoga posture with the correct breathing technique for optimum results.

Yoga helps in providing balance and alignment, helping the body to be healthy and flexible. Regular practice helps in improving the stature of the body, keeping the head, shoulder and pelvis properly aligned. This alignment helps in maintaining the spine's natural curvature and results in a strong back.

2.4.4 Yoga for Pelvic Muscles

The action of walking requires coordination of all the muscles of the leg as well as the pelvic region. People do not skilfully utilise the muscles of the pelvic area as a result these remain ungainly and under-used. Yoga helps in engaging the core muscles and help in improving the movement. The harms of not strengthening the pelvis muscles are realised by people only after they are in their mid-forties but by then it is too late.

The pelvic floor muscles are a very important group of muscles and it is important to strengthen the muscle group. Weak pelvic floor muscle will result in losing control over the bladder and bowel movement. It can also result in lessening

the sexual potentialities. It is essential to use the muscle frequently so that it continues to remain healthy and strong. The muscle tends to become weak in women post pregnancy and conscious effort is required to build its strength. The muscle is also weak in people who frequently complain of constipation and have weight issues.

Yoga helps in developing a routine for strengthening the pelvis muscles. Practicing asanas like Makarasana (crocodile pose) and indulging in diaphragmatic breathing will help in making the muscle strong. The pelvic muscles are connected with the root chakra of the body, and yoga helps in providing internal strength which benefits the muscles as well as the first chakra of the body.

2.4.5 Yoga for Strong Glute Muscles

In order to practice yoga effectively it is important to first build the strength of the glute muscle. Glute muscles are composed of three layers, namely the gluteus maximus, medius, and minimus. There are several asanas in the yoga practice that help in strengthening these muscles.

Developing glute muscles not only helps in a smarter appearance but they are also helpful in supporting the muscles of the spine and pelvis therefore is very essential for the movement of the body. The muscles help in stabilizing the femur of the hip socket and provide internal and external rotation of the leg. It will not be wrong to say that these muscles help in supporting all movements of the body such as walking, standing and even sitting.

The sedentary lifestyle of people leads to a condition called gluteal amnesia, this name has been given by experts as they feel the underuse of the muscles forces them into a state of inactivity. The inactiveness of the muscles results in overstretching of the muscles in the hip. But caution has to be maintained as overworking the muscle also harms the body. There are many yogic asanas that help in strengthening the glute muscles; these are warrior pose also known as the wheel pose, Ardha navasana also known as half boat pose, stretched hand-to-big-toe pose, side plank, chair pose, Malasana, loctus pose, etc.

2.4.6 Yoga for Strong Thigh Muscles

In human structure, the area between the pelvis and the knee is referred as the thigh. It forms the lower limbs of the body. Femur is the only bone in the thigh. The present day's sedentary way of life results in complete lack of exercise, which leads to not only making the muscles in the thigh weak but there is accumulation of excessive fat in the region as well. Yoga practice helps in not only activating the muscles of the thigh but also tones them to a better shape. The asanas enhance the health and the appearance of the thigh muscles.

There are a number of asanas that specifically target the thigh and leg muscles such as Utkatasana, Virabhadrasana II, Natarajasana, Ustrasana, Upavistha

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Konasana, Janu Sirsasana, Baddha Konasana, Malasana, Navasana, Salabhasana, etc.

All these postures help in stimulating the muscles in the hips and the thigh region. They exert the muscles in order to develop their strength. Virabhadrasana specifically targets the muscles in the inner thigh; these muscles are not frequently used in our routine activities. The asanas not only provide strength but they develop them to move gracefully and enhance the overall appearance of people. The asanas help in improving the blood circulation in the lower limbs of the body. The muscles are conditioned and stimulated for providing energy to perform the routine activities.

2.4.7 Yoga for Strong Leg Muscles

Practice of yoga is no longer considered only as a means of attaining mental peace. The practice also helps in providing flexibility, strength and power to all the parts of the body, internally as well as externally. Yoga helps in developing and toning all the muscles of the legs, there are several standing and sitting postures that even target the quadriceps, hamstrings, and calves individually.

The practice utilises the body weight as resistance in order to strengthen and tone up the muscles along with the joints. In standing postures, the weight is divided between both the feet and leg muscles. This helps in keeping the posture upright and increases the stability. The posture helps in developing the muscular strength as well prevents injury. The coordination of the entire body is improved by yoga. Some of the postures that help in building the muscular power of the legs include, Utkatasana, Anjaneyasana, Virabhadrasana I and II, Utkata Konasana, etc.

2.5 YOGA FOR STRONG BONES

Bones of the body are tissues that are alive and as a result they are continuously breaking down and building up. Healthy body is able to balance the breakup and built up optimally. There is fast deterioration when adequate care is not taken for maintaining the bone health, this condition is referred to as osteoporosis. The stage is inevitable during old age but practice of yoga and maintaining a healthy lifestyle helps in delaying this stage as far as possible. There are several yoga postures developed specifically for strengthening the bones of the body. Regular practice will help the bones to be strong. One of the easiest yoga postures for strong bones is Trikonasana also known as the stretched triangle pose, the posture not only increase the flexibility but also helps on relieving gas. The posture provided a gentle stretch for the entire body. Setu Bandha Sarvangasana also known as bridge pose helps in therapy of osteoporosis. Ardha Matsyendrâsana involves sitting down and twisting to one side, in this pressure is exerted on the spine

promoting strong bones and development of new healthy bones. Some of the other postures helping the bone health are Parivrtta Trikonasana, Utthita Parsvakonasana, Salabhasana, Vriksasana or the tree pose is amongst the most popular asanas for promoting health of the bones.

2.5.1 Yoga for Strong Joints

The point where two bones meet is referred as a joint. Yoga helps in providing strength to the movable joints of the body. There are few joint in the body that are immovable such as the joints joining the bones in the skull or the pelvic regions bones. The joints are composed of bones, tendons, ligaments, cartilages and liquid substance known as synovial fluid. The fluid helps in keeping the joints lubricated in order to avoid friction.

Joint health can be enhanced with regular practice of yoga for the following reasons:

- Yoga helps in increasing the mobility range of the body.
- It helps in strengthening the muscles supporting the joints.
- Yoga helps in developing strong bones
- The joint cartilage remains healthy with regular practice of yoga.
- Helps in the circulation of synovial fluid in the joints that are moveable

Check Your Progress

5. What is clavicular breathing?
6. How does regular yoga of practice help the back muscles of a person?
7. Which are the three layers of glute muscles?
8. What is osteoporosis?

2.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. All forms of yoga stress on breathing techniques and this helps the people with weak lung power as they mostly suffer from breathlessness. There are many yogic postures which are especially beneficial for strengthening the muscles of the chest.
2. Fish Posture is also known as Matsyasana. The posture helps the respiratory system by distributing oxygen throughout the body. The posture balances the system by reducing the stress in the body which leads to easy breathing and low anxiety levels.

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3. Common causes of CKD are diabetes, high blood pressure and glomerulonephritis.
4. The five dimensions of yoga comprise of annamaya kosha, the physical body, pranamaya kosha, the vital body, manomayakosha the mental body, vijanamayakosha the rational body and lastly anandamayakosha the causal body.
5. The muscles in the neck and upper torso are not helpful in pulling air for the lungs, only people suffering from emphysema would make use of the muscles; this form of breathing is referred to as clavicular breathing.
6. Yoga helps in providing balance and alignment, helping the body to be healthy and flexible. Regular practice helps in improving the stature of the body, keeping the head, shoulder and pelvis properly aligned. This alignment helps in maintaining the spine's natural curvature and results in a strong back.
7. Glute muscles are composed of three layers, namely the gluteus maximus, medius, and minimus.
8. Bones of the body are tissues that are alive and as a result they are continuously breaking down and building up. Healthy body is able to balance the breakup and built up optimally. There is fast deterioration when adequate care is not taken for maintaining the bone health, this condition is referred to as osteoporosis.

2.7 SUMMARY

- Yoga involves exercises which are not high-impact. Even patients suffering from weak lungs are able to practice them easily. All forms of yoga stress on breathing techniques and this helps the people with weak lung power as they mostly suffer from breathlessness.
- Several latest researches have established that the treatment of CKD is hampered by oxidative stress, continuing infection and psychological stress with CKD. Yoga is one of the oldest sciences which have proven time and again that practicing its various forms such as asanas, pranayama, meditations and relaxation practices helps in reducing blood pressure, heart rate, rate of respiration, oxidative stress, mental stress and conditions of inflammation.
- Regular practice of yoga not only helps in relaxing the muscles of the body but at the same time it also helps in building strong muscles and getting rid of unwanted fat from the body. The muscular health of the body is enhanced due to the fat burning and accumulation of lean muscles. There is overall toning of the body.

- Yoga has many postures that help in building the muscles of the abdomen and this leads to losing the accumulated fat in the tissues of the abdomen. In recent times, tight and fit abdominal muscles have become a craze. This can be achieved by conditioning the large abdominal muscle known as rectus abdominis.
- There are several postures that help in strengthening the back muscles along with the muscles of the abdomen. The two muscle groups are a significant part of the spine's muscular network and strengthening them helps in maintaining a proper posture as well as healthy movements. Yoga helps in providing strength to these muscles resulting in a strong back.
- The action of walking requires coordination of all the muscles of the leg as well as the pelvic region. People do not skilfully utilise the muscles of the pelvic area as a result these remain ungainly and under-used. Yoga helps in engaging the core muscles and help in improving the movement.
- In order to practice yoga effectively it is important to first build the strength of the glute muscle. Glute muscles are composed of three layers, namely the gluteus maximus, medius, and minimus. There are several asanas in the yoga practice that help in strengthening these muscles.
- Yoga helps in developing and toning all the muscles of the legs, there are several standing and sitting postures that even target the quadriceps, hamstrings, and calves individually.

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2.8 KEY WORDS

- **Chronic Kidney Disease:** The malfunctioning of the kidneys is known as Chronic Kidney Disease (CKD).
- **Synovial fluid:** This fluid helps in keeping the joints lubricated in order to avoid friction.

2.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. How is the utkatasana performed?
2. Identify the yoga postures that help in better diaphragmic breathing.
3. How does yoga help to strengthen the pelvic muscles?
4. Name the various asanas that target the leg and thigh muscles.

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Long Answer Questions

1. Explain the various yoga asanas useful for strengthening lung functioning.
2. How does yoga help in better functioning of the kidneys? Illustrate your answer with examples of yoga asanas used for strengthening the kidney function.
3. Explain how yoga helps to strengthen the functioning of bones and joints.

2.10 FURTHER READINGS

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UNIT 3 EFFECTS OF YOGA ON VARIOUS BODY SYSTEMS

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Structure

- 3.0 Introduction
- 3.1 Objectives
- 3.2 Effect of Yoga on the Skin
- 3.3 Effect of Yoga on the Digestive System
- 3.4 Effect of Yogasanas on Nervous System
- 3.5 Effects of Yogasanas on Endocrine System
- 3.6 Effect of Yogasanas on Renal System
- 3.7 Effect of Yogasanas on Sensory System
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3.0 INTRODUCTION

Yoga is one of the few disciplines that focus on the whole being, the entire individual, mentally, physically and spiritually. The practice of yoga is about integration of all the aspects of oneself. Even though the practice of yoga is so much broader than simply physical, when practiced with precision, including the precise motion of the body, breath control and mental discipline, the physical response to the practice is remarkable.

In this unit, you will understand how the practice of yoga benefits the various internal systems of the body.

3.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the effect of yoga on skin
- Explain the effect of yogasanas on digestive system
- Identify the effect of yoga on nervous system
- Examine the effect of yogasanas on endocrine system
- Highlight the effect of yogasanas on renal system
- Recognize the effect of yogasanas on sensory system

3.2 EFFECT OF YOGA ON THE SKIN

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Most yoga practitioners believe that practicing yoga ensures health of mind and body, and this overall wellbeing leads to glowing skin. The practice strengthens the internal system and enhances the external appearance of people by making them look younger.

The asanas in yogic practice are known to increase the circulation of blood and reducing the toxins of the body. This ultimately helps in making the skin glow. Some of the postures that ensure glowing skin include cobra posture, fish posture, triangle posture, child posture etc. The postures of yoga that involve an inverted pose and bending forward will help in enhancing the supply of blood to the head, this leads to benefiting the skin as well.

The practice of pranayama helps in cooling the body and helps people suffering from the problem of acne. Breathing exercises like sheetali and sheetkari, also known as hissing breathing, help to cool down the body and ventilate the skin.

Most skin issues are related to weak digestive system; practice of yoga helps in digestion and improves the functioning of the system, keeping the skin healthy. Practice of Kapal Bhaati helps in detoxifying the body and the effect of the detoxification are most visible on the skin.

Meditation is another way to improve the skin quality, the internal peace reflects on the outer appearance. Yoga helps in tightening the skin, especially the muscles of the face, the smile and kiss exercise helps in getting rid of double chin and tones the skin around the cheek area of the face.

Yoga is very beneficial for the skin. There are a number of factors which encourage people to practice yoga:

- Yoga enhances the circulation of blood in the nerves under the skin, thus helping in renewing the skin cells.
- Yoga helps in flushing the toxins from the body. As stated earlier, most skin issues are related to toxins present in the body by removing them the skin is able to retain its health. The problem of acne, dull skin, frequent rash are some of the issues related to toxins in the body. Yoga cleanses the body of the toxins by increasing the blood circulation.
- Increase in level of oxygen helps to improve the health of the skin. Yoga postures helps in expanding the lungs and they are able to breathe better this results in reducing the carbon dioxide levels in the body. The blood rich in oxygen provides the essential nutrients that help in keeping the skin healthy.
- Practicing yoga helps in improving the digestion of the body. The skin gets its nourishment from the food that is digested in the body, the efficient functioning results in adequate supply of the nutrients to the skin.

- Yoga helps in reducing the stress levels in the body that often are considered a cause of wrinkles appearing in young age. The practice is known for helping in getting better sleep. The rested body is sure to have a healthy skin.
- Yoga helps in regulating the hormones of the body. The balance of hormones not only prevents people from several disorders and weight gain but also helps in keeping the skin healthy. The skin is more prone to breakouts and acne when the hormonal balance of the body is disturbed. There are many postures in yoga which help in stimulating hormone developing glands and provide natural balance to these hormones.
- Yoga acts as a cleaner of mind and pent up emotions. It cures people of depression and helps in positive thoughts. Stress and depression lead to negative thoughts this increases the level of cortisol in the blood and causes pigmentation of skin, blemishes and acne.

Yoga develops the complete personality of an individual in a harmonious manner. The holistic approach of yoga helps both body and mind to coordinate with each other, and promotes overall wellbeing.

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3.3 EFFECT OF YOGA ON THE DIGESTIVE SYSTEM

The digestive system helps in ingestion, digestion, absorption, and defecation. The digestion of the body improves with regular practice of yoga. The increase in blood circulation and efficient functioning of the muscles helps in speedy digestion. With age the digestion system tends to function with lesser efficiency, asanas of yoga keep the system functioning effectively as during the practice the muscles of the digestive system are massaged and the stomach is elevated. The contracting and stretching action stimulates the digestion process.

Digestive disorders that occur frequently are constipation, diarrhoea, bloating because of gas, acidity, GERD, indigestion, colitis, irritable bowel syndrome etc. The main cause of most digestive issues is improper diet, lack of exercise, stress or allergy to certain food items.

Practice of regular yoga asanas help in providing relief from stomach related problems. Increasing the strength of the muscles in the system helps in effective function. It improves digestion. The asanas involve stretching of the organs in the digestive system and this helps in creating space in the system, releases the blockage amid the organs, and improves the flow of blood.

Practice of pranayama also helps in digestion. The correct technique of breathing helps in providing relief from digestive ailments such as abdominal ache, acidity and even bloating.

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Digestive system is unable to function efficiently when there is lack of exercise, improper diet and increased level of stress. Yoga acts as a massage for the internal lining of the digestive tract. Yoga helps in providing the adequate supply of blood and the oxygen to the system thus ensures its smooth functioning. Yoga helps in strengthening the muscular health of the digestive system. It also activates the metabolic processes; the organs and tissue of the system are saved from stagnation because of this activation. Yogasanas help in secretion of necessary enzymes essential for digestion. The practice encourages intestinal peristalsis, excretion etc.

There are many asanas that help in the digestive functioning of the system, these include:

- Asanas like Parivrtta Trikonasana, Marichyasana are for twisting
- Asanas like Setu Bandha Sarvangasana, Adho Mukha Svanasana, Utkatasana are for stretching.
- Asanas like Paschimottanasana, Balasana, Uttanasana, Apanasana are for compressing

As stated earlier, yoga helps in relieving stress and normal functioning of the nervous system. All human activity is regulated through its nervous system. Problem in the nervous system has a direct impact on digestive process. Yoga has a calming effect on the nerves and indirectly on efficient digestive system.

3.4 EFFECT OF YOGASANAS ON NERVOUS SYSTEM

Yoga has been known to increase the clarity of mind and provide peace to the mind. There are many researches that have established the effectiveness of yogasanas on the nervous system. They help in strengthening and balancing the mental state of the individual.

Functioning of the Nervous System

There are two parts in the central nervous system, the sympathetic nervous system and the parasympathetic nervous system. The sympathetic nervous system is accountable for the reactions to the unexpected commotion in daily routine and the parasympathetic nervous system is accountable for the natural functions like breathing, heart and metabolic rates, and restoring balance. When this part of the central nervous system gets activated, the blood flow is channelized towards the digestive organs, endocrine glands and lymphatic circulation. During this time the blood pressure and heart rate are lower than normal.

When the sympathetic nervous system functions there is an increased production of the cortisol hormone. The increase in the level of cortisol is not good for the brain. There is a pressing need to constantly lessen the level of the hormone and stimulate the parasympathetic nervous system. Balance is most essential for creating a strong central nervous system.

Yoga helps in reducing the stress in the body thus reducing the levels of cortisol and preventing its production. The practice helps in preventing the sympathetic nervous system from getting over-worked. Yoga manages to do so as it increases the coordination between mind and the body. This is achieved with combined practice of asanas, breathing and meditation.

Mindful breathing and sensible implementation of yoga postures truly supports nerve communications between the brain and the rest of the body and it also helps in reducing the stress and muscle tension. Totally sustained, recuperative yoga postures stimulate the parasympathetic nervous system, letting out nervousness, panic and rage from the mind. According to a research conducted by Swami Vivekananda Yoga Research Foundation in India, the most effectual recipe for supporting the nervous system is through the regular practice of yogic postures that help in relaxing the muscles along with breathing techniques. It has to be an amalgamation of the two for optimum results.

The mental as well as the physical health of individuals is dependent on the performance of the nervous system. The system is also responsible for regulating the secretory glands. Ancient practitioners of yoga developed the theory of nerve-impulse transmission. In present day this theory is supported by several medical practitioners as well, they have realised that magnetic currents, both negative and positive are merely the impulses of the nerves. All these are easily controllable by practice of yoga. Asanas are able to provide comfort to the nervous system as they improve the circulation of blood, reduce the tension in the muscles and breathing helps in maintaining focus on the mind. In the long-run regular practice of yoga helps in reducing stress and levels of anxiety in the body, the mind is trained to remain calm even during panicky situations and there is attainment of overall well-being. The posture of headstand helps in increasing the blood circulation of the brain this leads to stimulation of the cells in the nerves. The outcome is in form of enhanced brain functioning and amplified vigour.

There are several yoga postures that help in achieving all of the above, these include Viparita Karani, Sarvangasana, Halasana also known as plough pose, Adho Mukha Svanasana, Supta Virasana, this resembles a reclining hero pose, Supta Padangusthasana, Supta Baddha Konasana, Balasana commonly known as child pose, Ananda Balasana, Dhrdasana, Nispanda Bhava Observation), Shavasana commonly known as sleeping pose or relaxation pose.

Check Your Progress

1. Name some yoga poses that contribute to glowing skin.
2. How do yogasanas help relieve stomach problems?
3. How does yoga help in alleviating stress?

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3.5 EFFECTS OF YOGASANAS ON ENDOCRINE SYSTEM

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Yoga has an impact on every organ of the body. This also includes the endocrine system. People face several hormone related disorders in present times and major factor for this is faulty lifestyle and eating habits.

Imbalance of the thyroid gland is one of the most common imbalances. The others include increased levels of cortisol, deficiency of insulin, premature puberty and menopause.

Collection of all the glands releasing the chemicals referred to as hormones is known as the endocrine system. The hormones are supplied into the circulatory system so that they can be delivered to the designated cells. The efficient function of the system is very essential for the body as this helps in maintaining the balance of all the hormones. These hormones are responsible for metabolic growth, development of sexual organs, mental growth, balance of minerals in the body, regulates the heart rate, manages the cycle of sleep, the system is also responsible for the growth of muscle and the skeletal of the body.

The part of brain that controls the endocrine system is called hypothalamus. This control is maintained with the help of pituitary gland. The core of all emotions is also hypothalamus. The entire endocrine system is controlled by the pituitary gland. The other parts of the system include pineal gland, thyroid gland, parathyroid gland, thymus gland, adrenal glands, pancreas, ovaries and testes.

Yogasanas for the Endocrine System

- **Pranayama:** The endocrine system is tremendously benefitted by practicing pranayama. The breathing technique involves training of breath so that it is able to relax and stretch the muscles and body parts. The impact can be felt on the mind and the body. The practice helps in increasing the supply of oxygen to the brain i.e. the hypothalamus also. This improves the function of both the organs, controls the levels of stress and the emotions. Pranayama develops the association among hypothalamus, pituitary and the all the other glands and consequently balancing the endocrine system on the whole.
- **Yog Nidra or Yogic sleep:** Another effective method of controlling levels of stress and emotions is through Yog Nidra. This posture should not be confused with shavasana as this involves remaining completely conscious and the thoughts and senses have to be controlled. The negative thoughts have to be replaced by positive ones. This helps in relaxing and energising the mind as well as the body. This posture not only helps in improving the brain functions but also builds the relationship between all the glands and hypothalamus.

- **Asanas:** There are many postures that help in increasing the flow of blood to the brain, one of them is the Sirsasana. Halasana and shoulder stand helps in improving the working of the thyroid and parathyroid gland. Ardhamatsyendrasana and balasana help in stimulating the pancreas so that the insulin and glucagon can be released from them. Setubandhasana and bhujangasana help in activating the testes and ovaries.

The postures in yoga help in exerting and relieving pressure from few of the glands, this helps in regulating the secretions of the glands. Thus, yoga postures help in stimulating as well as balancing the functions of the endocrine system. Yoga poses stimulate and balance endocrine function.

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3.6 EFFECT OF YOGASANAS ON RENAL SYSTEM

Kidneys are one of the vital organs of the body and require a lot of care to be able to function throughout human life. They help in filtering the waste from the body. The kidneys purify blood as well. The kidneys are needed for working of the urinary system, hormonal secretion, and for maintaining the body's blood pressure. Kidneys perform the task of regulating the levels of acid and bases of the body. This is referred to as homeostasis. In order to perform so many functions they ought to be maintained in optimum health.

Functions of kidney are listed as follows:

- Removal of metabolic waste
- Absorption of vital nutrients
- Maintenance of homeostasis
- Filtration of blood
- Production of hormones

Yogasanas for Healthy Kidneys

Kidney disorders are exceedingly predominant in underdeveloped countries and there are multiple factors responsible for this, few of the common factors are absence of adequate nutrients in the diet, high levels of stress and sedentary lifestyle. According to a survey conducted by WHO over a million people lose their lives due to kidney disorders all over the world. Hypertension and diabetes are regarded as two the most common causes of kidney disorder.

In present times with advancement in medical sciences and technology the doctors are able to treat kidney disorder to a large extent yet even they recommend yoga as an alternate therapy for curing kidney issues at the root level as the practice of yoga effectively manages the main causes, both hypertension and diabetes are controlled by yoga.

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The practice of holistic living has been promoted in form of yoga since the ancient period. The practice aims at healthy way of living with the help of the asanas, meditation, and pranayama. Practice of yoga has no side effects and leads to overall wellbeing.

Yoga postures encourage and relax the organs of the body so that they can function effectively. Regular practice of yoga and maintaining a healthy diet can help in controlling the main causes of kidney diseases.

There are several easy yogasanas that help in improving the health of the kidneys.

- Salamba Bhujangasana also known as sphinx posture, this helps in stretching and strengthening the organs of the abdomen. The asana improves the immune system of the body.
- Ardha Matsyendrasana this involves sitting in a half spinal twisted posture. The asana helps in stimulating the liver and the kidneys. This also helps in improving the immune system of the body.
- Bhujangasana is also known as the cobra pose. It helps in stimulating organs of the abdomen and release stress and tiredness from the body. This helps in boosting the immunity of the body.
- Paschimottanasana the asana is also referred to as two-legged forward bending. The posture helps in maintaining the health of the kidneys as it aids in digestion. The asana is very helpful in relieving pain during menstruation.
- Setu Bandhasana or bridge pose helps in stimulating the organs of the abdomen. The asana is effective in controlling the blood pressure and reducing the stress levels of the body.
- Naukasana or the boat pose is practiced in order to strengthen and stimulate the organs of the abdomen. The asana helps in improving digestion and reducing the stress of the body.

Benefits of Yoga for the Kidney

Practicing yoga is helpful in relaxing the body. Yoga helps in treating water retention in the body. The relaxed body is able to sleep better. A number of disorders are caused due to a sleep deprived state; hence sleeping better will help in all organs of the body to function effectively. The blood circulation and the heartbeat will be regulated. Yoga helps in maintaining the health of the internal organs of the body; the practice encourages a balance between all the systems and also controls the stress levels and relaxes the mind. There are few yogic asanas specifically for cleansing and removing the toxins present in the body. Both mind and body are refreshed after the yogic cleansing.

Kidney health will be further improved with consumption of a balanced and nourishing diet. Patients of kidney disease need to keep a watch on the potassium levels of the body. They should avoid food rich in potassium and instead have an iron-rich diet. The water intake of the body should also be increased and body should have adequate sleep so that it is able to function smoothly and remain stress free.

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3.7 EFFECT OF YOGASANAS ON SENSORY SYSTEM

The sensory system comprises of sensory receptors, neural pathways, and portions of the brain helpful in sensory perception. The normally acknowledged sensory systems include vision, hearing, somatic sensation (touch), taste and olfaction (smell).

Appropriate organisation of sensory signals is essential for responding in the correct manner. People who are unable to organise these signals are said to be suffering from a sensory processing disorder (SPD). They are known to demonstrate awkwardness, reduced motor skills and other types of behaviour problems due to their inability to organise the signals.

The sensory systems include usually the vestibular or movement of the body, proprioception is being aware about the body and tactile is to react to touch. When individuals have problems in these areas, they exhibit weak balance and coordination in their actions. They are not able to react in the appropriate manner and their actions and reactions do not tally with the situation.

- The regular practice of yoga helps in not only gaining control on the movements of the body but also regulates their actions. The practice of pranayama teaches them to breathe and remain calm. Yoga helps in relaxing the nerves of the body and improves the functioning of the nervous system. With the help of yogic asana the patients of SPD are able to regulate the vestibular movements and become aware of their body. They begin to realise the sense of touch.
- Yoga helps in soothing the sensory system with the help of breathing techniques. It encourages the parasympathetic system to become dominant. The muscles are relaxed with the practice of yoga. The practice is known to benefit adults as well as children suffering from SPD.
- Yogic practice improves the awareness of one's body. Individuals receive exceptional proprioceptive and vestibular response with the help of postures of yoga. The poses that involve twisting help in compressing the muscles and help in developing awareness of the body.

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- The posture carried out standing help in developing steadiness, strength, and synchronization. The tree pose, eagle pose and dancer pose help in compressing the joints. The frontal and backward bends help in improving the vestibular system. The postures help in not only increasing the awareness but also help in calming the body actions.
- The breathing awareness helps in controlling and regulating the nervous system. Several experts have recommended the ujjayi breathing and alternate nostril breathing. Breathing practices involved in yoga help in relaxing and soothing the nervous system.
- Practice of yoga helps in increasing awareness about self. This involves physical as well as mental awareness and also control over the breath. Yoga essentially aids in developing a better sense of self, a feeling of belongingness for the world around and sense of acceptance.

Check Your Progress

4. Which part of the brain controls the endocrine system?
5. Which common factors are responsible for kidney disorders?
6. What is the benefit of bhujangasana?
7. What happens to people who do not have normally functioning senses?

3.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Some of the yoga postures that ensure glowing skin include cobra posture, fish posture, triangle posture, child posture etc. The postures of yoga that involve an inverted pose and bending forward will help in enhancing the supply of blood to the head, this leads to benefiting the skin as well.
2. Practice of regular yoga asanas help in providing relief from stomach related problems. Increasing the strength of the muscles in the system helps in effective function. It improves digestion. The asanas involve stretching of the organs in the digestive system and this helps in creating space in the system, releases the blockage amid the organs, and improves the flow of blood.
3. Yoga helps in reducing the stress in the body thus reducing the levels of cortisol and preventing its production. The practice helps in preventing the sympathetic nervous system from getting over-worked. Yoga manages to do so as it increases the coordination between mind and the body. This is achieved with combined practice of asanas, breathing and meditation.
4. The part of brain that controls the endocrine system is called hypothalamus.

5. The common factors responsible for kidney disorders are absence of adequate nutrients in the diet, high levels of stress and sedentary lifestyle.
6. It helps in stimulating organs of the abdomen and release stress and tiredness from the body. This helps in boosting the immunity of the body.
7. Appropriate organization of sensory signals is essential for responding in the correct manner. People who are unable to organise these signals are said to be suffering from a Sensory Processing Disorder (SPD). They are known to demonstrate awkwardness, reduced motor skills and other types of behaviour problems due to their inability to organise the signals.

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3.9 SUMMARY

- Most yoga practitioners believe that practicing yoga ensures health of mind and body, and this overall wellbeing leads to glowing skin. The practice strengthens the internal system and enhances the external appearance of people by making them look younger.
- Meditation is another way to improve the skin quality, the internal peace reflects on the outer appearance. Yoga helps in tightening the skin, especially the muscles of the face, the smile and kiss exercise helps in getting rid of double chin and tones the skin around the cheek area of the face.
- The digestive system helps in ingestion, digestion, absorption, and defecation. The digestion of the body improves with regular practice of yoga. The increase in blood circulation and efficient functioning of the muscles helps in speedy digestion.
- Yoga has been known to increase the clarity of mind and provide peace to the mind. There are many researches that have established the effectiveness of yogasanas on the nervous system. They help in strengthening and balancing the mental state of the individual.
- Collection of all the glands releasing the chemical referred to as hormones is known as the endocrine system. The hormones are supplied into the circulatory system so that they can be delivered to the designated cells. The efficient function of the system is very essential for the body as this helps in maintaining the balance of all the hormones.
- The postures in yoga help in exerting and relieving pressure from few of the glands, this helps in regulating the secretions of the glands. Thus, yoga postures help in stimulating as well as balancing the functions of the endocrine system. Yoga poses stimulate and balance endocrine function.
- In present times with advancement in medical sciences and technology the doctors are able to treat kidney disorder to a large extent yet even they recommend yoga as an alternate therapy for curing kidney issues at the root

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level as the practice of yoga effectively manages the main causes, both hypertension and diabetes are controlled by yoga.

- Practice of yoga helps in increasing awareness about self. This involves physical as well as mental awareness and also control over the breath. Yoga essentially aids in developing a better sense of self, a feeling of belongingness for the world around and sense of acceptance.

3.10 KEY WORDS

- **Homeostasis:** Kidneys perform the task of regulating the levels of acid and bases of the body. This is referred to as homeostasis.
- **Endocrine system:** Collection of all the glands releasing the chemicals referred to as hormones is known as the endocrine system.

3.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Which are some of the stomach ailments that people suffer from and what are the ways in which yoga helps to ease them?
2. Name and define asanas used for boosting the digestive system.
3. How does the endocrine system function and what kind of common imbalances are seen in the functioning of the endocrine system?
4. List the main functions of the kidneys.

Long Answer Questions

1. Discuss the factors which encourage people to practice yoga, with special emphasis on its impact on skin.
2. Explain the functioning of the nervous system and the role of yoga in improving the nervous system.
3. Explain the asanas that can be used to boost the functioning of the renal system.
4. Discuss the benefits of yoga for the sensory system of the human body.

3.12 FURTHER READINGS

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*Effects of Yoga on
Various Body Systems*

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UNIT 4 CHEST CAVITY

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Structure

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Effect of Yoga on the Chest Cavity
- 4.3 Regulation of Breathing
 - 4.3.1 Expiration
- 4.4 Types of Breathing in Yoga
- 4.5 Effect on Respiratory System
- 4.6 Effect of Yoga on Circulatory system
 - 4.6.1 Yoga and Electrocardiogram (ECG)
- 4.7 Answers to Check Your Progress Questions
- 4.8 Summary
- 4.9 Key Words
- 4.10 Self Assessment Questions and Exercises
- 4.11 Further Readings

4.0 INTRODUCTION

Yoga helps in opening up and expanding the chest space of the physical body. The heart is located in the thoracic cavity surrounded by the rib cage; there are twelve ribs on each side. The bone of the breast called sternum is in the front part and in the rear is the spine. There are soft tissues holding the bones together. These tissues hold the small and large muscles and also the cartilage, which is in the vertebrae of the spine. The dome shaped muscle; the diaphragm is between the heart and the lungs, right over the digestive system. It acts as the base of the thoracic cavity.

In this unit, you will learn about the respiratory and circulatory systems and the impact of yoga on them.

4.1 OBJECTIVES

After going through this unit, you will be able to:

- Understand the regulation of breathing and expiration
- Identify the types of breathing in yoga
- Explain the effect of yoga on respiratory system
- Discuss the effect of yoga on circulatory system and heart and other constituents like dorsal aorta, arteries veins, and their functions
- Discuss ECG

4.2 EFFECT OF YOGA ON THE CHEST CAVITY

In a healthy body, the soft tissues backing the rib cage stay strong for the entire life. It easily expands as the breath is inhaled. The rib cage does not act as an obstructive vessel for the heart or the lungs. In case the rib cage becomes rigid the lungs will be unable to expand while taking a deep and long breath; moreover, their rigidity will hamper the flow of blood to the heart as well. Rigid rib cage causes hindrance during the practice of several yogic postures and breathing techniques. The strain can also cause pain in the lower back and the neck region.

The mobility of the chest cage can be improved with the practice of yoga and pranayama. The breathing exercises help in stretching the soft tissues of thoracic portion in a gentle manner. This helps in opening the space of the heart. Each time the individual senses fear through pain or stress they tend to hold their breath or their breathing becomes very erratic, with frequent shallow breaths. The breathing during this time makes the muscles to become tight and prevent the area from opening up. This also grips the upper part of the abdomen and therefore prevents the diaphragm to function naturally.

Yoga helps in training the practitioner to take slow, gentle and deep breaths. It removes the aggression out of the breath. This helps in keeping the muscles soft. The soft muscles will prevent the chest cage from becoming tight and rigid. The impact of soft and gentle breathing will help the abdomen and diaphragm muscles also to function naturally.

Postures of Yoga to Expand the Chest Cavity

It is best to avoid positions that might cause discomfort. The best posture for opening of the chest as well as the stomach would be a slow and smooth backbend performed with the support of a rolled up towel or mat. The support should be kept under the middle of the back, as the ribs are attached at this point. The arms should be open with the palms facing upwards. The posture helps in expanding the front part of the rib cage and top part of the abdomen as the breath is inhaled. The knees remain in a folded position and it is advised to keep a support under the head for people suffering from lumbar and cervical hyperextension.

A slight twist will help in expanding the ribs on the sides as well. The Balasana helps in removing the tightness from the shoulder blades. This helps in opening up the spine as well as relieves neck pain.

It is essential to complement this performance with deep, slow and gentle breathing for optimum results. The correct breathing pattern will help in focusing the mind on the muscle that is being stretched. The deep inhaling action smoothly expands and opens the chest; the exhalation should be done surrendering to gravity so that the muscles are fully relaxed. This practice should be done regularly for best results.

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Breathing exercises also help in releasing the pent up emotions and the body is able to get rid of its stress, depression and frustration. The more the sternum is expanded the chest cage will open up automatically. This will help in increasing the supply of oxygen and blood to the entire body and there will be sense of overall wellbeing.

4.3 REGULATION OF BREATHING

The purpose of pranayama and yogic breathing techniques is to administer control over the breath and make it as gentle and as deep as possible. The breathing should not be forceful. This is not easy to achieve and some practitioners spend their entire life in attaining perfection in this.

It is helpful to consciously breathe more than normal so that it becomes easy to master the technique of breathing. Breathing additional to normal standards is referred to as hyperventilation, however, the aim is to achieve the state of hypoventilation which involves breathing less than normal standards.

Once the breathing is mastered then people can improve the health of many organ systems of the body including cardiovascular, digestive system, functioning of the respiratory muscles, overall physical strength, control over mind, stability of emotions, and in fact, hunger pangs can also be controlled. There will be an increase in the levels of energy as the body's ability to reproduce cells and tissues will be enhanced.

The breathing during the practice of yoga needs to be regulated for physical, neurological, mental, emotional, cardiovascular, digestive, renal, and other physiological reasons. The reasons are explained below:

The art of breathing less than the normal standards can be mastered with the pranayama. This is referred to as hypoventilation.

Physically, there are, following benefits:

- Helps in activating the spine
- Helps in making the spine stable
- Makes the spine and the body strong

Neurologically the regulation of breath helps in controlling the automatic nervous system, as it aids in controlling the diaphragm. The controlled breathing helps in relaxing the muscles of the abdomen that are used during exhaling; this prevents them from getting stressed and reduces occurrence of lower back pain.

Mentally, the regulated breath helps in improving concentration. Moreover, hypoventilation makes the body extra acidic, the increase in the acidic levels slightly helps to calm the nervous system and mind generally.

Emotionally the body benefits from diaphragmatic breathing as it improves the parasympathetic control and leads to relaxation which triggers emotions of love, peace and compassion. Helps in reducing the level of aggression in individuals.

The body's cardiovascular health improves with regulated breathing as the practice of deep breathing helps in relaxing the abdomen muscles to relax along with them the diaphragmatic and thoracic muscles are also relaxed and this increases the flow of blood in the body. This helps in decreasing the blood pressure.

The digestive system of the body also benefits from diaphragmatic inhalations as the increased blood supply helps in fast digestion and the body is able to absorb the vital nutrients required by the body. The regulated breath also helps in better bowel movement.

Reproductive health is also improved as slow abdominal breathing helps in relaxing the muscle and enhanced function of the nervous system, this leads to increasing the performance of the reproductive cycle. Yoga helps in regulating the menstrual cycle of the women. The slow and deep breathing prevents too much pressure on the bladder and aids in releasing of the egg from the fallopian tube thus preventing infertility.

The regulated breath helps the physiological health of the body in the following ways:

- Keeping the nerves calm
- Increasing the level of oxygen and improved blood flow to the brain and the heart
- The air in the lungs is enhanced and this is very beneficial for asthma patients.
- Regulates unwanted urge to eat and helps in weight loss.
- Stimulates the nerves
- Helps in increasing the synovial fluid in the joints

4.3.1 Expiration

Releasing the breath out of the body is referred to as expiration or exhalation. The action involves movement of air present in the airways of the lungs to be released out of the body into the environment by breathing out.

The action takes place due to the elasticity of the lungs and also the inner intercostal muscles that help in lowering the rib cage thus reducing the thoracic volume. Since the thoracic diaphragm eases in outbreath, the makes the depressed tissues to escalate hugely and exert pressure on the lungs so that the air can be expelled. At times when body is forced to expel air, for instance while filling a balloon, the muscles responsible for exhalation, these also include the muscle of the abdomen and the inner intercostal muscles to produce abdominal and thoracic pressure, thus air is forced from the lungs.

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The air exhaled from the body heavily contains carbon dioxide; it is an unwanted produce of cellular respiration when energy is produced. The produced energy is stored as ATP. The cycle of breath of the respiratory system consists of both actions of taking in and exhaling the air. They have a complementing relationship with each other.

Breathing slowly helps in increasing the cardiac-vagal baroreflex sensitivity (BRS), oxygen saturation is improved, helps in lowering the blood pressure, and lessens anxiety. In yogic traditions breathing slowly is mostly clubbed with tightening of the glottis muscles. This breathing with resistance also referred to as “ujjayi” is accomplished at several degrees and proportions of inspiration and expiration.

Ujjayi breathing helps in reducing airflow and at the time of expiration it enhances the intrathoracic pressure. This happens because of the increased vagal activity. With enhancement in expiratory intra-thoracic pressure there is increase in the level of oxygen that is absorbed during slow breathing, there is a possibility that the levels of blood pressure would be higher as compared to when only slow breathing is practiced and this will also induce higher BRS. To sum up, there is better control over the rate of breath during the practice of ujjayi breathing facilitates thus providing better control over airflow. As a result, ujjayi could be a better technique as compared to slow breathing as it only achieves five breaths in sixty seconds against the average human who is normally breathing twelve to eighteen breaths every sixty seconds. Moreover the extra effort used in exhalation might exert intra-thoracic pressure, resulting in stimulation of sympathetic activity, somewhat decreasing the benefits of the technique. There have been teste conducted in order to establish the effectiveness of ujjayi breath in improving saturation of oxygen and BRS as compared to solo practice of slow breathing.

Exhalation during squeezing the front of the body is essential. The movements involving forward bends would result in compressing the frontal part of the body. For instance while performing a forward bend sitting down, the front of the body is contracted and the stretch is felt on the back. Such movements should be performed with exhalation even postures involving side bending and twisting, where the chest and abdomen are not expanded need to be performed starting with exhalation. Inhaling while bending forward or twisting or bending sideways the breath will get compressed and this could harm the body.

Check Your Progress

1. What happens when the rib cage becomes rigid?
2. Which asana helps in removing the tightness from the shoulder blades?
3. How does regulation of breath help in mental state of a person?
4. What is expiration?
5. What is the benefit of ujjayi breathing?

4.4 TYPES OF BREATHING IN YOGA

The bridge between physical body and mind is breath. The basis of all the asanas are based on the breathing style in yoga. The type of breath used in yoga is different from the normal breathing of routine life. Yoga consists of varied types of breathing and each one of them has a technique and effect the body in different manner. There are some which target on providing exergy and power to the posture while other help in relaxation. Breathing helps the mind to realise the body part that is being targeted during the practice. Breathing also helps in focusing on the posture and prevents the thoughts from wandering.

Sanskrit term pranayama is the most commonly used in the practice of yoga; it denotes the style of breathing. “Prana” refers to force of life and “yama” refers to controlling, therefore the word refers to controlling the breath. Yoga involves altering the normal style of breathing. Each posture demands a different pattern of breathing for optimum effectiveness.

Breathing is generally an involuntary action and does not require focus; the nervous system does all the required actions. This is not so while practicing yoga, the focus on breath helps in gaining control over the body as well as the mind. For instance breathing at a fast pace helps in increasing the heart rate, thus provides more energy. The breathing is fast in the beginning of the yogic practice so that the body can be warmed up.

Breathing slowly helps in decreasing the heart rate and provides relaxation to the body. For this reason all yoga practices and workouts are ended with slow breathing so that the heart rate becomes normal and body can relax. During Savasana the breathing is very slow and gentle. Yoga posture and breathing go hand-in-hand and both are essential for maximum benefits of the practice.

- Dirga Pranayama has three parts and is also referred to as complete breath. This type of breathing is used exercises that expand the chest, forward bend postures and postures involving the belly-down. In these postures it is essential to concentrate on the breathing. In this type, air is inhaled through the nose and filled first in the belly then to the chest and lastly to the lower part of the neck. Exhalation is done in reverse order, starting from the neck and ending at the belly. The breathing style helps in relaxing the practitioner and is useful for extra passive flow. It is a good idea to place hands at the respective areas so that a sense of breathing can be felt.
- Ujjayi Pranayama is the second type of breathing used in yoga practice. It is also referred to as warrior’s breath; this form of breathing is powerful and mostly used in practice of vinyasa or Ashtanga. The nose is used to inhale as well as exhale. At the time of exhalation the air should be

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pushed out from the back of the creating a sound of “h” but the lips have to constantly remain closed. The exhalation is forceful and thus helps in stimulating the muscles of the abdomen, for this reason it is applied in practices requiring the warmup the body.

- Initially the breathing form should be practiced for five to ten minutes and then the practitioner may progress up to fifteen minutes per session. The practice can be performed in a sitting pose or even while lying down.
- Bhramari Pranayama is the third type of breathing. It is referred to as “bee breath” since the technique involves creating noise same as the humming of the bee. This can be practiced while sitting or lying down. The breathing form begins by placing the tips of index fingers of both the hands in between the ears and the cheeks or the temples. The fingers should not press the head in case performed in savasana. Nose should be used to inhale and while breathing out humming noise should be created and the index fingers should be pushed in gently. The humming noise helps in relaxation and increase concentration during a yoga practice.
- Kapalabhatti Pranayama is the fourth type of breathing used in yoga. The form is also referred to as the “the skull shining breath.” More focus is on the exhalation, it is forced and short. The air from the stomach needs to be pushed out rapidly so that the muscles are contracted throughout the practice. The inhalation is soft but the exhalation is forceful. Both the actions have to be carried out through the nose. The use of mouth will nullify the impact of the practice. The breathing energies the mind and regular practice helps in not only toning the muscles of the abdomen but also adds a glow on the face and sparkle in the eyes.
- Nadi Shodana Pranayama is the fifth type of breathing used in yoga in order to clear the mind of unnecessary thoughts prior to starting the actual practice. The form helps in preparing the body for a session of meditation. The breath is taken in using only one of the nostrils. The practice is most effective when carried out in a sitting pose with the legs crossed. The index and middle finger of the right hand are used to softly press the forehead and the ring finger and little finger are placed on the left nostril while the thumb’s tip is placed on the nostril on the right. Keeping the left nostril closed with the fingers placed there the right nostril should be used to exhale. The same should be used to breathe in and closed with the thumb so that exhalation can take place from the left nostril. Alteration will be continued for ten breaths and in that way both the nostrils will be used.

4.5 EFFECT ON RESPIRATORY SYSTEM

Hatha Yoga is known to be the most popular form of yoga and for this reason it is practiced most frequently. It involves both asanas and breathing techniques in order to create a balance between the mind and the body. The practice is an amalgamation of both and as a result it is most effective in maintaining the health of the respiratory system of the body. It is crucial to maintain the health of the respiratory system as it has an impact on all the other systems of the body. Hatha yoga has several postures specially meant for the maintenance of the essential system.

Yoga postures involving the movement of spine in all directions clubbed with proper breathing helps in respiratory health. These movements help in stretching and strengthening the muscles in the upper torso of the body. They make the muscles strong and flexible at the same time. The postures are combined with deep inhalation and exhalation or even fast breathing as Kapalabhati. Yoga is known to be beneficial in treating asthma patients by increasing their lung power.

Yoga and Respiratory Health

The asanas not only provide strength and flexibility to the muscles of the respiratory system but they also help in reversing changes occurring due to old age, lifestyle, hurts, and scoliosis. The practice helps in bringing about changes in the structure of the chest muscles and fascia, the regular practice of the asanas has over a period of time helped in altering the bones of the chest wall and thoracic spine.

The practice is able to achieve reversal in following ways:

- The posture is improved as the spinal muscles regain their strength.
- Stretching helps in mobility of chest muscles.
- With the combined practice of asanas and pranayama the flexibility and strength of the muscles in the system is improved.

Yoga not only improves general health but at the same time certain asanas help in targeting specific parts of the body. For instance the rounding of the thoracic spine can be reduced by including back bending poses. Asanas such as Phalankasana (Plank), Side Plank, and Upward Plank etc. can be practiced to strengthen the chest muscles. The front muscles of the chest can be strengthened by practicing Bhujangasana or Urdva Mukha Svanasana regularly.

Yoga helps in increasing the awareness about the correct way of breathing and this helps in relaxing not only the muscles of the chest but also the abdomen. Well-balance breathing during yoga will help in achieving the desired results. The efforts of the practice will show on the body by keeping it calm, relaxed, focused and healthy. The strength and flexibility of the chest muscles will be enhanced and the diaphragm will be properly used in the breathing process. In recent times

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many studies have shown the benefits of practicing pranayama in order to improve the functioning of the lungs and curing chronic obstructive pulmonary disease (COPD).

The practice helps in releasing the load on the respiratory system by giving its organs a chance to relax. The adequate supply of oxygen and blood flow to the lungs helps in smooth and easy functioning of the system thus preventing undue stress on the lungs. Yoga helps in building the immunity of the body and prevents the organs of respiratory system and its tract from catching infections.

Yoga also helps in reducing the anxiety levels of the body. People suffering from chronic respiratory conditions are prone to experiencing continuous anxiety as a result their mind is full of negative thoughts. Breathing issues cause irritation and frequent bouts of panic, yoga trains people to handle these episodes in a composed manner thus improving their overall wellbeing. People can actually develop stress just by worrying about not being able to breathe comfortably, meditation cures people from unnecessary stress as it has a calming effect on the mind and the body.

4.6 EFFECT OF YOGA ON CIRCULATORY SYSTEM

Yoga can be regarded as a full body workout; the impact of these exercises can not only be felt externally but also internally. The feeling of wellbeing is also twofold.

The main parts of the circulatory system are the heart that helps in pumping the blood in and out and the blood vessels that act as the conduits. The contraction of the heart helps in supplying the lungs with blood and from where lungs provide the oxygen. The oxygen rich blood returns to the heart and is then circulated to each and every part of the body and all its cells and tissues receive the blood. The blood after being deprived of its nutrients is returned to the heart to get ready for the same cycle after recouping.

Yoga helps in benefiting the complete circulatory system, starting from production of blood; the blood is produced in the marrow of the thigh bones. The circulation of blood is improved in the legs with regular practice of yoga. The asanas of yogic practice help in stretching the main blood vessels and keep them flexible and blockage free.

Breathing techniques in the practice help in oxygenating the blood and keep up the stock of essential nutrients and these are then supplied to all the peripheral vessels and their capillaries. Enhanced circulation helps the brain to receive adequate supply of oxygen keeping it alert and focused. The body functions smoothly as all the organs receive their essential nutrients.

Yoga helps in managing the stress levels of the body thus keeping the blood pressure normal and body stays free from heart related ailments. Yoga acts as a

relaxing agent for nervous system by keeping the nerves calm and reduces the impact of stress on them.

Yoga is known for curing people of hypertension but very few realise that the practice is exceedingly useful for patients suffering from low blood pressure as well. There are several postures that help in elevating the level of blood pressure in the body.

All asanas in yoga involve holding the muscle tension for a few seconds this practice is very helpful in improving the fitness and circulation levels of the cardiovascular system. Yoga has proven its benefits in controlling the blood pressure and maintaining the normal levels. All postures that involve lifting the stomach help in raising the diaphragm as well this action has a massaging effect on the heart. The heart muscles are relaxed and strengthened. There are several asanas in yoga that promote the health of the circulatory system, some of them are, Shirshasana, Sarvangasana, Viparita karni, hahsana, Mayurasana and breathing techniques of pranayamas also help in improving the blood circulation. Blood pressure is controlled with consistent practice of Shavasana. Yoga has incredible health benefits for the heart. The yoga postures help in flow of blood and calm the nerves. Hatha yoga helps in curing people from hypertension. Yoga in some cases has helped in lowering the cholesterol levels in the body. There are forms of practice such as power yoga which provide a good cardio workout to the body and with all the other benefits helps in quick reduction of weight as well.

4.6.1 Yoga and Electrocardiogram (ECG)

Researchers are able to study the activities of the heart with the help of the ECG. It has been used to study the heart rate of people practicing regular yoga asanas and breathing techniques. The results of these researches showed that yoga helps in lowering the heart rate of people practicing regularly. These people have been able to manage problems related to heart effectively. Yoga has helped to reduce the stress levels and keep the nerves calm.

ECG is also commonly used to measure the efficiency of the functioning of the heart. When ECG's of hypertension patient practicing regular yoga were compared with those not practicing it was clearly visible how effective yoga can be in controlling heart related problems.

Check Your Progress

6. What does the word 'pranayama' mean?
7. What is kapaal bhaati pranayama?
8. What effect does yoga have on ECGs of regular practitioners?

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4.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. In case the rib cage becomes rigid the lungs will be unable to expand while taking a deep and long breath; moreover, their rigidity will hamper the flow of blood to the heart as well. Rigid rib cage causes hindrance during the practice of several yogic postures and breathing techniques. The strain can also cause pain in the lower back and the neck region.
2. The Balasana helps in removing the tightness from the shoulder blades. This helps in opening up the spine as well as relieves neck pain.
3. Mentally, the regulated breath helps in improving concentration. Moreover, hypoventilation makes the body extra acidic, and the increase in the acidic levels slightly helps to calm the nervous system and mind generally.
4. Releasing the breath out of the body is referred to as expiration or exhalation.
5. Ujjayi breathing helps in reducing airflow and at the time of expiration it enhances the intrathoracic pressure. This happens because of the increased vagal activity.
6. Sanskrit term pranayama is the most commonly used in the practice of yoga; it denotes the style of breathing. “Prana” refers to force of life and “yama” refers to controlling, therefore the word refers to controlling the breath.
7. Kapalabhatti Pranayama is the fourth type of breathing used in yoga. The form is also referred to as the “the skull shining breath.” More focus is on the exhalation, it is forced and short. The air from the stomach needs to be pushed out rapidly so that the muscles are contracted throughout the practice.
8. Researchers are able to study the activities of the heart with the help of the ECG. It has been used to study the heart rate of people practicing regular yoga asanas and breathing techniques. The results of these researches showed that yoga helps in lowering the heart rate of people practicing regularly.

4.8 SUMMARY

- The mobility of the chest cage can be improved with the practice of yoga and pranayama. The breathing exercises help in stretching the soft tissues of thoracic portion in a gentle manner. This helps in opening the space of the heart.
- Breathing exercises also help in releasing the pent-up emotions and the body is able to get rid of its stress, depression and frustration. The more the

sternum is expanded the chest cage will open up automatically. This will help in increasing the supply of oxygen and blood to the entire body and there will be sense of overall wellbeing.

- It is helpful to consciously breathe more than normal so that it becomes easy to master the technique of breathing. Breathing additional to normal standards is referred to as hyperventilation, however, the aim is to achieve the state of hypoventilation which involves breathing less than normal standards.
- Releasing the breath out of the body is referred to as expiration or exhalation. The action involves movement of air present in the airways of the lungs to be released out of the body into the environment by breathing out.
- Ujjayi breathing helps in reducing airflow and at the time of expiration it enhances the intrathoracic pressure. This happens because of the increased vagal activity. With enhancement in expiratory intra-thoracic pressure there is increase in the level of oxygen that is absorbed during slow breathing, there is a possibility that the levels of blood pressure would be higher as compared to when only slow breathing is practiced and this will also induce higher BRS.
- The bridge between physical body and mind is breath. The basis of all the asanas are based on the breathing style in yoga. The type of breath used in yoga is different from the normal breathing of routine life. Yoga consists of varied types of breathing and each one of them has a technique and effect the body in different manner.
- Breathing slowly helps in decreasing the heart rate and provides relaxation to the body. For this reason all yoga practices and workouts are ended with slow breathing so that the heart rate becomes normal and body can relax. During Savasana the breathing is very slow and gentle. Yoga posture and breathing go hand-in-hand and both are essential for maximum benefits of the practice.
- Yoga postures involving the movement of spine in all directions clubbed with proper breathing helps in respiratory health. These movements help in stretching and strengthening the muscles in the upper torso of the body. They make the muscles strong and flexible at the same time. The postures are combined with deep inhalation and exhalation or even fast breathing as Kapalabhati.
- Yoga helps in increasing the awareness about the correct way of breathing and this helps in relaxing not only the muscles of the chest but also the abdomen. Well-balance breathing during yoga will help in achieving the desired results. The efforts of the practice will show on the body by keeping it calm, relaxed, focused and healthy.

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- Yoga can be regarded as a full body workout; the impact of these exercises can not only be felt externally but also internally. The feeling of wellbeing is also twofold. The main parts of the circulatory system are the heart that helps in pumping the blood in and out and the blood vessels that act as the conduits.
- All asanas in yoga involve holding the muscle tension for a few seconds this practice is very helpful in improving the fitness and circulation levels of the cardiovascular system. Yoga has proven its benefits in controlling the blood pressure and maintaining the normal levels.

4.9 KEY WORDS

- **Hyperventilation:** It is a condition in which a person starts to breathe very fast.
- **Hypoventilation:** It is a condition in which a person is receiving inadequate ventilation.
- **Pranayama:** “Prana” refers to force of life and “yama” refers to controlling, therefore, the word refers to controlling the breath.

4.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. How does yoga help in increasing the mobility of the chest cavity?
2. What are the physiological benefits of regulation of breath?
3. Why is there special emphasis on conscious expiration in yoga?
4. Does yoga have any impact on the ECG of the person? How?

Long Answer Questions

1. Examine the various ways in which breath regulation helps an individual.
2. Identify the different types of breathing in yoga and explain them in detail.
3. Establish the relationship between yoga and respiratory health.
4. Explain the effect of yoga on circulatory system of human body.

4.11 FURTHER READINGS

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BLOCK - II

PHYSIOLOGICAL BENEFITS

**UNIT 5 BANDHAS, MUDRAS
AND KRIYAS**

Structure

- 5.0 Introduction
- 5.1 Objectives
- 5.2 What is a Bandha?
 - 5.2.1 Benefits of Maha Bandha
- 5.3 Mudras and their Benefits
 - 5.3.1 Viparita Karani
 - 5.3.2 Physiological Benefits of Viparita Karani
 - 5.3.3 Khechari Mudra
- 5.4 Mahamudra
 - 5.4.1 Physiological Benefits of Mahamudra Meditation
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 - 5.6.1 Physiological Benefits of Yoni Mudra
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5.0 INTRODUCTION

Yoga, as a form of spiritual and physical discipline, has been followed in India since time immemorial. Yoga is a combination of breathing practices, physical workout and meditation. Though initiated in India, yoga has today become a part and parcel of peoples' lives all over the world in order to improve their health and general wellbeing. The word 'Yoga' is a Sanskrit word which means union and Patanjali is known to be the creator of classical yoga. According to him, by practice of yoga the 'cessation of the modification of the mind' becomes possible and easy. Yoga is a combination of numerous mudras, asanas and bandhas. In this unit, you will learn about some beneficial bandhas which can be performed by almost any individual, and they benefit all people regardless of age and bodily conditions.

5.1 OBJECTIVES

After going through this unit, you will be able to:

- Identify the physiological benefits of mula and maha bandhas
- Identify the physiological benefits of Viparitakarani, Khechari, Mula and Maha mudras
- Examine the physiological benefits of Shatkarma or Shatkriyas

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5.2 WHAT IS A BANDHA?

A *bandha* means a lock or bind. This is a yogic condition which is carried out so as to give direction to and control the course of the life force energy known as 'prana' to specific body parts. This bandha is also known as an energetic lock. The yoga practitioners of the past practiced this yogic bandha to stimulate the flow of energy and retain ideal health.

Types of Bandhas

A Bandha or yogic lock has been classified into four categories viz.: *mula*, *uddiyana*, *jalandhara* and *maha*. Each of these is related to a main energy passage and performance of a specific bandha influences the flow of prana to that passage. Some Western practitioners like to give the name of 'energetic seal' to Bandha.

Let us have a brief look at the four different types of bandhas and appreciate their physiological benefits:

- 1. Mula bandha:** Mula is a Sanskrit word which means 'root.' That is the reason why in some parts of the world it is also known as the 'root lock,' This yogic practice involves tightening the perineum muscles inward, and lifting them towards the upward side to hold energy. Practising *mula* bandha encourages the flow of energy to the rectum, stimulating the pelvic muscles and urogenital organs. It also rouses a person's kundalini power.
- 2. Uddiyana bandha:** Uddiyana is a Sanskrit word which means 'to rise up.' While practising this bandha, the upward movement of energy is more forceful as compared to mula bandha. Practice of Uddiyana bandha encourages the muscles of the abdomen while they are pulled inwards, and the chest lifts upward. Besides relieving constipation, uddiyana bandha also boosts metabolism and supports healthy function of the adrenal gland, and thus getting rid of stress and pressure. The other effects of this bandha are that it invigorates the heart chakra (*anahata*), in turn encouraging kindness and compassion.

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3. Jalandhara bandha: Jalandhara is a Sanskrit word comprising three parts viz., roots *jal*, which means “throat,” and *dhara*, which means “flow.” In order to perform this lock, the chin ought to be brought down towards the chest; that is the reason why, it is also commonly known as the “chin lock.” Practice of this bandha increases the function of the thyroid and parathyroid glands, and supports systems such as cardiovascular and respiratory.

4. Maha bandha: Maha is a Sanskrit word which means “great.” That is the reason why it won’t be wrong to call, this ultimate bandha the “supreme bandha” or “triple lock.” Practice of Maha bandha gives health benefits of all three bandhas mentioned earlier to the practitioner. In order to derive benefits of the Maha bandha, the first three bandhas ought to be performed simultaneously, starting with jalandhara bandha and concluding with mula bandha. These bandhas are released in the reverse order, with mula bandha first and jalandhara bandha last.

5.2.1 Benefits of Maha bandha

Maha bandha is an amalgamation of all three bandhas performed together. This practice is used extensively in hatha yoga — asana, pranayama, mudra, bandha, and kriya yoga. This practice is a connection from the ‘exterior’ four practices of yama and niyama (adherences and promises), asana (physical yoga poses) and pranayama (breathing practices) to the ‘interior’ three practices of dharana (taming the mind to focus on a particular object), dhyana (uninterrupted focus on that thing) and samadhi (meditation). It is a pranic exercise which can stimulate the complete pranic capacity in the chakras and draw it into sushumna nadi.

Physical Benefits

This practice of maha mudra has the potential to relieve abdominal illnesses, constipation and can arouse digestive capability. It also has an effect on the hormonal secretions of the pineal gland along with the regulation of the entire endocrine system. Practicing maha bandha on a regular basis can even stop processes like decomposing, deteriorating and aging of the body and revitalise every cell of the body.

This practice locks shakti prana into the central passage and makes it rise within sushumna nadi. Mulabandha directs it upwards, jalandhara bandha directs it downwards, and uddiyana bandha draws the two pranic currents to meet in manipura - the navel chakra centre. At the time and point of meeting of these two opposite poles of energy, they are forced up to ajna chakra, and ‘the mind attains the seat of Shiva’ — the utmost mindful capacity of a human being.

5.3 MUDRAS AND THEIR BENEFITS

*Bandhas, Mudras
and Kriyas*



As mentioned earlier, practice of Yoga entails a lot more than just twisting and turning your body while performing different asanas. A very effective and powerful technique of Yoga is called Mudra. This is an ancient procedure which is practiced while performing pranayama or meditation. The words, 'gesture' or 'attitude' are the English synonyms of the Sanskrit word Mudra. Mudras can be defined as spiritual, emotional, sacred and aesthetic movements or attitudes. Early yogis had defined Mudras as attitudes of flow of energy, which were intended to connect individual pranic strength with universal or celestial force.



Fig. 5.1 Yoga Mudra: A trip on the way to self-discovery

Mudras are an amalgamation of delicate bodily movements which bring about a change in mood, outlook and insight of a person. Besides this, they also give depth to consciousness and attention. A mudra may be a combination of the entire body involving Asana, Pranayama, Bandha and visualization techniques, or it may just be a simple positioning of the hand. Mudras are higher yogic performances which result in the arising of the pranas, chakras and Kundalini. It also helps in establishment of the pranic balance within the koshas and empowers the redistribution of indirect energy to the upper chakras encouraging a higher state of mindfulness. Every mudra creates a different link, which in turn creates a corresponding different effect on the mind, body and prana.

Diseases in a human body occur due to an imbalance created either by lack or excess of any of the five elements of the nature i.e., air, water, fire, earth and space. Fingers of the hands of a human being consist of the features of these

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elements and each of these elements assists a definite and significant function inside the human body. When a finger representative of a particular element is contacted with the thumb, the element known to be existing on that finger is said to be balanced. Thus, curing the disease caused by that imbalance. The practice of mudras regulates the flow of energy having an effect on the balance of air, fire, water, earth and space, thus facilitating healing and promotion of good health.

Fingers associated with the elements of nature are as follows:

- Air (Vayu)- Index Finger
- Fire (Agni)- Thumb Finger
- Water (Jal)- Little Finger
- Earth (Prithvi)- Ring Finger
- Space (Akash)- Middle Finger

The yoga Mudras can be characterized into different groups dependent on the part of the body used for practicing the mudra. We will have a quick look at some of them while we will study some of them in detail.

1. Jnana/Gyan Mudra (Psychic gesture of Knowledge)

Gyan mudra is the basic yoga mudra which assists in improvement of concentration and knowledge.



Fig. 5.2 Gyan Mudra and Chin Mudra

Chin Mudra (Psychic gesture of consciousness)

Chin mudra is a variation of Gyan mudra, this helps cure insomnia and improves concentration and memory power.

2. Chinmaya Mudra (Gesture of awareness)

*Bandhas, Mudras
and Kriyas*

Chinmaya Mudra helps in promoting physical and mental health.



Fig. 5.3 Chinmaya Mudra

3. Adi Mudra (First Gesture)

This mudra is practiced in order to compose the mind and nervous system.



Fig. 5.4 Adi Mudra

4. Vayu Mudra (Gesture of air)

Performance of Vayu Mudra helps in balancing the air element of the practitioner's body.



Fig. 5.5 Vayu Mudra

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5. Agni Mudra (Gesture of fire)

Agni mudra balances the fire element of the body. People suffering from indigestion or acidity should not perform this mudra.



Fig. 5.6 Agni Mudra

6. Varun Mudra (Gesture of water)

Performing Varun mudra is for balances the water element of the body. It enhances beauty and makes the skin glow.

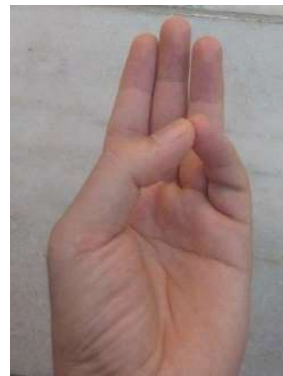


Fig. 5.7 Varun Mudra

7. Prana Mudra (Gesture of life)

The Prana mudra balances the element of life in the practitioner's body, it builds the immune system and sharpens the vision.



Fig. 5.8 Prana Mudra

8. Shunya Mudra (Gesture of sky)

Shunya mudra helps the individual to attain a level of composure and serenity.



Fig. 5.9 Shunya Mudra

9. Surya Mudra (Gesture of sun)

Surya mudra balances the element of sun in the human body. For best results, this mudra must be performed during early hours of the day.



Fig. 5.10 Surya Mudra

10. Prithvi Mudra (Gesture of the Earth)

Prithvi mudra balances the element of earth in the human body, it helps in attainment of glowing skin.



Fig. 5.11 Prithvi Mudra

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11. Linga Mudra (Gesture of heat)

Linga mudra enhances the body heat by focusing on the element of fire in the body.



Fig. 5.12 Linga Mudra

12. Apana Mudra (Gesture of digestion/vital air)

Apana mudra balances the digestive element of the human body. It is also called the purification mudra.



Fig. 5.13 Apana Mudra

13. Dhyana Mudra (Gesture of Meditation)

This mudra was used by early yogis at the time of meditation to build and improve the ability to concentrate and heal.



Fig. 5.14 Dhyana Mudra

5.3.1 Viparita Karani

*Bandhas, Mudras
and Kriyas*



Fig. 5.15 Viparita Karani

Viparita Karani is also known by the name of Inverted Lake. This Yoga pose has a wide range of health benefits to its credit. Besides, it is also well known for its anti-aging effects. It has been inscribed in the ancient Hindu scriptures that regular practice of Viparita Karani reduces wrinkles along with banishing old age and death. The half-inverted position of this asana is curative in nature as it gets blood flowing to those parts of the body which need it most. This pose comes in handy in improving ailments like arthritis, high or low blood pressure, respiratory disorders, and menopause.

How to perform Viparita Karani

- Lie on the floor close to a wall and take deep, steady breaths.
- Exhale and at the same time swing your legs up onto the wall.
- Adjust your body in case of any discomfort so that your sitting bones have no pain.
- Rest your head flat on the floor, keep the back bone straight, in order to avoid your kneecaps from locking.
- Keep your legs up in a vertical position, only partly bent.
- Release your belly weight toward the back of the pelvis, deeply into the torso.
- Soften the eyes and turn them down towards your heart.
- After you are coming out of Viparita Karani pose, be sure to lie on your side for a few breaths.
- For some time sit upright with your back against the wall.
- Slowly rise to your feet.

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5.3.2 Physiological Benefits of Viparita Karani

The various benefits of the Viparita Karani are listed as follows:

- The practice of this pose controls the flow of blood
- Relieves backache
- Helps in relieving swollen ankles and varicose veins
- Helpful in alleviating problems related to eyes and ears
- Helps in good digestion
- Helps in restoration of tired feet or legs
- Helpful in solving problems related to testicles in males and ovaries in females
- Relieves symptoms of mild depression and insomnia
- Provides relief during migraine and headache, specifically when performed with a tight bandage wrapped around the forehead and back of the skull
- Helps in maintaining youth and vitality
- Calms anxiety
- It is beneficial in alleviating cramps during menstrual period
- Helpful in stretching the back of the neck, front torso, and back of the legs

5.3.3 Khechari Mudra

The ancient yogis used to practice the Khechari mudra in order to experience the bliss of nectar. Khechari mudra is the practice of taking the tongue backwards and folding it so that it could be put into the pharyngeal passage and slowly drawn-out up towards the top of the nose at the eyebrow centre. At the time of accomplishing this, the tongue stops just under the location of the pituitary gland and the practitioner experiences the bliss of meditation.

In its actual form, Khechari mudra is an advanced technique which involves cutting the frenum attaching the tongue to the bottom of the mouth. But this can and should be done only under the supervision of a master and ordinarily at an early age. It is not possible for many people to accomplish this hence an easy version named, 'nabho mudra' is performed. In this practice, the tongue is held against the soft palate and over a period of time becomes supple enough to move into the pharynx. A low protein diet helps this process, as does simhasana (the lion pose).

Physiological Benefits of Khechari Mudra

The physical benefits of this yogic pose have been stated in many Hindu scriptures which are as below:

- **According to The Hatha Yoga Pradipika:** "When the yogi now curls his tongue upward and back, he is able to, close the place where the three

paths meet' The bending back of the tongue is khechari mudra and the closing of the three paths in akasha chakra. The yogi who remains but half a minute in this position is free from illness, old age and death. He who has mastered khechari mudra is not afflicted with disease, death sloth hunger', thirst and swooning." (HYP 8: 36-39)

- **According to The Gherand Samhita:** "The body becomes beautiful; samadhi is attained, and the tongue touching the holes in the roof of the mouth obtains various juices. First he experiences a salty taste, through alkaline to bitter then astringent, then he feels the taste of butter then ghee, then of milk, then of curds, then of whey, then of hone then of palm juice, and lastly arises the taste of nectar." (GS iii, 30-32)
- Khechari mudra can be practiced with pranayama and Shambhavi mudra, gazing at the eyebrow centre. All these practices symbolise revolving the mind inwards. The outward facing eyes are made to turn inward and look at the ajna chakra or third eye in the eyebrow centre.
- The practice of Khechari mudra turns the tongue, which always points outward, inward and up towards the pituitary gland, the physical association of sahasrara chakra. These practices, turn the attention of the mind inwards and stimulate prana in this direction.
- The practice of Khechari mudra impacts the nectar glands by which thirst and hunger can be conquered, and the body can be stopped from decaying physically.
- **As stated by Theos Bernard in his book Hatha Yoga:** "As soon as I placed the tongue behind the palate, the saliva began to flow in a constant stream. In this way I was supposed to determine the condition of the body fluids. At first it was thick, heavy and shiny, eventually it became thin, clear and smooth.....As for the effectiveness of the practice, I can report that I did notice a lack of hunger and thirst when using it... I was able to subdue the hunger pangs so that it was necessary to eat only at the appointed time, without any of the reactions that would otherwise have ensued from the sparse diet."

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Check Your Progress

1. What is bandha?
2. What is the meaning of the word 'mula'?
3. What does maha bandha refer to?
4. What are mudras?
5. What is the significance of shunya mudra?

5.4 MAHAMUDRA

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Fig. 5.16 The Mahamudra pose

Mahamudra is also known as the ‘Great Hand Posture’. Mahamudra, is a Sanskrit word, which means the ‘great symbol’ or the ‘great locks’ or the ‘great seal’. It is a simple and natural exercise of ‘contemplation’, which rests on the basis of ‘insight’ and ‘inner peace’. This meditation engages all three energetic ‘seals’ or ‘Bandhas’ i.e. ‘Moola Bandha’, ‘Uddiyana Bandha’ and ‘Jalandhara Bandha’ in order to open up the vitality passages of the body by guiding the ‘prana’ or ‘vital energy’ in the correct direction

The Practice of Mahamudra Meditation

Following are the steps involved in practising Mahamudra meditation:

1. Sit on the floor in the Staff Pose or Dandasana, with the spine straight and hands on the floor at the sides of your hips.
2. Press both palms down against the floor. So that the chest opens up.
3. The sitting bones should be firmly rooted to the floor. Spread your legs.
4. Be comfortable and now, take a deep breath and pull your right foot towards your right thigh. Bring the knee down while breathing out.
5. Take another deep breath and pull your arms up along with it. Aim to bring the arms right above your head, and all your fingers straight. At this stage, breathe out and engage your ‘Moola Bandha’ now.
6. Exhale now and roll to the front section of your sitting bones, keeping your spine and the entire back absolutely straight. Now, bring down your arms and latch them onto the plane of your foot while involving the Jalandhara Bandhas (in the elevation of your head) and Uddiyana Bandha (in your tummy) in the movement.
7. The posture thus acquired will create a ‘space’ in the body and mind. Be consciously aware of it, this will shift your focus from the breathing entirely.
8. After this, let your foot and the bandhas go off and take a deep breath. Begin to straighten your arms.

9. In the end, close your eyes without moving your body. Take a deep breath and spread out the right leg.
10. Repeat all the above steps for the other side of your body and in order to conclude the mahamudra meditation.

5.4.1 Physiological Benefits of Mahamudra Meditation

The physiological benefits of Mahamudra meditation are many in number which prove to be beneficial for particular parts of the body as well as the entire body. Let us have a look at them:

- Makes the muscles of the body strong e.g. abdominal muscles, shoulder muscles, upper and lower back muscles, etc.
- Strengthens the lower parts of the body like hips, thighs, legs, etc.
- Boosts the body's immunity.
- Develops the functionality of the nervous system.
- Rejuvenates the entire body to a great amount.
- Works towards healing many diseases in the body.

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5.5 THE MAHA VEDHA MUDRA (THE GREAT PIERCING ATTITUDE)



Fig. 5.17 The Maha Vedha Mudra Pose

Maha Vedha Mudra is an essential physiological exercise. 'Maha' is a Sanskrit word which means great and 'Vedha' means piercing. The idea behind performing this yoga pose is to channelize the 'prana' or life force which is collected inside the body by means of Mudras, Maha Bandha and Maha Mudra.

The practice of Maha Vedha Mudra

Outstretch your right leg while sitting with your left heel beneath your anus. Lean forward and hold the big toe of the right leg with both hands. Inhale and exhale deeply. Perform Jalandhara, uddiyana and moola bandhas at the same time. Concentrate, one after the other on muladhara, manipura and Vishuddhi chakra. Take in deep and slow breaths. Relax your entire body and rest for a while. Repeat the Maha Vhedha mudra three times.

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Physiological Benefits of Maha Vedha Mudra

- Regular and proper performance of Maha Vedha Mudra influences mooladhara, manipura and vishuddhi chakras, which manipulates and harnesses the vitalities inside, helping the mind to concentrate and meditate better.
- Practice of this mudra helps the practitioner unite with his or her inner self.
- The chakras and psychic channels penetrate the consciousness in this mudra.
- Maha vedha mudra has a influences at a pranic level profoundly. Together with maha mudra; it supercharges the whole body and mind.

5.6 YONI MUDRA

The practice of Yoni Mudra has been mentioned in mythology. During the ancient times Yoni mudra was a part and parcel of people's daily life which is the reason why people could afford to keep illnesses at bay. In the fast moving and stressful lifestyle of the contemporary period, the yoni mudra helps keep the practitioner take a break from the outer world and connect with his inner self.

Yoni is a Sanskrit word which means 'Uterus' or 'womb'. A baby inside the mother's womb though alive is detached from the outer world. It has absolutely no idea about the stresses and tensions of the outside world. Just like that, the practice of Yoni mudra detaches the practitioner from the external world.

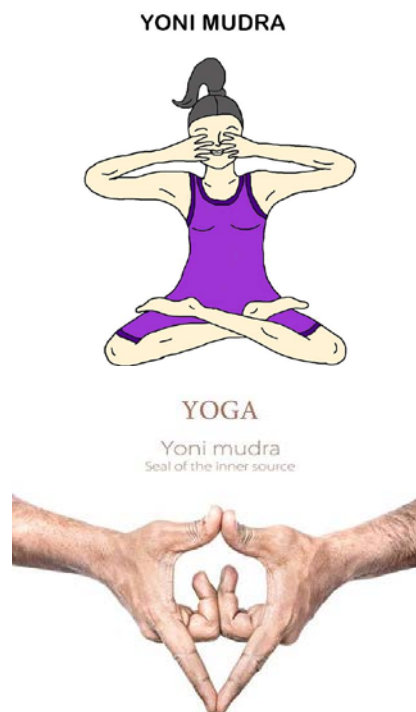


Fig. 5.18 a and b Yoni mudra

The practice of Yoni Mudra

1. Sit comfortably wearing loose fitting clothes. Choose a quiet place, where concentration can be maintained. Take a deep breath and begin the process.
2. Place your thumbs in the ear close to your ear holes.
3. Close your eyelids by placing your index fingers on them.
4. Push your middle finger on the either sides of your nostrils.
5. Press your lips together with the remaining fingers.
6. Release your middle finger while continuing to inhale and exhale.

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5.6.1 Physiological Benefits of Yoni Mudra

Practice of Yoni mudra has many health benefits, a few of which are enumerated below:

- Helps in relieving stress and depression
- Helps in maintaining a balance in the nervous system
- Rejuvenates the mind and soul
- Gives a sense of mental peace
- Gives spiritual calmness and peace to your heart and mind

5.7 SHATKARMA

Shatkarma is the Sanskrit word which denotes six yogic purification techniques (*kriyas*) as defined in the “*Hatha Yoga Pradipika*.” These purifying techniques help in keeping the body strong, clean and healthy. It is said that these techniques remove toxins from the body and also all blockages blocking the flow of prana in the body.

The various Shatkarmas

There are six shatkarmas, each a different purifying technique:

1. *Neti*: a nasal cleansing procedure which intends to purify the nasal channels and cleanse the sinuses. There are two ways of performing this technique: first is known as *jala neti* which is performed by using a neti pot and saline solution for cleansing the nasal passages, and the second is called *sutra neti* in which a thread is passed through the nostrils and taken out of the mouth.
2. *Dhauti*: This process is used to cleanse the alimentary canal, including the oesophagus, the mouth, the stomach, intestines and rectum. Different parts of the gut can be cleansed by using 11 types of dhauti. A popular way of doing this is swallowing a length of cloth so that phlegm, bile and contaminations from the esophagus and stomach can be removed.

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3. *Nauli*: This process is used to cleanse the abdomen and the abdominal muscles to massage and rouse the digestive organs. The abdominal muscles are prodded forward then contracted in a wave-like movement which enhances “bodily fire.”
4. *Basti*: This process is used to cleanse the large intestine with the use of water or without it. The process performed with water is called, *jala basti*, in which the practitioner sits in a tub of water and draws it up into the rectum by practicing *uddiyana bandha* and using the nauli kriya and then expels the water thus taken in.
5. *Kapalabhati*: This is a breathing technique which means ‘shining skull.’ While practising this procedure, the breath is exhaled out through the nostrils by use of force. The abdominal muscles are also strongly drawn in after which the practitioner inhales naturally. This is repeated 20 times in quick, rhythmic succession.
6. *Trataka*: This process is used to cleanse the eyes and refining mental focus. It is also known as the blinkless stare. Constantly staring at the flame of a candle is one way of performing this procedure. It is known to increase blood circulation to the eyes and help strengthen them.

Check Your Progress

6. What is another name for mahamudra?
7. State any one benefit of the mahamudra.
8. What is the meaning of the word ‘Yoni’?

5.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. A bandha means a lock or bind. This is a yogic condition which is carried out so as to give direction to and control the course of the life force energy known as ‘prana’ to specific body parts.
2. Mula is a Sanskrit word which means ‘root.’
3. Maha bandha is an amalgamation of all three bandhas (Mula, Uddiyana and Jalandhara) performed together.
4. Mudras are an amalgamation of delicate bodily movements which bring about a change in mood, outlook and insight of a person. Besides this, they also give depth to consciousness and attention. A mudra may be a combination of the entire body involving Asana, Pranayama, Bandha and visualization techniques, or it may just be a simple positioning of the hand.
5. Shunya mudra helps the individual to attain a level of composure and serenity.

6. Mahamudra is also known as the ‘Great Hand Posture’.
7. Mahamudra boosts the body’s immunity.
8. Yoni is a Sanskrit word which means ‘Uterus’ or ‘womb’.

5.9 SUMMARY

- Yoga is a combination of breathing practices, physical workout and meditation. Though initiated in India, yoga has today become a part and parcel of peoples’ lives all over the world in order to improve their health and general wellbeing.
- This bandha is also known as an energetic lock. The yoga practitioners of the past practiced this yogic bandha to stimulate the flow of energy and retain ideal health. A Bandha or yogic lock has been classified into four categories viz.: *mula*, *uddiyana*, *jalandhara* and *maha*.
- Maha bandha is an amalgamation of all three bandhas performed together. This practice is used extensively in hatha yoga — asana, pranayama, mudra, bandha, and kriya yoga.
- A very effective and powerful technique of Yoga is called Mudra. This is an ancient procedure which is practiced while performing pranayama or meditation. The words, ‘gesture’ or ‘attitude’ are the English synonyms of the Sanskrit word Mudra. The yoga Mudras can be characterized into different groups dependent on the part of the body used for practicing the mudra.
- The ancient yogis used to practice the Khechari mudra in order to experience the bliss of nectar. Khechari mudra is the practice of taking the tongue backwards and folding it so that it could be put into the pharyngeal passage and slowly drawn-out up towards the top of the nose at the eyebrow centre.
- Mahamudra, is a Sanskrit word, which means the ‘great symbol’ or the ‘great locks’ or the ‘great seal’. It is a simple and natural exercise of ‘contemplation’, which rests on the basis of ‘insight’ and ‘inner peace’.
- Maha Vedha Mudra is an essential physiological exercise. ‘Maha’ is a Sanskrit, word which means great and ‘Vedha’ means piercing. The idea behind performing this yoga pose is to channelize the ‘prana’ or life force which is collected inside the body by means of Mudras, Maha Bandha and Maha Mudra.
- The practice of Yoni Mudra has been mentioned in mythology. During the ancient times Yoni mudra was a part and parcel of people’s daily life which is the reason why people could afford to keep illnesses at bay.

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- *Shatkarma* is the Sanskrit word which denotes six yogic purification techniques (*kriyas*) as defined in the “*Hatha Yoga Pradipika*.” These purifying techniques help in keeping the body strong, clean and healthy. It is said that these techniques remove toxins from the body and also all blockages blocking the flow of prana in the body.

5.10 KEY WORDS

- **Bandha:** A *bandha* means a lock or bind.
- **Mula:** Mula is a Sanskrit word which means ‘root.’
- **Uddiyana:** It is a Sanskrit word which means ‘to rise up.’
- **Mudra:** Mudras can be defined as spiritual, emotional, sacred and aesthetic movements or attitudes.
- **Maha Vedha:** ‘Maha’ is a Sanskrit, word which means great and ‘Vedha’ means piercing.
- **Yoni:** Yoni is a Sanskrit word which means ‘Uterus’ or ‘womb’.
- **Shatkarma:** *Shatkarma* is the Sanskrit word which denotes six yogic purification techniques (*kriyas*) as defined in the “*Hatha Yoga Pradipika*.”

5.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Name and define the four types of bandha.
2. Which are the fingers associated with the elements of nature?
3. What is Khechari mudra and what are its uses?
4. List the physiological benefits of maha vedha mudra.

Long Answer Questions

1. Discuss the various benefits of maha bandha.
2. Identify and explain the 13 mudras.
3. How is Viparita Karani performed? What are its physiological benefits?
4. Analyse the physiological benefits of performing Mahamudra meditation.
5. What is shatkarma and which are its various elements? Discuss.

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UNIT 6 INTRODUCTION TO SHATKRIYAS

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6.0 INTRODUCTION

Hatha yoga is a combination of many yogic kriyas which are of prime importance and very important practices in practice yoga. These kriyas, if performed properly, cleanse the body of all toxins internally and make it strong externally. In the practice of Hatha yoga a lot of emphasis is laid on the cleaning process called the Kriyas. Hatha yoga believes in the fact that only inside a healthy and clean body can a healthy and clean mind exist. There are six yogic kriyas or cleansing practices in all, that is why they are known as shat-karma (six-actions). These practices are difficult to perform and require great deal of practice to master. Some people might find them even revolting or un-natural. If they are not performed under proper and learned guidance, they may involve some risk of harm to the practitioner.

6.1 OBJECTIVES

After going through this unit, you will be able to:

- Introduce the process of Shatkriyas
- Discuss the procedure, benefits and precautions for jal neti
- Examine the procedure, benefits and precautions for sutra neti
- Explain the procedure, benefits and precautions for Shankhprakashana

6.2 SHATKRIYAS

The shatkriyas, though a part of the traditional yogic practices, are not very popular in the present-day scenario. In view of their difficulty level of performance, most Yoga instructors do not encourage these practices. Nevertheless, it would be totally wrong to ignore these very important traditional yoga practices as they have been mentioned as pre-requisites of learning yoga in the traditional yoga scriptures. These practices are believed to cleanse the body in the process of preparation for hatha yoga. This can be compared to cleaning one's house up before decorating it. Sure enough, no one would like to decorate a dirty house. Cleanliness is the first and foremost step of beautification, hence it is extremely important to clean up the body by practising these kriyas before venturing into Yoga.

The term shatkarma or shatkriya denotes 'six actions.' These six actions were given great importance by the sages of ancient times who understood the value of the practice of Yoga: 'In Yoga, control of the body starts with the cleansing processes known as the kriyas, the first step to eliminate poisonous substances (toxins) accumulated in the system'.

The kriyas or the cleansing processes are forcefully and intensely sanitizing, and they act at all levels of 'being'. After the body is purified of all toxins, then the practitioner is trained in Trataka (concentration). These six actions or Shatkarmas are the foundation of the asanas and meditative practices of Hatha Yoga.

The six kriyas are as follows:

- (1) Dhouti
- (2) Basti
- (3) Neti
- (4) Nauli
- (5) Trataka
- (6) Kapal bhati

Let us now briefly understand how each one of these kriyas work towards purification of the body and in turn, end up purifying the mind.

1. Dhauti

Dhauti is the foremost and most difficult of all kriyas. There is a requirement to swallow and re-gurgitation of a fine muslin cloth or ingesting warm saline water and vomiting it out. This kriya helps in curing serious ailments of the stomach. Performance of this kriya cleanses the mouth, throat and stomach.

2. Basti

Basti means colonic irrigation or cleansing. This ancient art of cleansing the colon has been prevalent since time immemorial in which warm water is taken in through

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the rectum and then excreted the same way after holding inside for some time. The Basti kriya aims at cleansing the lower part of the colon up to the sphincter.

3. Neti

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By practicing Neti kriya nasal passages and the throat area are cleansed. The two different ways of performing this kriya are: by the use of water (jala-neti), in which water is drizzled into one nostril and it automatically comes out through the other or by the use of a thread (Sutra-neti) in which a fine thread is taken inside one nostril and then pulled out of the mouth by way of the throat. Other means of performing the Neti kriya are milk (dugdha-neti) or ghee (ghritha-neti). Neti is a foremost requirement for cleansing the respiratory passages for practicing pranayama properly.

4. Tratak

Tratak kriya is meant to cleanse and strengthen the eyes. While performing this kriya, the practitioner is expected to focus his eyes usually on a small object or the flame of a candle in a dark room. The practitioner must not blink and maintain his gaze until the eyes start to water.

5. Nauli

Nauli kriya involves the left and right churning of the abdominal column. Beginners try it out by taking holding their breath at the end of their exhalation, and creating a vacuum. The next step involves sucking everything up and into the rib cage, holding it there for a short while and pushing everything back out. Eventually the practitioner masters the art of belly movement and starts left to right rhythmic movements also.

6. Kapalbhati

Regular practice of kapalbhati (forceful repeated in and out breathing technique) cleanses the respiratory system, particularly the lungs.

The six shatkarmas have a very positive effect on the purification of the body. Their results are manifold and wondrous and are practiced by established, esteemed and eminent yogis.

6.3 JAL NETI (NASAL CLEANSING WITH WATER): CONTRA-INDICATION AND BENEFITS

Jal Neti is one of the six-purification procedures or 'Shatkarmas' mentioned in ancient Yoga. This technique, as has been discussed before, is a technique used by Yoga practitioners to stay away from diseases especially in the nasal tract. This technique is also used to improve breathing and removing any blockages in the

nasal tract. Practicing Jal Neti is an effective way of maintaining good nasal hygiene, just as brushing the teeth is essential for maintaining good dental hygiene. In this technique, water (generally salted) is used to cleanse and disinfect the nasal path, starting from the nostrils to the throat.

The sinus passages can get blocked with contaminations which can become a cause of infections, swellings and pains in the nose or head. Jal Neti, therefore is the solution provided by Hatha Yoga Pradeepika as a simple technique to keep the sinuses free of all such impurities. Nasal hygiene is exceedingly important as it is connected to numerous disorders like sinusitis, migraine, headaches, allergies and asthma. Neti is a reasonably simple technique which can be practised while carrying on one's daily routine. It is something which can be included in the daily hygiene activities e.g. brushing one's teeth in the morning or having a bath. All it takes is just a few moments to practice this shatkarma whereas the benefits borne by it are tremendous as it helps to get rid of many nasal and sinus cavities related problems.

Things Required to Perform Jal Neti

- A Neti pot
- A pinch of salt
- Lukewarm water

To perform the kriya of Jala Neti the practitioner requires a Neti Pot, some salt and water. Neti pot is a tiny pot having an elongated spout on the side which can be inserted in one nostril out of the two. The neti pot could be made of copper, steel, ceramic or even plastic. These pots are easily available in most health stores that sell yoga products.

In order to prepare the salt water solution, 1 table spoon of salt must be added to one litre warm water. The water should neither be too hot nor too cold, it should be just the right temperature (slightly warm) so that tissues inside the nostrils are not irritated. Neti thus practiced using salt water is called Jala Neti, where as Neti performed by using milk is known as Dugdha Neti.

The process to Practice Jala Neti (Nasal Cleaning with Water)

- Pour the warm mixture of salt and water into the Neti pot.
- Place the spout of the pot into the left nostril.
- Tilt your head gently and open your mouth, ensure to breathe through the mouth during performance of the kriya.
- Adjust the tilt of your head upto a position where water inserted into your left nostril automatically starts flowing into the right nostril and then running out.
- Carry on until the water in the pot finishes.

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- Fill up the pot again with similar kind of salt water and repeat the procedure, this time inserting water through the right nostril.
- The kriya may be repeated, alternating between nostrils as many times as necessary.

6.3.1 Benefits of Jal Neti

Practicing Jal neti has many benefits, a few of which have been enlisted below:

- Daily practice is advantageous in maintaining good nasal hygiene. It removes the muck and germs stuck in the nasal cavities along with the mucus.
- It gives a soothing effect to the sensitive tissues present in the nose. These sensitive tissues can alleviate an attack of rhinitis or allergies.
- It is beneficial for people suffering from asthma and clearing of sinuses makes breathing easier.
- It decreases infections of the tinnitus and middle ear.
- It helps in decreasing attacks such as sinusitis and migraine.
- It is also helpful in alleviating upper respiratory problems such as sore throats, tonsils, and dry coughs.
- Jal neti also has the potential to clear the eye ducts and improve vision.
- Clearing nasal passages is helpful in improving the sense of smell and in so doing improving digestion.
- It provides a calming effect to the nervous system and the mind. It is even helpful in relieving stress and bringing clarity to the mind.
- People who practice Jal Neti on a regular basis often experience a decrease in their anger and anxiety.
- It is beneficial in improving the quality of meditation.

6.3.2 Precautions to be Adhered While Performing Jal Neti

- Care should be taken to dry the nose properly after finishing the kriya.
- People suffering from hypertension should be careful while drying their nose. In case of feeling dizzy, they should ensure to stand upright.
- A moist nose may be a cause of a subsequent infection.
- Jal Neti should be learnt from a yoga expert and carried out with utmost care and caution in order to get the best results.

Jal Neti, if practised on a routine basis, can be helpful not only in cleansing the nasal cavities but also in aligning one's body, mind, and soul. Therefore, it is best to practice the kriya daily and not only during a bout of nasal blockage or cold.

Check Your Progress

1. What is the aim of Shatkriyas?
2. What is Jal Neti?
3. Why is Jal Neti required?

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6.4 SUTRA NETI (NASAL CLEANSING USING A CORD): CONTRA-INDICATIONS AND BENEFITS

Sutra Neti is yet another way of performing the nasal cleansing kriya. This is a very effective way of keeping the nasal cavities open and keeping the flow of air moving smoothly. Sutra Neti is carried out by inserting a cotton thread or a very thin rubber tube into one of the nostrils and then brought out through the mouth. Sometimes the thread is smoothly pulled to and fro for a little while. It is then taken out and put back in again through the other nostril and pulled out of the mouth again like the previous time. By practise, it may be possible to pass the thread from one nostril to the other nostril.

Sutra Neti has many benefits to its credit and is highly recommended for people who have been trying Jala Neti for some time and who suffer from blockage of the same one nostril in comparison to the other. Sutra Neti proves to be more beneficial in cases where there may be some sort of fat obstruction e.g. a cartilage blocking the nasal cavity. Apart from a medical procedure, Sutra Neti is a worthwhile substitute for getting rid of such obstructions. At first, a person suffering from nasal blockages should try to accomplish the three forms of Jal Neti by use of water, and only after being unable to clear the obstructions, a thorough medical check-up of the nose should be done in order to ascertain and the cause of the obstruction. Sutra Neti should always be learned under the guidance of an experienced yoga teacher.

It is very important to maintain the cleanliness of the thread being used for performing the Sutra Neti. It is best to wash the thread with warm water before and after the use in some cases it may be even beneficial to use medicated oils. It should then be dried immediately. People suffering from deviated septum, polyps, or other such nasal abnormalities must consult their ENT specialist or an experienced yoga therapist.

The process to practice Sutra Neti (nasal cleaning with thread)

- The string is deliberately, softly, and with conscious feeling (non-mechanically) introduced into the nasal cavity floor in absence of any pain.
- The nasal cavity is shaped in such a way that it can be compared to a long cave narrowing at the roof and being widest at the base, so the thread has

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to be pointed toward the back of the throat, a little downward, and somewhat inward, so that smoothly glides through the widest cavity toward the inside back opening of the nose.

- The aim should be to pass it through the valve (swollen lip) at the root of the nose into the upper back of the throat. At that point it should be held by the index and middle fingers of the opposite hand (which works as a tong) from where it should be pulled out after a gentle massage by pulling back and forth on the string a few times.

6.4.1 Precautions to be Adhered While Performing Sutra Neti

- Care should be taken that insertion of the thread does not cause any pain, whatsoever.
- Occurrence of pain could be an indication of anything such as: going too fast, wrong direction of the thread, the thread being caught up against the nasal wall, or presence of some other obstruction.
- In such a situation, the pressure should be immediately released and the thread should be twisted in different directions to reach a clear and unobstructed passage through the nasal cave.
- It should be ensured that the tip of the thread is straight at the time of insertion, so that it goes under the medial bottom lip of the nasal-pharyngeal valve at the entrance to the throat, and is pointed downward toward the mouth from where it is easy to pull it out.
- It is not compulsory to grasp the thread and pull it to and fro through the nose. Most benefit is achieved by just passing the thread up to and through this nasal-throat valve while softly rubbing the membranes in the nasal cavity which reflex back to the strong nerve groups.
- Sometimes putting fingers inside the throat in order to hold the thread end or sometimes even the end of the thread itself touching the back of the throat can cause vomiting.
- The trick is to go slow and breathe consciously.

With a little practice and some patience, the entire procedure may not even take ten seconds. So much so that sometimes people are even able to successfully perform kriya in the very first go, while others may take up to a month or longer. It is best to allow the mucous to flow if it is activated by the insertion in the initial stage of the kriya. Keeping a good supply of tissues within reach always comes in handy. The activity should be introduced in a very gentle, relaxed and slowly manner. It is also very important to keep breathing deeply. One may feel ticklish and tend to sneeze a lot initially and to remove profuse mucous from the sinus so it is best to keep lot of tissues or hankie close by. As the mucous membranes, nerves, glands, organs, and tissues of the nose, throat, ears, eyes, sinuses, and cranium are toned, stimulated, invigorated, and purified the body's reaction becomes less dramatic.

Sutra Neti is one of the most powerful and advantageous, yet a very simple procedure from the bounty of the Hatha Yoga shatkarmas. It is best to perform it soon after waking up in concurrence with the other morning cleansing activities.

6.5 SHANKHAPRAKSHALANA (INTESTINAL CLEANSING): CONTRA-INDICATIONS AND BENEFITS

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Shankhaprakshalana is a very important hatha yoga practice, which comes under the banner of dhauti kriya, this is also known by the name of varisara dhauti. Dhauti denotes to 'internal washing' and vari means 'water'. Generally, the term shankhaprakshalana is applied, shankha meaning 'conch', because it resembles the stomach and intestines; prakshalana means 'cleaning'.

Shankhaprakshalana is not just an exercise related to the stomach and intestines, but is a technique which enables detailed cleansing. It generates an overhaul action which has an effect on the lungs, nervous system, skin, sinus area, the entire body, along with the practitioner following the regime of special food and asanas. Routine practice of this procedure witnesses the reduction of so many diseases in the body, especially diabetes. It is undoubtedly a positive leap towards attainment of good health.

A serious practitioner of yoga has many bodily benefits while performing this practice on a regular basis. A lighter, more flexible, physical body are some fallouts of this practice. Numerous metabolic acids and chemical wastes leading to rigidity, fatigue and heaviness for instance, lactic acid and uric acid are washed away. The practice results in a clearer and more alert mind as in the case of fasting, but in this case the practitioner does not have to undergo the irritating sensation of an empty stomach.

Regular practice invigorates the practitioner to abstain from intake of toxic substances like cigarettes, alcohol and other habits on a permanent basis. It opens a gateway to a new direction, new food, new habits and the foundation for a positive fresh view of life are set.

Performing Shankhaprakshalana

Obviously due to occurrence of such dramatic changes within the body, it is not advisable to perform shankhaprakshalana too frequently. With respect to normal, healthy people, once or twice a year, around changing of seasons, it is sufficient to practice shankhaprakshalana. As during the process there is a readjustment of the body's temperature regulating mechanism (thermostat), which ensures a lower body temperature and continuous digestive capacity in the otherwise not so easy summer and monsoon months. People suffering from conditions like diabetes, asthma, mild constipation, etc. it can be beneficial if performed more frequently.

Under no circumstances should shankhaprakshalana be practised alone and without proper and skilled guidance. A peaceful and tranquil surrounding under the guidance of an expert guide on hand brings about the best results.

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The practice of shankhaprakshalana

The practice of shankhaprakshalana, performed 3-4 hours in a week gives the benefit of a complete physical renovation. It is actually initiated from the previous night of the practice, when the practitioner takes just a light meal. It is important to bathe early the next morning, before the practice as the practitioner is not permitted to bathe during or after shankhaprakshalana, even on a very hot day.

After completion of cleansing of the intestines, kunjla kriya and neti kriya should be performed, followed by a mandatory 30-45-minute rest. Nevertheless, the practitioner must try to avoid sleep at all costs, so that complete cessation of intestinal activity can be avoided. After a break a liquid type khichari of rice, mung dal and a little haldi (tumeric) must be taken as a meal, along with 2-3 teaspoons of ghee (clarified butter). A handsome quantity, usually two or three full plates of khichari and ghee must be eaten in order to reline the walls of the intestines and reenergise gastric motility.

Khichari may be eaten again on feeling hungry, and water must be consumed in large amount during that afternoon 3-4 hours after the initial intake. The practitioner is not allowed to take any other kind of food, drink, sweets, etc. in any form.

On that day any such movement that has the potential to create excitement, tension or change of temperature must be avoided as the body, being in a sensitive state, is susceptible to cough, cold or fever. Sitting in the sun, strenuous walking, bathing, athletic activities, movies, excursions, sexual intercourse, work, sitting under a fan or in an air-conditioned room must be avoided as an alteration of body temperature or unwarranted physiological activity may be straining. Resting in a quiet and peaceful environment is the best practice. The practitioner should avoid performing any yoga asanas for two days, until the tissues and processes have completely recovered.

Subsequent to the practice, at the time when the mind and body are in an untainted and calmed situation, it is best to practise mouna (silence), likhit japa (written chanting) or study of spiritual books. This gives the practitioner a chance to 'come back to earth' again.

In case of a sensation of headache or vomiting during afternoon, kunjla or neti kriya, followed by rest in shavasana can prove to be very beneficial. Medicines of all type must be avoided for some days.

Food restrictions

From the following day after shankhaprakshalana a modified preferably salt less diet consisting of khichari, dal, boiled vegetables, roti, dahlia, rice and some haldi

(turmeric) must be consumed. All dairy products including milk, cheese and dahi (curd) are to be abstained and sweets, fruits, tea, coffee, processed and refined foods, sour, bitter, pungent and spicy foods, chilli, egg, onion, garlic, potatoes and any other underground vegetable, tomatoes and eggplant can also not be consumed. Intoxicants, non-vegetarian food, tobacco etc. must be avoided for another couple of weeks.

In order to reap the true and best rewards of shankhaprakshalana it is absolutely necessary to strictly adhere to the prescribed diet. Any deviation to the rules usually creates a disturbance, which if not seen as an immediate result may unfold at a later stage. The reason behind this is the sensitivity of the intestines during this important period, because they are recreating the correct internal medium, the correct acid/alkaline balance. As well, the protective cellular lining on the intestinal wall, which has been removed, ought to be completely reinstated and an appropriate bacterial flora re-established. Following the initial two-week period, normal diet can be restarted.

6.5.1 Limitations

Obviously, with such a power packed practice, just as with all kriyas, there exist some limitations with respect to who is fit to practise. It goes without saying that people suffering from ulcers, heart disease, hypertension or hypotension, epilepsy or renal failure should not venture into trying shankhaprakshalana. If at all they plan to do so, it must be strictly done under medical supervision, although an abridged version of the practice, ‘laghoo shankhaprakshalana, may sometimes be prescribed. In general, this practice is may produce contrary results during fever. During the monsoon season, the practitioner must choose a clear sunny day for the practise, and must restrict it to only very fine days. In case care is not taken in adhering to such observances the practitioner might end up having cough, cold or fever due to abrupt temperature changes.

Despite the numerous restrictions, rules and regulations attached to shankhaprakshalana, it is a practice which is definitely worth undertaking. At the outset it appears to be very trying. However, after catering to proper preparations are and in relaxed atmosphere and correct guidance in the course of practice, the whole process can be conducted as easily and simply like carrying out the routine everyday asana practice.

Check Your Progress

4. Who should be careful about performing sutra neti?
5. When should sutra neti be performed?
6. What is the most important rule for ensuring success of shankhaprakshalana?

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6.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. These practices are believed to cleanse the body in the process of preparation for hatha yoga. This can be compared to cleaning one's house up before decorating it.
2. In Jal Neti, water is drizzled into one nostril and it automatically comes out through the other nostril, thus, cleansing the nostrils.
3. The sinus passages can get blocked with contaminations which can become a cause of infections, swellings and pains in the nose or head. Jal Neti, therefore, is the solution provided by Hatha Yoga Pradeepika as a simple technique to keep the sinuses free of all such impurities.
4. People suffering from deviated septum, polyps, or other such nasal abnormalities must consult their ENT specialist or an experienced yoga therapist.
5. It is best to perform it soon after waking up in concurrence with the other morning cleansing activities.
6. In order to reap the true and best rewards of shankhaprakshalana, it is absolutely necessary to strictly adhere to the prescribed diet. Any deviation to the rules usually creates a disturbance, which if not seen as an immediate result may unfold at a later stage.

6.7 SUMMARY

- There are six yogic kriyas or cleansing practices in all, that is why they are known as shat-karma (six-actions). These practices are difficult to perform and require great deal of practice to master. Some people might find them even revolting or un-natural.
- These practices are believed to cleanse the body in the process of preparation for hatha yoga. This can be compared to cleaning one's house up before decorating it.
- Dhauti is the foremost and most difficult of all kriyas. There is a requirement to swallow and re-gurgitation of a fine muslin cloth or ingesting warm saline water and vomiting it out. This kriya helps in curing serious ailments of the stomach. Performance of this kriya cleanses the mouth, throat and stomach.
- Practicing Jal Neti is an effective way of maintaining good nasal hygiene, just as brushing the teeth is essential for maintaining good dental hygiene. In this technique water (generally salted) is used to cleanse and disinfect the nasal path, starting from the nostrils to the throat.

- To perform the kriya of Jala Neti the practitioner requires a Neti Pot, some salt and water. Neti pot is a tiny pot having an elongated spout on the side which can be inserted in one nostril out of the two. The neti pot could be made of copper, steel, ceramic or even plastic.
- Sutra Neti is yet another way of performing the nasal cleansing kriya. This is a very effective way of keeping the nasal cavities open and keeping the flow of air moving smoothly. Sutra Neti is carried out by inserting a cotton thread or a very thin rubber tube into one of the nostrils and then brought out through the mouth.
- Shankhaprakshalana is a very important hatha yoga practice, which comes under the banner of dhauti kriya, this is also known by the name of varisara dhauti. Dhauti denotes to 'internal washing' and vari means 'water'. Generally, the term shankhaprakshalana is applied, shankha meaning 'conch', because it resembles the stomach and intestines; prakshalana means 'cleaning'.
- Under no circumstances should shankhaprakshalana be practised alone and without proper and skilled guidance. A peaceful and tranquil surrounding under the guidance of an expert guide on hand brings about the best results.
- Despite the numerous restrictions, rules and regulations attached to shankhaprakshalana, it is a practice which is definitely worth undertaking. At the outset it appears to be very trying. However, after catering to proper preparations are and in relaxed atmosphere and correct guidance in the course of practice, the whole process can be conducted as easily and simply like carrying out the routine everyday asana practice.

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6.8 KEY WORDS

- **Shatkarma:** The term shatkarma or shatkriya denotes 'six actions.' In yoga, control of the body starts with the cleansing processes known as the kriyas, the first step to eliminate poisonous substances (toxins) accumulated in the system.
- **Jal Neti:** Jal neti is one of the six-purification procedures or 'Shatkarmas' mentioned in ancient Yoga. This technique is also used to improve breathing and removing any blockages in the nasal tract.
- **Sutra Neti:** Sutra neti is yet another way of performing the nasal cleansing kriya. Sutra Neti is carried out by inserting a cotton thread or a very thin rubber tube into one of the nostrils and then brought out through the mouth.
- **Shankhaprakshalana:** The term shankhaprakshalana is applied, shankha meaning 'conch', because it resembles the stomach and intestines; prakshalana means 'cleaning'.

6.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

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Short Answer Questions

1. List the things required for performing jal neti.
2. Identify the difference between jal neti and sutra neti.
3. List the steps involved in performing sutra neti.
4. What are the limitations and precautions for performing Shankhaprakshalana.

Long Answer Questions

1. Name and explain the six kriyas included in shatkarma.
2. Discuss the procedure and benefits of performing jal neti.
3. Explain the benefits and precautions required for performing sutra neti.
4. Establish the importance of Shankhaprakshalana in the practice of Hatha yoga.

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UNIT 7 OTHER KRIYAS OF THE HATHA YOGA

*Other Kriyas of the
Hatha Yoga*

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- 7.2 Agnisar Kriya (Enhancing the Digestive Vigour)
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- 7.6 Answers to Check Your Progress Questions
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7.0 INTRODUCTION

It is observed in nature that many animals, like tigers, spontaneously vomit food that remains undigested in the stomach, within few hours after a full meal. This is nature's mechanism to prevent formation of toxins in the body due to the accumulation of undigested food.

In the science of Ayurveda, it is said that the undigested particles of food get stuck to the stomach lining as a sticky yellowish-white substance called 'Aama'. It further moves down to the small intestine and can get absorbed into the body, creating toxins and causing diseases.

The yogic practice of Vaman Dhauti helps to clean the stomach of the unwanted food particles left over after digestion. It is practiced on an empty stomach in the early morning. It is process where the practitioner drinks large amount of saline water and vomits out the entire water, thus, flushing the stomach clean.

In this unit, you will learn about the various dhauti kriyas of Hatha Yoga.

7.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the Agnisar Kriya, including its procedure, effects and precautions
- Explain the Kunjal Kriya, including its technique and benefits
- Discuss the Gaja Kami Kriya including its technique and advantages

7.2 AGNISAR KRIYA (ENHANCING THE DIGESTIVE VIGOUR)

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Agnisara Kriya is not a part of the six chief Hatha Yoga Kriyas in the strict sense. Rather it is the earliest practice for Nauli i.e. twisting of the stomach muscles. Agnisara Kriya is a good kriya to perform for some time before beginning the practice of Nauli in order to strengthen the muscles of the abdomen.

The literal meaning of the Sanskrit word ‘Agni’ is fire and ‘Sara’ stands for wash. So, both things put together factually means to wash the fire chakra (Manipur Chakra) situated at the core of the navel. This exercise is effective in stimulating the body’s immune system, increasing digestive powers and enhancing body’s heat which burns toxins off. This kriya is particularly helpful for people suffering from diabetes.



Agnisar kriya is very beneficial for the stomach, small intestine, large intestine, liver, pancreas, gall bladder, kidney, adrenal gland, uterus and ovary, and the prostate gland. It helps in getting rid of excessive fat on the tummy. It also proves to be beneficial in curing conditions like constipation, flatulence, loss of hunger, weak intestine, disorders in the urinary area and problems related to indigestion. Agnisar kriya is particularly suggested for people who are afflicted by poor health in spite of having a good and nutritious diet. Consistently practicing Agnisar kriya proves to be helpful in addressing issues such as diabetes and obesity. It is believed that regular practice of Agnisar kriya slows down the process of ageing, thus making sure that the practitioner maintains his/her youth for a longer period of time. This practice enhances and revitalises the energy and strength of the body. By guarding against stomach ailments, Agnisar kriya keeps the practitioner fit.

The technique of Agnisar kriya

*Other Kriyas of the
Hatha Yoga*



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1. Stand firm on your feet with knees slightly bent and legs slightly apart.
2. Inhale through the nose (deeply) and exhale completely through the mouth.
3. Bend forward slightly and while bending the knees, give support to the body while placing both hands on the thighs.
4. Keep the back straight, the head upright, relax the muscles of the abdomen
5. Pull the navel inwards and upwards, try to push it back into the spine.
6. Try not to pull in from beneath the sternum.
7. Make sure that your chest does not sink and your back remains absolutely straight.
8. Remain in that position for some time.
9. Now start the kriya of snapping your abdomen forwards and backwards.
10. Repeat this action ten to fifteen times while holding your breath.
11. Just as it begins to get uncomfortable, breathe out.
12. Repeat this action three times.

In the beginning the abdominal muscles tend to get tired very fast because of the weak Agni. With daily practise, one is gradually able to increase the number of repetitions. The practitioner should feel relaxed and stimulated while performing the kriya and should also be able to feel the heat generated in the body. After passage of some time and a few repetitions, the body gains strength in the abdomen and the surrounding area and practising the kriya on a daily basis becomes easy.

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Precautions

- Agnisar kriya must be practised on an empty stomach.
- Pregnant ladies and women undergoing the menstruation cycle must avoid this kriya.
- People having undergone any abdominal surgery must not practise it soon after the surgery.
- People suffering from intestinal or pancreatic diseases must practise agnisar kriya only after consulting their doctor.

Vaman Dhauti (regurgitate cleansing)

Vaman dhouti, as a practice, can be performed in three different ways viz., kunjaj kriya, vyaghra kriya and gaja kami kriya. The word kunjaj kriya is made of two words i.e., kunjaj and kriya. Kunjal is a Sanskrit word which means elephant, and kriya stands for procedure. Kunjal kriya is best performed on an empty stomach whereas Vyaghra Kriya is practiced while there is still undigested or partially digested food in the stomach.

7.3 KUNJAL KRIYA (REGURGITATE ELEANING)

The yogic technique of Kunjal is one of the most effective yoga practices. Practitioners of this kriya are able to witness dramatic and immediate effects. It has been proven that asthmatics get immediate relief from the Kunjal kriya, and other than that sufferers of complaints like acidity, indigestion, headache, etc., are also known to have benefitted from Kunjal.

The process

1. The first and foremost step while performing Kunjal is to drink lukewarm, salty water till one feels like vomiting.
2. The water to be ingested must be tepid, and have around 1 or 2 teaspoons of salt for half a litre of water.
3. Minimum requirement is to drink at least six glasses of tepid and salty water. However, it is even better if you can drink more than that
4. The main idea is to drink up to the brink where it is not possible to take even another sip.
5. Many practitioners are able to vomit automatically at this point of time. In case this does not happen then the practitioner must insert two fingers into the throat and tickle the back of the tongue as far down as possible.
6. Pressing that portion of the tongue will create a vomiting sensation. The medical term for this sensation is known as the 'gag reflex'.

7. Once active, water will come out of the practitioner's mouth in a forceful and quick manner.
8. The practitioner must continue to press the back of the tongue so, until he/she starts feeling an emptiness in the stomach.

This kriya should be practised first thing in the morning without eating anything and should be followed by neti. After completing the kriya, the practitioner must wait minimum twenty minutes to about half an hour before eating anything. The lining of the stomach must get a chance to restructure before the digestion process of restarts and acids start pouring into the stomach again.

Precautions

People suffering from long term and serious diseases, such as stomach ulcers, hernia of the stomach, hypertension, cardiac diseases or oesophageal varices, should learn and practice kunjal only under the guidance of a qualified yoga trainer.

Kunjal and vomiting

The vomit created by Kunjal kriya does not have any unpleasant feelings generally related to vomiting, for instance nausea and bad odour. The liquid vomited out by the practitioner is generally clean and odourless. Due to the salt added to the water which is ingested in the kriya, the acid is removed and it is neutralized. This even takes away the burning sensation. Since there are no solid particles contained in the water, therefore it comes out effortlessly and quickly.

Performing kunjal a first few times may seem weird and unnatural to some people. This feeling usually creates a mental block in the mind of the practitioner. But after a few practices when the practitioner realizes that the vomit created due to the kunjal kriya is unlike a natural vomit and is not accompanied by any sickness and unpleasant feelings, the kriya becomes a pleasurable experience. One must and try to avoid passing any judgments against the kriya before actually experiencing its results. As a person starts to realise the benefits of kunjal, body starts to desire the kriya each morning. For many people kunjal kriya is as normal as brushing their teeth in the morning, without which they feel dirty. Daily practitioners of kunjal kriya hardly take any time to complete the activity every morning.

Effects of Kunjal kriya

Kunjal kriya has numerous benefits on the mind and body of the practitioner, some of these have been listed below for your benefit:

Direct impacts of Kunjal kriya

- Regular practice of kunjal kriya helps in maintaining overall good health.
- It is beneficial in overcoming many lifestyle related or other diseases like acidity; nausea, revulsion, food poisoning; gastritis; inflamed of the oesophagus, coughs, asthma, bronchitis and respiratory diseases; different

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types of headaches, like tension headaches or migraine and nervous system related diseases.

- The flushing of the entire body, untangling of knots and unblocking nerves due to kunjaj are the pranic benefits of this kriya which make the body feel revived and rejuvenated.
- At the psychological level, kunjaj can be helpful with respect to many psychological disorders or ailments. This does the job of a kind of shock therapy and ends up recharging the brain and mind. It has proven to be specifically beneficial for people suffering from problems like apathy, depression, tensions, lethargy, neuroses, anxiety and phobias.

Indirect impacts of Kunjal kriya

- One of the major indirect effects of kunjaj is that it tones up and aids in rebalancing the nervous system, which in turn rejuvenates the entire body.
- The release of energy caused due to the pranic flush aids in toning up the circulatory system, the respiratory system, the urino-genital system and the musculoskeletal system.
- All systems of the body are ultimately interdependent on each other for maintaining a correct balance and smooth operation of the body. For instance, in cases where one system, like the digestive system, begins to overspill with energy, this energy falls into the other sections body and recharges them.
- For effective human existence, the body and the mind have to work together in harmony as one unit. So, recharging of the body automatically recharges the mind. This is how kunjaj kriya is helpful in curing psychological diseases using physical techniques. This norm is applicable to all yogic procedures and methods which are a cause of filling our lives with positive energy.

Effects of Kunjal kriya on the body

The act of kunjaj kriya stimulates the physical channels of a human being's nervous system, which is responsible for sending signals to the brain. Thus in turn a signal is sent down to the motor system induce vomit in the body: there is contraction of the stomach, diaphragm and glottis, which causes the water to move in the opposite direction.

Three processes in the body viz., orgasm, sneezing and vomiting totally paralyse the brain and mind for an instant, leaving the person in a state of selflessness, this is suggestive of a meditative state. Looking back and reflecting upon any one of these experiences, one can understand and recollect that at the instant while undergoing one of these states, there was wave of energy which rushed through one's body and mind which temporarily immobilised all thought and action.

While experiencing this rush of energy the brain is in a state of utmost stimulation. A lot of its connections are momentarily cut, barring just a few most essential circuits in action. This situation can be compared to, but is far gentler than the electric shock therapy (ECT). The ECT is used by many therapists and mental hospitals for the treating patients suffering from depression. ECT floods electric energy into the brain, but in the case of kunjaj, each nerve of brain is filled with pranic energy. This energy gives life to and invigorates every cell. After the energy diminishes, all circuits of the brain restart and start to function in a more synchronised manner.

After this process, energy from the brain is poured out into the rest of the body through the nerves. This additional energy cleanses and decontaminates by invigorating the cells of the waste-disposal system, and then moves on to the other parts of the body. This entire exercise results in a direct upsurge in efficiency of the body.

When the practitioner does kunjaj kriya, the energy flow starting from the stomach on the physical level, and manipura chakra on the psychic level, arouses the vagus nerve together in its sensory and motor roles. The vagus is sensory to the heart, lungs, bronchi, trachea, pharynx and digestive tract; and motor to the heart, lungs, bronchi and digestive tract. It nourishes straight into the hypothalamus in the brain through its parasympathetic fibres. The hypothalamus manipulates the entire autonomic nervous system. The vagus is in charge of the gag reflex and vomiting.

The additional energy from kunjaj manifests into both sympathetic and parasympathetic systems, but because the mind is prepared to vomit (considered a stressful situation), the sympathetic prevails. This has these results on various systems of the body:

- Digestive system: reduced peristalsis and enhanced glucose pumped to the blood from the liver.
- Lungs: expansion of the bronchi; helpful in stopping severe asthma.
- Salivary glands begin to secrete and which results in their flushing out and cleaning.
- The heart rate increases, making the heart beat faster. The blood vessels dilate due to this which gives more oxygen to muscle of the heart.
- Mouth, sinuses and lower respiratory tract start to produce enhanced mucus secretions which results in rinsing out these areas.
- The brain also experiences a temporary blood rush which results in an increased oxygen supply and better performance.

Pranic effects of Kunjal kriya

The manipura chakra governs the stomach and digestion in the body. This is the psychic core in which prana, the life-giving power of man, is deposited. This power

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has been named bioplasma by the scientists investigating Kirlian photography and parapsychology, and is an established and recognized object. Kunjal aids in releasing prana which provides energy to the body. In effect, prana is the foundation for all energies of the body and therefore is crucial for the well-being of a human being.

With the prana flows, the energy in all nerves, this is how each cell existing in the human body and mind becomes invigorated by prana. It reinforces the feeling of being alive and happy. After completing kunjal kriya the practitioner experiences a kind of purification. He/she experiences, a rinsed, cleansed and calm feeling, which invigorates a person.

The gag reflex technique

The gag reflex which is responsible for initiating vomiting is on its own is a powerful and valued tool. People who do not have the time to perform Kunjal kriya every morning could make use of the gag reflex to rouse prana in a simple and effective manner.

This can be easily performed while brushing one's teeth in the morning. The practitioner could make use of his/her first two fingers of the hand in order to clean their tongue. They could massage the tongue by moving the finger back and forth. The practitioner should not hesitate when they reach the hind part of the tongue, taking the fingers a little deep into the throat and continuing to massage even while feeling nauseous. It is beneficial for the practitioner if he throws up, as it only means that there was undigested food in the stomach which should have come out.

The practice of Kunjal kriya

Following is the way of integrating kunjal into one's day to day life:

- After getting up each morning and clearing the stomach the practitioner must perform the kunjal kriya followed by neti.
- After both practices the practitioner must look inwards for a few minutes and realize the positivity created by kunjal and neti.
- Regular asanas must be performed in the daily routine after performing the kunjal kriya. Performing asanas after the kriya become easier as this activity awakens the body by enhancing the flow of prana all across the body and mind. It also leads to better and enhanced meditation.

Check Your Progress

1. When is the agnisara kriya performed?
2. Why is agnisara kriya useful?
3. Name the three different ways of performing vaman dhouti.
4. Who all would benefit from Kunjal kriya?

7.4 VYAGHRA KRIYA (TIGER PRACTICE)

Vyaghra kriya is another variant of the kunjla kriya. It is very beneficial in curing digestive disorders, for instance, chronic dyspepsia or indigestion, which is a common problem for many urban citizens.

The practices of kunjla and vyaghra kriyas form a part of the shared title of vaman dhauti. Vyaghra is known by the name of vaman anna dhauti. 'Anna' means food and 'vaman' means vomiting. It is also called baghi kriya and vyagra karma kriya. Both 'vyagra' and 'baghi' refer to tiger. That is why this procedure is referred to as the tiger action of vomiting. What makes it different from kunjla is that it is practised three hours after taking a meal, whereas Kunjal is performed on an empty stomach. That is the reason why during this kriya a lot of semi-digested and undigested food is expelled along with water from the stomach.

Animals like the tiger, dog, monkey, the cow, etc. have been known to vomit. The tiger fills itself with its prey, it eats away the flesh and bones alike, and then vomit out the leftovers of his diet from the stomach some 3 to 4 hours later. Dogs and cats have been observed to make use of this practice when they ingest something which does not agree with their system. They vomit out the toxins after eating grass as an emetic and cleanse their system. Therefore it can be safely said that there is nothing unnatural about this technique, and just as in case of many other yogic practices, this too has been inspired directly by the actions of animals.

The early yogic practitioners perceived this habit of the tiger as a sensible one and hence included into their lives for their benefit. They carried on with the usual ingestion of their food and then expelled the undigested portions of it from their body, three hours later. This kept most intestinal diseases and discomforts at bay, and provided them with the strength to direct their energies towards more useful commitments.

The technique of Vyaghra kriya

- Vyaghra kriya is performed in the identical manner as Kunjal kriya. The only difference is that it is done after 3 to 4 hours of eating food. While performing this kriya also, like the Kunjal kriya, the practitioner is expected to drink six glasses or more glasses of tepid saline water in quick succession.
- After drinking water (if not wanting to vomit naturally) the practitioner must immediately bend forward and induce his middle and index fingers of his hand down the throat and try to reach as far as possible. The nails of the fingers must be short and clean. The practitioner must massage and press the back of the tongue, which will stimulate an impulse to vomit.
- The vomiting should be carried out twice or thrice or more till finally only pure water is thrown out which is an indication of the stomach being perfectly clean.

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- The practitioner must be careful that while performing Vyaghra kriya no food particles enter the nose. It is best to do neti kriya immediately after Vyaghra kriya so that the entire nasal cavity can be cleansed of all impurities.
- People having problems like active stomach ulcers, hernia, heart problems or high blood pressure should not try to attempt vyaghra kriya.

It is worth mentioning here that Kunjal kriya can be performed on a daily basis, regardless of the practitioner's physical condition, but vyaghra kriya must be practised only when absolutely necessary.

Physiological benefits of Vyaghra kriya

- Performance of Vyaghra kriya restores the feeling of agility and reinforces energy into the body after a heavy meal. It removes the kind of a food that has not agreed with the digestive system, thus making the practitioner feel light and energetic.
- Undigested food creates nausea and discomfort in the system, Vyaghra removes the that burden from the body.
- It is even helpful in getting rid of chronic conditions of indigestion and acidity which are common concerns of people today.
- It removes harmful toxins from the body.
- Routine practice of Vyaghra kriya reduces complications related to the lungs like cough and breathing issues. It is beneficial for asthma patients and people suffering from chest problems.
- It is beneficial in cases of biliousness, where bile goes in the stomach and causes nausea.

Psychological benefits of Vyaghra kriya

- The knowledge of being able to practice the Vyaghra kriya eases the minds of people suffering from chronic indigestion and heartburn. They are able to eat with a relaxed mind and enjoy to their heart's content.
- Removal of the fear of indigestion, make the world appear brighter and lighter. Hence the quality of life improves.

Pranic benefits of Vyaghra kriya

- The body needs very less amount of energy or prana to digest pure foods.
- Since Vyaghra kriya removes undigested food from the body, hence there is no need for the body to expend extra energy for this purpose.
- The energy thus saved is used by the body in allowing the prana to invigorate the brain and other systems of the body.
- Regular practice of Vyaghra kriya thus reduces lethargy after a meal and keeps the body fit and active throughout the day.

7.5 GAJA KARNI KRIYA (ELEPHANT ACTION)

*Other Kriyas of the
Hatha Yoga*



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The Gaja karni kriya has been taken from the actions of elephants who make use of this process, during illness. That is the reason why it is called Gaja karni or Kunjal kriya. Actually the word Kunjal or Gaja are Sanskrit words for Elephant. Ancient yogis were inspired by elephants to perform this kriya.

The technique of Gajakarni kriya

- Water is heated till it is slightly warm and a little salt is added and filtered.
- This kriya is done while squatting on one's feet.
- After placing oneself comfortably and firmly on one's feet the practitioner drinks salt water mixture till his/her stomach bloats.
- The practitioner may stand up in between and drink some more water if required.
- After this he/she must bend the waist front and back, left and right and rotate it clockwise and anti-clockwise directions a few times in order to move the water throughout the stomach.
- This movement of the practitioner induces all toxins acids, gases and other wastes accumulated in the stomach to mix with the saline water ingested by him.
- The practitioner must now bend, press the stomach with the left hand and massage lightly and apply light pressure to the inner tongue with the two right pointed fingers.
- The sensation created by the gestures of the hand, gushes out the water in the stomach like a spring or fountain from the mouth forcing all wastes and toxins accumulated in the stomach to also gush out.
- Tickling of the inner tongue must be repeated till the entire drunk water is vomited out. Remaining water is generally excreted by the body by way of stool or urine.

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Saline water changes its colour into red when mixed with toxins and acids. Thus the practitioner must not get scared on seeing water and must not think it to be blood. It is advised to take some warm milk after completing the process, followed by some rest. The practitioner must abstain from fried or spicy food on the day of performing gaja karni kriya. Non-vegetarian food must also be avoided. Gaja karni kriya must be repeated once every week in order to keep the system healthy and happy.

People suffering from hypertension must make use of lime juice in place of salt. People suffering from ulcers, heart diseases or any other stomach ailments and pregnant women must avoid attempting gajakarni kriya.

Advantages of Gaja karni kriya

- It cleanses the stomach.
- It relieves gastric trouble, constipation, indigestion, acidity, heartburn, headache etc.
- It helps in weight reduction.
- It helpful in keeping jaundice away.
- It helps in relieving breathing problems.

Check Your Progress

5. What is the main use of Vyaghra kriya?
6. Where was the name of Gajani Kami kriya derived from?
7. Who should avoid the Gajani Kami kriya?

7.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Agnisara Kriya is not a part of the six chief Hatha Yoga Kriyas in the strict sense. Rather it is the earliest practice for Nauli i.e., twisting of the stomach muscles.
2. Agnisara Kriya is effective in stimulating the body's immune system, increasing digestive powers and enhancing body's heat which burns toxins off. This kriya is particularly helpful for people suffering from diabetes.
3. Vaman dhouti, as a practice, can be performed in three different ways viz., kunjaj kriya, vyaghra kriya and gaja karma kriya.
4. It has been proven that asthmatics get immediate relief from the Kunjal kriya, and other than that sufferers of complaints like acidity, indigestion, headache, etc., are also known to have benefitted from Kunjal.

5. Vyaghra kriya is another variant of the kunjal kriya. It is very beneficial in curing digestive disorders, for instance, chronic dyspepsia or indigestion, which is a common problem for many urban citizens.
6. The Gaja karni kriya has been taken from the actions of elephants who make use of this process, during illness. That is the reason why it is called Gajakarni or Kunjal kriya. Actually, the word Kunjal or Gaja are Sanskrit words for elephant.
7. People suffering from hypertension must make use of lime juice in place of salt. People suffering from ulcers, heart diseases or any other stomach ailments and pregnant women must avoid attempting Gaja karni kriya.

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7.7 SUMMARY

- Agnisara Kriya is not a part of the six chief Hatha Yoga Kriyas in the strict sense. Rather it is the earliest practice for Nauli i.e. twisting of the stomach muscles. Agnisara Kriya is a good kriya to perform for some time before beginning the practice of Nauli in order to strengthen the muscles of the abdomen.
- Agnisar kriya is very beneficial for the stomach, small intestine, large intestine, liver, pancreas, gall bladder, kidney, adrenal gland, uterus and ovary, and the prostate gland. It helps in getting rid of excessive fat on the tummy. It also proves to be beneficial in curing conditions like constipation, flatulence, loss of hunger, weak intestine, disorders in the urinary area and problems related to indigestion.
- Vaman dhouti, as a practice, can be performed in three different ways viz., kunjal kriya, vyaghra kriya and gaja karma kriya. The word kunjal kriya is made of two words i.e., kunjal and kriya. Kunjal is a Sanskrit word which means elephant, and kriya stands for procedure.
- Kunjal kriya should be practised first thing in the morning without eating anything and should be followed by neti. After completing the kriya, the practitioner must wait minimum twenty minutes to about half an hour before eating anything.
- Three processes in the body viz., orgasm, sneezing and vomiting totally paralyse the brain and mind for an instant, leaving the person in a state of selflessness, this is suggestive of a meditative state.
- When the practitioner does kunjal kriya, the energy flow starting from the stomach on the physical level, and manipura chakra on the psychic level, arouses the vagus nerve together in its sensory and motor roles.
- Vyaghra kriya is another variant of the kunjal kriya. It is very beneficial in curing digestive disorders, for instance, chronic dyspepsia or indigestion, which is a common problem for many urban citizens. The practices of kunjal

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and vyaghra kriyas form a part of the shared title of vaman dhauti. Vyaghra is known by the name of vaman anna dhauti. 'Anna' means food and 'vaman' means vomiting.

- The Gajakarni kriya has been taken from the actions of elephants who make use of this process, during illness. That is the reason why it is called Gajakarni or Kunjal kriya. Actually, the word Kunjal or Gaja are Sanskrit words for Elephant. Ancient yogis were inspired by elephants to perform this kriya.
- Saline water changes its colour into red when mixed with toxins and acids. Thus, the practitioner must not get scared on seeing water and must not think it to be blood. It is advised to take some warm milk after completing the process, followed by some rest.

7.8 KEY WORDS

- **Agnisara kriya:** The literal meaning of the Sanskrit word 'Agni' is fire and 'Sara' stands for wash. So, both things put together factually means to wash the fire chakra (Manipur Chakra) situated at the core of the navel.
- **Kunjal Kriya:** The word kunjal kriya is made of two words i.e., kunjal and kriya. Kunjal is a Sanskrit word which means elephant and kriya stands for procedure.
- **Vyaghra Kriya:** Vyaghra kriya is another variant of the kunjal kriya. Vyaghra is known by the name of vaman anna dhauti. 'Anna' means food and 'vaman' means vomiting.
- **Gaja Karni kriya:** The Gaja Karni kriya has been taken from the actions of elephants who make use of this process, during illness. That is the reason why it is called Gaja karni or Kunjal kriya.

7.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is the significance of the Agnisara kriya?
2. Write a short note on vaman dhauti.
3. What is Vyaghra kriya? How is it different from Kunjal kriya?
4. List the advantages of Gaja Karni kriya.

Long Answer Questions

1. Discuss the steps and technique of the Agnisara kriya in detail. Also outline the precautions that one needs to take, while practising the kriya.
2. Explain the process and effects of Kunjal kriya.
3. Discuss the technique and physiological benefits of Vyaghra kriya.
4. Outline the technique of Gaja Karni kriya.

*Other Kriyas of the
Hatha Yoga*

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7.10 FURTHER READINGS

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UNIT 8 VARIOUS DHAUTI KRIYAS

NOTES

Structure

- 8.0 Introduction
- 8.1 Objectives
- 8.2 Vastra Dhauti (Cleansing the Intestines with Air)
- 8.3 Nauli Kriya (AB DO Minal Massaging)
- 8.4 Madhyama Nauli Kriya (central AB DO Minal Contraction)
 - 8.4.1 Vama Nauli Kriya
 - 8.4.2 Dakshina Nauli Kriya
- 8.5 Answers to Check Your Progress Questions
- 8.6 Summary
- 8.7 Key Words
- 8.8 Self Assessment Questions and Exercises
- 8.9 Further Readings

8.0 INTRODUCTION

Dhauti is an important part of the Shatkarma (also known as Shatkriya), the body cleansing techniques. The main aim of Dhauti is to clean the digestive tract in its full length but it affects also the respiratory tract, external ears and eyes. According to Gheranda Samhita, it is divided into four parts: Antar (internal) dhauti, Danta (teeth) dhauti, Hrid (cardiac or chest region) dhauti and Moola shodhana (rectal cleansing).

8.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the technique of Vastra Dhauti and its benefits
- Discuss Nauli Kriya, including its benefits and technique
- Identify the steps and benefits of Madhyama Nauli, Vama Nauli and Dakshina Nauli Kriya

8.2 VASTRA DHAUTI (CLEANSING THE INTESTINES WITH AIR)

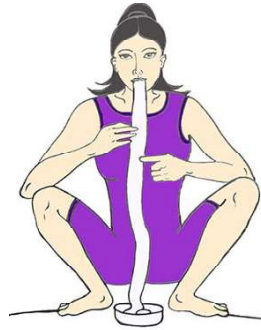
Vastra dhauti is a yogic kriya which is performed using a clean and hygienic cotton cloth. The cloth must be of the specification of five inches in width and seven meters in length. It must be smooth and free of all contamination. The cut sides of the cloth must be stitched up in order to avoid any strands being left in the stomach.

In order to cater to the adequate specifications of the cloth it must be one inch extra on both the sides.

Vastra dhauti is an internal cleaning method in which the intestines are cleansed using air. This practice can be performed at any time of the day, but, it is best to carry it out before consumption of a main meal. It should never be performed during or after a meal. It is good enough to practice this kriya one or two times in a week.

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VASTRA DHAUTI SHATKARMA for CLEANING STOMACH



Process of performing Vastra dhauti kriya

1. Boil water for a few minutes.
2. Soak the cloth into boiling water and let it boil for some time.
3. New practitioners may add milk or honey to water the boiling water in order to smoothen the cloth so that it can be swallowed easily.
4. In order to do the kriya properly, the practitioner must sit on his/her feet on the ground.
5. The container with water and cloth must be kept in front, on the ground and between the legs.
6. The practitioner must pick up one end of the cloth and keep it on the tongue and make an effort to take it inside slowly.
7. The practitioner could take a sip of water on the tip of the cloth reaching the throat in order to smoothen the further downward movement of the cloth.
8. The practitioner must try and take in the entire length of the cloth in this manner.
9. There might be some fear or nervousness in the mind initially, but one must try to overcome it.
10. The process of swallowing the cloth must be slow and just a portion of the length must be ingested every day, gradually increasing it.
11. On first day the practitioner must try and take just one inch of the cloth, on the second day one foot, on the third two feet and so on.

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12. The progress can gradually increase with practice each day.
13. The practitioner should not make the mistake of trying to complete the entire process on the very first day.
14. The day the practitioner is confident enough to swallow the entire cloth, he/she must do so and practice nauli kriya (if he/she knows how to do it). After that, take out the cloth slowly.

The practitioner must be careful to take out the cloth within ten minutes. There might be some complications in case the cloth remains in for a longer period of time e.g., it might get stuck while removing. In such a scenario the practitioner should pull the cloth with force. Drinking some water in order to lubricate the cloth might also help in its free movement. This kriya must always be performed under the supervision of experts till the practitioner himself or herself does not become an expert.

Precautions to be observed

- The practitioner must always keep some clean drinking water close by while practising this kriya.
- The must should be slowly swallowed and should never be chewed.
- In case of the cloth getting stuck, no use of force should be made to remove it, rather the practitioner should take some water to lubricate it.
- In such a case, more cloth should be swallowed this will help in removal of the stuck cloth easily.
- Keeping the cloth clean and hygienic it must be washed thoroughly with soap and dipped in hot salt. This will cleanse it of any bacteria stuck to it. After that the cloth must be then be thoroughly washed in clean water and dried in direct sun.
- This kriya should never be practiced without expert supervision.

Advantages of Vastra dhauti kriya

- The cloth used in vastra dhauti kriya has the potential to clean the lining of the stomach efficiently thus promoting the secretion of digestive enzymes.
- The technique of Vastra dhauti kriya proves to be very beneficial for people having problems like mucus, phlegm or breathing disorders.
- Vastra dhauti kriya also has the potential to cure stomach ulcers.
- It is also helpful in dealing with skin problems.
- The natural process of burping brings a sense of relief as the action of swallowing food also inadvertently includes swallowing air each mouthful. The air thus swallowed gets collected in the stomach. Some of this air also passes into the intestinal tract but most of it expelled by burping. Vatsara dhauti kriya is also based on the same principle of burping, but rather than

inducing air into the stomach by taking in food, air is induced into the stomach by deliberate effort. In other words, air is sucked into the stomach while inhaling.

- The practice of vastra dhauti helps in clearing the stomach of decayed, dirty smelling gases.
- Due to liberal supply of oxygen in the stomach through the cloth, the digestion process becomes more effective. The oxygen induced into the stomach encourages the best possible digestion of food.
- Vastra dhauti kriya enhances the body's digestive power and thus improving the chemical reactions that take place inside the abdomen.
- It is helpful in removal of contaminated and undesirable gases and helps in elimination of hyper-acidity and indigestion.
- Vastra dhauti is a very effective tool in countering numerous diseases arising from digestive disorders.

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8.3 NAULI KRIYA (AB DO MINAL MASSAGING)

“Lower the shoulders. Revolve the stomach left and right with the speed of a strong whirlpool. This is called Nauli by the masters. This Nauli is the crown of Hatha practices. It kindles a weak gastric fire, restores the digestion, always brings happiness, and dries up all defects and diseases.”

— From **The Hatha Yoga Pradipika**, translation by Brian Dana Akers

Nauli is a yogic exercise or kriya used to cleanse the internal organs of the body and toning the abdominal area by way of a side-to-side rolling motion of the muscles present in the abdomen.

The practice of nauli is not very popular in the modern practice of yoga. Practitioners of classical yogic traditions were ardent practitioners of this kriya and in fact, it used to be one of the foremost kriyas taught to beginners. Even before teaching them how to perform any asanas. This gave the yoga student the liberty and comfort of using Uddiyana bandha and nauli movements while exercising the practice of their asanas. It also enhanced awareness and energy levels to their practice of asanas.

Nauli as a yogic technique massages all abdominal organs like: the stomach, the liver, spleen, urinary bladder, pancreas, gall bladder and the intestines. This kriya aids in maintaining good health of the lower organs.

The secret to becoming a perfect Nauli practitioner is to nurture the ability to separate rectus abdominis muscle also known as the ‘abs’ muscle in the abdomen. These muscles are present on both sides of the abdomen. They run vertically and parallel all across from the lower ribs on the top to the pubic region at the bottom.

The practice of Nauli kriya

The essential actions performed by the abdominal muscles in order to achieve nauli need basic four movements. Uddiyana bandha is a prerequisite of nauli kriya.

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The mandatory steps to practice nauli kriya are as follows:

- **Uddiyana bandha:** This an abdominal lock achieved by emptying out the lungs and pulling the abdomen towards the back and inwards and up under the rib cage
- **Madhyana nauli (central nauli):** This is the practice of an isolated contraction of the central muscles of the abdomen.
- **Vama nauli (left side nauli):** This is the practice of an isolated contraction of the left side of the muscles of the abdomen.
- **Daksina nauli (right side nauli):** This is the practice of an isolated contraction of the right side of the muscles of the abdomen.

Check Your Progress

1. Define the ideal measurement of cloth to be used for vastra dhauti.
2. How long should the cloth be kept inserted through the mouth ideally?
3. What is the purpose of nauli technique?

8.4 MADHYAMA NAULI KRIYA (CENTRAL ABDOMINAL CONTRACTION)

Madhyama Nauli is the practice of flexing the middle muscles of the core. While performing this kriya the central muscles of the abdomen are pulled together and the middle group of muscles juts out, this is known as the madhyama nauli.

Practice of Madhyama Nauli kriya

Madhyama nauli Kriya is the practice of tightening and segregating the muscles of the rectus abdominal. The Sanskrit word 'Nala' refers to the 'navel string' which means the rectus abdominal muscles. It also stands for a tubular vessel.

It is important to maintain the Uddiyana bandh while performing the nauli kriya. The way to perform the kriya is to push the point in the abdomen just above the pelvic bone in the midline forward and downward. This is the place where the two recti originate. Pushing this part of the abdomen so, brings about the tightening of these muscles which jut out in the middle, the adjoining side muscles of the wall of the abdomen remain relaxed.

NAULI ABDOMINAL CHURNING

Various Dhauti Kriyas



Fig 8.1 Nauli (Abdominal Churning) Kriya

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The process of performing Madhya nauli kriya

- The practitioner must stand with feet apart, knees must be bent and hands placed firmly on the thighs, in order to give support to the body.
- Take inhale deeply and then exhale forcefully while emitting a hissing sound.
- Contract the stomach inwards and upwards (towards the sternum). Which means practice the *Uddiyana Bandha*. This position is the foundation for performing all the *Nauli* kriyas.
- Now practitioner must hold his/her breath and try to separate the two 'abs' *rectus abdominis* muscles and push them towards the centre. This step does not involve any breathing. The breathing is halted with the exhalation (this is known as *Bahya Kumbhaka* in Yoga). Beginners may find this position a little difficult in the beginning as it requires practice. The chief trouble is in separating the 'abs' muscles. After that the practitioner has to deliberate and position it in the centre for few seconds at least. This action entails a lot of practice by the practitioner.
- The practitioner must now inhale and let go of the position and stand up fully. This process must be repeated after a few deep natural breaths.

The process of Madhya nauli kriya must be repeated, based on the capacity and stamina of the practitioner. This kriya takes a lot of effort and time to perfect hence the practitioner must be very patient and consistent with his/her efforts.

8.4.1 Vama Nauli kriya



Fig 8.2 Vama Nauli Kriya

The process of performing Vama nauli

Vama nauli kriya is performed taking the same stance as done while performing the Madhya nauli kriya. The first three are the same as Madhya nauli kriya practice.

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The rest is as follows:

- After exhaling and performing the *Bahya Kumbhaka*, the practitioner must observe the *Vama Nauli kriya*.
- In *Vama Nauli* kriya the left 'abs' muscles *rectus abdominis* muscles are separated and pushed to the fore. This push of the left side of the abdomen will create a cavity in the right side and a muscle projection on the left side. The practitioner must maintain this position for few seconds.
- After this the practitioner must inhale and release the position and stand up straight.
- The process of *Vama* nauli kriya must be repeated, based on the capacity and stamina of the practitioner.

8.4.2 Dakshina Nauli kriya



Fig 8.3 Dakshina Nauli Kriya

The process of performing Dakshina nauli kriya

- The procedure to perform the Dakshina nauli kriya is the same as the one followed during the practice of *Vama nauli kriya*.
- In the former, instead of separating the left 'abs' muscles, the right 'abs' muscles are contracted and separated.

After obtaining expertise over all three types of *nauli kriyas*, the practitioner can even try to rotate the *abdominis* muscles in the clockwise and anti-clockwise directions. This seems like a churning motion of the *abdominis* muscles from the right to left and from the left to right. This powerful technique helps in absolute toning of the *abdominis* organs of the viz., stomach, large and small intestines, liver, spleen, pancreas, kidneys, etc. All these different parts of the abdomen get a good massage.

Benefits of Nauli Kriya

- *Nauli* kriya massages all the internal abdominal organs and keeps them healthy.
- *Nauli* is a very effective way of relieving constipation.
- *Nauli* kriya fortifies the working of the sexual organs
- Nauli Kriya is beneficial for all internal organs of the abdomen and pelvis for instance large and small intestines, kidneys, stomach, liver, bowel, pancreas, and reproductive organs.
- Nauli gives relief from problems like indigestion, diarrhoea, acidity, flatulence, despair, imbalance of the hormones, sexual and urinary ailments, diabetes, lack of energy, psychological disturbances, etc.
- Nauli massages and tones up entire abdominal area
- Nauli arouses and cleanses, Manipura chakra, the warehouse of prana.
- It aids in enhancing mental clarity and power as it harmonizes the flow of energy in the body.
- Nauli helps administer control over the appetite, sensual desires, strength, and willpower.
- Regular practice of nauli kriya brings deeper satisfaction within the practitioner.

Precautions for Nauli kriya

Nauli kriya can be learnt and practiced by people of any age, yet, since it is a powerful action and may be a cause of some kind of discomfort, or maybe, slight injury. It is always advisable to learn and practice the nauli from an experienced yoga trainer.

Nauli kriya should not be performed by pregnant women, or people suffering from and kind of hernia, blood pressure problems, heart ailments, ulcers, or any indigestion problems. In case of any kind of pain during the performance of nauli, the practitioner must stop and give the body some rest. In case of persistent pain while performance of the kriya, expert advice must be sought immediately.

Check Your Progress

4. How is nauli kriya performed?
5. How do techniques of dakshina nauli kriya and vama nauli kriya differ?

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8.5 ANSWERS TO CHECK YOUR PROGRESS

1. The cloth must be of the specification of five inches in width and seven meters in length.
2. The practitioner must be careful to take out the cloth within ten minutes.
3. Nauli as a yogic technique massages all abdominal organs like: the stomach, the liver, spleen, urinary bladder, pancreas, gall bladder and the intestines. This kriya aids in maintaining good health of the lower organs.
4. The way to perform the kriya is to push the point in the abdomen just above the pelvic bone in the midline forward and downward. This is the place where the two recti originate. Pushing this part of the abdomen so, brings about the tightening of these muscles which jut out in the middle, the adjoining side muscles of the wall of the abdomen remain relaxed.
5. The procedure to perform the Dakshina nauli kriya is the same as the one followed during the practice of *Vama nauli kriya*. In the former, instead of separating the left 'abs' muscles, the right 'abs' muscles are contracted and separated.

8.6 SUMMARY

- Vastra dhauti is a yogic kriya which is performed using a clean and hygienic cotton cloth. The cloth must be of the specification of five inches in width and seven meters in length. It must be smooth and free of all contamination. The cut sides of the cloth must be stitched up in order to avoid any strands being left in the stomach.
- The practitioner must be careful to take out the cloth within ten minutes. There might be some complications in case the cloth remains in for a longer period of time e.g., it might get stuck while removing.
- Nauli is a yogic exercise or kriya used to cleanse the internal organs of the body and toning the abdominal area by way of a side-to-side rolling motion of the muscles present in the abdomen.
- The practice of nauli is not very popular in the modern practice of yoga. Practitioners of classical yogic traditions were ardent practitioners of this kriya and in fact, it used to be one of the foremost kriyas taught to beginners.
- Madhyama Nauli is the practice of flexing the middle muscles of the core. While performing this kriya the central muscles of the abdomen are pulled together and the middle group of muscles juts out, this is known as the madhyama nauli.

- It is important to maintain the Uddiyana bandh while performing the nauli kriya. The way to perform the kriya is to push the point in the abdomen just above the pelvic bone in the midline forward and downward.
- Vama nauli kriya is performed taking the same stance as done while performing the Madhya nauli kriya. The first three are the same as Madhya nauli kriya practice.
- After obtaining expertise over all three types of *nauli kriyas*, the practitioner can even try to rotate the *abdominis* muscles in the clockwise and anti-clockwise directions. This seems like a churning motion of the *abdominis* muscles from the right to left and from the left to right.
- Nauli kriya can be learnt and practiced by people of any age, yet, since it is a powerful action and may be a cause of some kind of discomfort, or maybe, slight injury. It is always advisable to learn and practice the nauli from an experienced yoga trainer.

NOTES

8.7 KEY WORDS

- **Vastra dhauti:** Vastra dhauti is a yogic kriya which is performed using a clean and hygienic cotton cloth.
- **Nauli:** It is a yogic exercise or kriya used to cleanse the internal organs of the body and toning the abdominal area by way of a side-to-side rolling motion of the muscles present in the abdomen.
- **Madhyama Nauli:** Madhyama nauli is the practice of flexing the middle muscles of the core.

8.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. When should the vastra dhauti be performed and why?
2. Write any four advantages of vastra dhauti.
3. What is the secret to performing Nauli.

Long Answer Questions

1. Explain the procedure for performing vastra dhauti and also outline the precautions that must be taken.
2. Examine importance of Nauli kriya and essential steps for performing the kriya.
3. Discuss the practice of Madhyama Nauli kriya.

8.9 FURTHER READINGS

NOTES

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BLOCK - III
YOGIC PRACTICES

*Basti, Kapalbhata
and Trataka*

NOTES

**UNIT 9 BASTI, KAPALBHATI
AND TRATAKA**

Structure

- 9.0 Introduction
- 9.1 Objectives
- 9.2 Benefits of Basti
 - 9.2.1 Jala Basti
 - 9.2.2 Sthal Basti
- 9.3 Moola Shodhana
- 9.4 Vyutkrama Kapalbhata
- 9.5 Sheetkrama Kapalbhata
- 9.6 Trataka
- 9.7 Answers to Check Your Progress Questions
- 9.8 Summary
- 9.9 Key Words
- 9.10 Self-Assessment Questions and Exercises
- 9.11 Further Readings

9.0 INTRODUCTION

Basti is a Sanskrit term which generally refers to everything connected with lower parts of the body namely the abdomen, pelvis and the bladder. It is sometimes referred as 'vasti' or 'wasti'. The process of cleansing the lower part of the abdomen particularly the colon is referred as practicing of basti in yogic practices. Basti can be practiced on dry ground as well as in water. The technique of practicing on dry ground is known as sthala basti and when performed with water it is known as Jala basti. Another practice is suksha basti, meaning dry and it is also referred to as vata basti. In this practice the colon is cleansed while air is sucked into the body. The practice is not done using any form of tube or catheter. The term 'jala' denotes 'water' therefore it is referred as Jala basti. In this practice water is sucked into the anus, the practice is also referred as 'vati basti'. The method used in sthala as well as jala basti is similar, with just one difference that as the word suggests, sthala is performed on dry ground using the air whereas the other is performed using water.

Besides the types of Basti (Yogic Enema) and its benefits, you will also learn about Moola Shodhana, Kapalbhata and Trataka in this unit.

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9.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe the ways of performing Basti and the associated benefits of Basti
- Explain the significance of Moola Shodhana
- List the advantages of Vyutkrama Kapalbhata and Sheetkrama Kapalbhata
- Evaluate the importance of Trataka and how it helps the human body

9.2 BENEFITS OF BASTI

The manual on hatha yoga, the 'Hatha Yoga Pradipika' has listed many advantages of the Basti practice. Some of the benefits of Basti are as follows:

- The practice helps in eliminating all disorders that occur due to excessive air, bile and mucus.
- It also helps in repairing enlarged glands and spleen.
- Jala basti helps in increasing the appetite.
- The practice of basti helps in adding glow on the skin.
- There is purification of blood which helps in eliminating doshas. All the toxins are flushed out of the body.
- It helps in cleansing of mind and senses.
- The practice helps in cleansing the bowel by removing all the extra bacteria, residue of the stool, thread worms if any. Basti helps in removing the heat from the intestines' lower portion as well.
- Helps in pushing apana vayu towards the upper parts of the body, the rising of the apana is realised through the navel as the pressure increases in the abdomen.
- Basti helps in curing disorders in the digestive system such as constipation, controls diarrhoea occurring due to nervousness. It provides strength to solar plexus. The muscle tone and blood supply is improved as well.
- The practice should not be performed by individuals suffering from ailments like high blood pressure, hernia or digestive disorders. Basti helps in curing disorders like dysentery and colitis, although it is recommended to take medical advice in case any person is suffering from above mentioned disorders so that there are no serious repercussions.

9.2.1 Jala Basti

In the absence of a source of water such as river or lake the practice of jala basti may be done with a bucket of water. Individuals starting the practise, first have to insert a 0.8 diameter tube into the rectum. Initially, the practice was done using a

bamboo tube. In present times plastic tubes are used quite often although it is recommended to use material made up of natural products. The length of the tube needs to be thirteen to fifteen centimetres minimum and it should not be rough or uneven. It is advised to use lubricating substances like beeswax or other soothing substances. The tube may be lubricated with the help of clarified butter or petroleum jelly, these do not cause irritation.

The tube has to be inserted at least four centimetres into the passage of the anus, then the individual needs to sit in utkatasana (a squatting position) above the bucket. While exhaling the uddiyana bandha has to be performed. In case if one is not capable to suck the water in the bowel, using the tube at that time the individual should do madhyama nauli and hold the position. Even if this does not help in sucking the water then vama or dakshina nauli may be performed. Once the individual is not able to hold kumbhaka any longer in that case the tube should be removed while holding the breath. Come into the standing position and breath should be realised through the nose gradually. While expelling the water it is advisable to be positioned over the toilet pot as there are chances that stool from the lower part of the intestine will also be realised. The tube needs to be surely detached prior to exhaling otherwise there are chances that the tube might get blocked with the bits of stool. The tube is needed only by the beginners. After gaining experience the tube is no longer needed as the individuals are capable of sucking water straight away into the bowel. Although this stage comes after years of practice, while performing the jala basti without using the tube the individual needs to push the rectum outwardly as much as comfortably possible, after that it will be drawn in with the help of uddiyana. Initially the sphincter muscles have to be opened using the fingers, uddiyana will be performed and the hand can be removed. The individual needs to hold the position of kumbhaka till the maximum time and then exhale slowly.

It is essential to expel all the water after the completion of jala basti practice. After completion, the individual needs to come in shavasana on the mat. Gradually come into the position of pashinee mudra, the knees have to be placed besides the ears and balanced, they can be placed at the back of the shoulder, the hands are held behind the knees. This position helps in releasing the air trapped in the bowel and helps in instigating the bowel movement, the water that is left can be easily released by this action.

The individual must once again come into the shavasana position. The knees have to be folded till the chest, holding this position shift the knees on both sides in a rocking manner, the arms need to be stretched as far as possible at the level of the shoulders. Once again the position of shavasana needs to be taken and after ten counts the individual needs to perform bhujangasana three to five times at a very slow pace. This will help in releasing the left over water and air from the lower intestine due to the pressure exerted on it. In case any person is up to it then mayurasana may be performed. The most effective pose countering this is the Pashinee mudra.

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Precautions need to be taken while practicing Jala Basti:

- The water used in the practice has to be 100 per cent clean and purified.
- The temperature of the water needs to be correct.
- During winters water temperature should be lukewarm.
- The water need not be salty.
- It is essential to sterilise the tube before and after the practice.

Jala basti may be performed during winter as well as summers particularly by individuals performing high intensity pranayama and bandhas. The practice helps in generating energy and at the same time it helps in cooling down the system. However it is advised to avoid the practice during monsoon and rainy weather.

9.2.2 Sthala Basti

During the practice of Sthala basti, which is also referred as dry basti, the individual has to lie on the back, the Vipareeta karani mudra position is assumed maintaining a sixty degree angle from the ground. After lying in this position the individual needs to get the knees towards the chest. Push the sphincter muscles need to be pushed outward and then inwards in order to suck air in the bowel. This practice is comparatively tough and for this reason individuals first need to perfect their practice of jala basti. The practice of sthala basti may be done using pashinee mudra or paschimottanasana, while carrying out ashwini mudra. Initially uddiyana will be needed as well. Air is not easily sucked in paschimottanasana since it exerts pressure over the anus; therefore it is advised to begin with asana in an inverted position. It is strongly advised in the Hamharatnâvalî that food should be consumed only after one and half hour of the practice.

Sthala Basti can be performed in several ways. It is effective in all ways; individuals may choose the way that suits them the best. Given below is the description of three postures, namely half Paschimottanasana posture, lying flat on the ground or with Utkatasana posture.

Sthala Basti beginning from Paschimottanasana

In this method individuals begin by being in Paschimottanasana, meaning that they sit with their legs stretched and then bending halfway forward. The hips may be opened by using the hands for a comfortable posture. After sitting in this posture Uddiyana Bandha needs to be performed. The anal muscles need to be contracted so that air can be sucked inside. First the air is taken in so that it can be pushed out in form of flatulence. You need not, however, fully place your upper body on your legs but only bend forward halfway.

Sthala Basti by lying flat on the ground

This position is comparatively simpler therefore beginners are advised to perform the sthala basti using this posture. In the lying down position the organs and the

rectum come down ward. The individual needs to lie on their back and the knees have to be bending up to the chest, the hips have to be raised so that the sphincter muscles can be worked up on. The hips are contracted inward in order to suck air in the colon. The air is taken in and released as flatulence.

Sthala Basti with the help of Utkatasana

Early texts on yogic practices recommend the usage of a hollow stick as an aid for performing Sthala Basti with the help of Utkatasana. In recent times a tube or a catheter is used. Even a Basti Yantra can be used; this is a pipe which is thick on one side and thinner on the other end. The pipe or tube is only needed initially and help the beginners to master the position. Take the Utkatasana pose and then put the pipe inside the colon and practicing Uddiyama Bandha. Then air needs to be sucked deeply into the colon so that it can be released as flatulence. This has to be repeated for at least three to five times.

Advantages of Sthala Basti

- The practice helps in providing relief from gastral problems of the colon.
- The practice of Sthala Basti helps in releasing the trapped air in the colon and the bowel.
- Stomach pain caused due to gas is relieved with this practice.
- The practice helps in balancing the Vata of the body.
- The practice helps in curing irritable bowel syndrome issues.
- The practice helps in keeping the digestive system free from gas therefore it is able to function effectively.
- Problem of piles is completely eliminated
- One can prevent piles and other problems with the practice of Sthala Basti.
- By keeping the intestinal problems at bay it improves concentration and reduces the problem of headache which is often related to weak digestion.
- The first chakra and root chakra are stimulated with the help of Sthala Basti.

During this practice, individual needs to focus on working the sphincter muscles. Initially, most people find this difficult as they are not in the habit of pulling the air into the colon, however with practice it becomes easy.

Check Your Progress

1. What is Basti in yoga?
2. What are the precautions need that to be taken while practicing Jala Basti?

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9.3 MOOLA SHODHANA

According to Hatha Yoga, Moola Shodhana is considered to be a part of Shatkarma's Dhauti. The term 'moola' denotes root and in this context it is referring to the body part – anus and 'shodhana' refers to cleansing. Therefore, it denotes the purification of the body's root. Moola Shodhana is often referred to as Ganesh Kriya, referring to the procedure that cleanses the human anus and rectum.

Advantages of Moola Shodhana

One of the frequent causes of constipation is faulty lifestyle. Individuals following a sedentary routine often have a sluggish flow of blood in the body; these people mostly indulge in eating unhealthy food and as a result have an untimely eating pattern. This further aggravates the problem and makes it recurrent. Another cause of constipation is high stress levels and depression. Constipation often leads to piles. And these occur due to blood's coagulation. Both these disorders can be treated by regularly practicing moola shodhana. They can be treated with the help of the practice because of following reasons,

- The practice helps in increasing the flow of blood in the anus and rectum.
- Once the flow of blood is improved it helps in stimulating the nerves and makes them to perform to the best of their abilities.
- The muscles become strong because of the mild pressure.
- The hard matter which is gathered in these parts of the body can be easily removed.
- The practice also helps in painless and easy defecation.
- The practice of Moola Shodhana also helps in treating not only constipation but also piles as in most cases piles is caused due to lack of bowel movement.

Technique of Moola Shodhana

- The individual needs to come in a position of squatting, like sitting on a chair
- The middle finger needs to be lubricated with greasy substance like oil or ghee.
- Lubrication needs to be done on the anus
- Lubricate your middle finger with some oil or ghee
- The anus and the area around it have to be lubricated.
- The index finger has to be gently and gradually inserted inside the anus, in the beginning the finger should be inserted up to two centimetres.
- The finger needs to be rotated for ten times in circular motion, both clockwise as well as anti-clockwise. The sets of rotation should be repeated two to three times.

Precautions to be taken while practicing Moola Shodhana

The finger should be washed nicely after removing it from the anus, also the area around the anus needs to be rinsed with cold water, as this further stimulates the area. After regular practice the pressure applied on the inside walls of anal area can be increased. In order to generate more stimulation one can reflex and contract the muscles of the anus with the finger inside. The person practicing the kriya needs to maintain proper hygiene, the nails should be kept clean and need to be trimmed. Application of nail paint should be avoided. Before and after the practice the hands should be thoroughly washed with an antiseptic soap.

In olden days people used a root of turmeric as it has several medicinal benefits as well. The turmeric root is not always available therefore the index finger is now frequently used. The Indian style of toilets provided the best position for defecation as the position helped in putting pressure on the abdomen. In this the individual maintained a squatting position. The Indian toilets were soon replaced with western style of toilets, though they provided comfort and strain on the knees was reduced but the position was not right for practicing moola shodhana. The best time to perform the kriya is early morning before using the washroom. The kriya will help in the act of defecation and people suffering from constipation will also be able to relieve themselves.

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9.4 VYUTKRAMA KAPALBHATI

Vyutkrama Kapalbhata is another variation of Kapalbhata also referred to as the skull shining breathing technique. The mention about the practice can be found in the text of yogic practices titled as 'Gheranda Samhita'. In this practice the water has to be drawn into the nose and ousted from the mouth. The technique helps in getting rid of problems related with sinus. It not only helps in cleaning the cavity in the nasal track but also cleanses the throat and the pharynx.

Vyutkrama Kapalbhata is a segment of Shatkarma and it is also amongst the six practices given in Hatha Yoga that help in purification. Kapalbhata is a Sanskrit term, 'Kapal' refers to the skull or head and 'Bhata' refers to glow or shine. Vyutkrama kapalbhata helps in cleansing the skull's contaminations and provides a glow on the face. The practice should be performed in the morning after completing the morning routine for maximum result.

The practice is very similar to the Jala Neti practice. The latter practice is performed using a Neti pot, the pot helps in filling water into the nostrils then this water is released from the mouth. The practice of Vyutkrama Kapalbhata is done without using a pot. In its place the water is drawn straight into the nostrils, the water is placed in a vessel or held in the palms, the water is released through the mouth.

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Method of Performing Vyutkrama Kapalbhata

In order to start the practice, warm water is needed. Salt may be added to the water, the ratio of salt and water should be approximately one tablespoon for a litre of water. Warm saline water helps in purging of the mucous layer that forms in the cavity of the nasal track and prevents irascibility. The individual performing the practice has to stand straight.

The hands need to be joined so that they form a shape of a cup. Water needs to be added into the cup formed by the palms and positioned near the nostrils in a tilting position. The head should be drawn slightly away so that the water can fall into the nostrils. With practice this action becomes easy. After repeatedly performing the kriya the water will reach the throat and released from the mouth. The act needs to be repeated a couple of times for thorough cleansing.

Advantages of Vyutkrama Kapalbhata

- Individuals performing the Vyutkrama Kapalbhata are able to clean the mucous from the throat and cavity of the nose.
- According to Gheranda Samhita, the practice helps in removing Kapha Dosha and provides overall wellbeing and energy for performing various activities.
- The practice is known for providing spiritual benefits such as activation of brain's energy midpoints and these points help in triggering the nasopharynx points.
- The practice is believed to be helpful in activating the Bindu Chakra located in the exterior part of the head.

Precautions while performing Vyutkrama Kapalbhata

The practice of Vyutkrama Kapalbhata is known for its advantages, the only precaution required while practicing is that the water should not enter the lungs. The danger is only in the beginning after repeated performance the individuals are able to master the correct position of the head.

9.5 SHEETKRAMA KAPALBHATI (MUCUS CLEANSING)

Another breathing technique for attaining a glow of the skull is Sheetkrama Kapalbhata. It is a variation of Kapalbhata. Just as the vyutkarma kapalbhata, this has been revealed in the text of yogic practices titled Gheranda Samhita. The practice is a reverse of vyutkrama kapalbhata as in this the mouth is used to suck the water in and then it is released from the nose. This also helps in removing the mucus accumulated in the cavity of the nose, throat and the pharynx.

Sheetkrama Kapalbhata is a segment of the Shatkarma and also amongst the practices mentioned in the Hatha Yoga for purification of the skull. The cleansing of the skull helps in bringing a glow on the face. Like other purification practices early morning is the best time to perform this practice after the completion of the morning routine.

Method of Performing Sheetkrama Kapalbhata

In order to start the practice, warm water is needed. A pinch of salt may be added to the water. Warm saline water helps in purging of the mucous layer that forms in the cavity of the nasal track and prevents irascibility. The individual performing the practice has to stand straight.

The tongue has to be curled inside the mouth so that it shapes as a tunnel. The water has to be taken into the tunnel created by curling. The water should be held in the mouth for a couple of seconds. The person should bend in front, head titling downwards so that the nostrils are pointing towards the ground. The gravitational pull will help in releasing the water from the nose. Tucking the throat inward will make the water flow out easily. Initially the water can be released frequently. The water unable to pass through the nose may be released through the mouth. With repeated practice the water will be easily released from the nose itself. The water needs to be repeated a couple of times.

Advantages of Sheetkrama Kapalbhata

The mucous present in the nasal cavity and throat is removed with the help of sheetkrama Kapalbhata.

According to Gheranda Samhita, the practice helps in removing the face wrinkles and provides an instant glow on the face. The text also states that individuals frequently practicing Sheetkrama kapalbhata are able to get rid of diseases and the aging process slows down.

The text states that the practice helps in removing Kapha Dosha and provides overall wellbeing and energy for performing various activities.

Spiritual benefits are similar to the vrutkarma kapalbhata. It is further believed that the awakened Bindu Chakra helps in the flow of amrit and makes the human body eternal.

Initially, individuals fear that the water may enter the lungs. After frequent practice of sheetkrama kapalbhata people understand that the gravity helps in water to flow from the nose and there is nothing to worry. It is essential to bend the head correctly and keep it ninety degrees from the ground.

9.6 TRATAKA (CONCENTRATED GAZING)

Trataka is a powerful practice and needs to be mastered well for its complete effectiveness. The practice involves concentrated gazing on a static point. The

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practice can be done using two techniques, the first one is known as ‘bahiranga’ or external trataka and the second technique is known as ‘antaranga’ or internal trataka. The first technique i.e. the Bahiranga is comparatively simpler than the second one. It involves gazing at a fixed object or sign visible to the eyes externally. The second technique involves gazing at an object which is a substance of internal visualisation.

The process continues till the form is manifested inside the head while the eyes are closed. The point of focus is generally a sign or objects that have the capability to activate the internal potential and is able to captivate the mind. Candle flame acts as an effective sign as the image of the flame stays in the mind for some time even after the closing of the eyes. This helps in the performance of the antaranga trataka. By focusing on an object externally the mind is able to create an internal image of the same and even after closing the eyes the image remains steady.

The process of Trataka helps in improving the mind’s concentration and prevents tendencies of wavering. The practice of mind concentrating on a single point is referred to as ‘ekagrata’. This practice has to face several obstructions because of the constant movement of the eyes. These movements prevent the eye on focusing on external objects let alone the internal ones. Once attempts are made to concentrate on the unchanged object continuously the brain gets used to the object and no longer registers the object. Familiarization accords with an upsurge of alpha waves signifying weakened optical responsiveness to the outside world. As soon as the alpha waves start to develop it is a clear indication that the brain is no longer functioning in the specific area. Once the responsiveness is limited to a single fixed stimulation of senses such as touch or sound, the mind is not focusing. Whole concentration on one fixed observation brings extraction of connection with the outside world.

In the practice of trataka the visual observation is blanked out and as a result the central nervous system starts to work in seclusion. In yogic practices this state is termed as sushumna. Trataka has several powerful signs besides the candle flame. Some of the other signs are use of crystal ball, a Shiva lingam, yantra, mandala, the full moon, a star, the sun-rise or sun-set, a chakra, the Om symbol or even an individual’s shadow. Along with these powerful symbols, trataka may be done using any object like a flower, water body, mountain or a stone. Anyhow it is essential to be selective while choosing the sign used as trataka symbol. The image should not arouse fear or negative images, for this reason it is safest to use the candle flame.

Advantages of Trataka

- As per the yogic text ‘Hatha Yoga Pradipika’ by Swatmarama, Trataka helps in eradicating eye diseases, tiredness and lethargy. The practice helps in providing long term cure from any such disorders. The practice helps in curing several other physiological and mental ailments.

- The practice is known for curing depression, insomnia, allergy and anxiety.
- It also helps in improving the memory and ability to concentrate.
- The practice helps in focusing the mental energy on positive aspects.
- According to yogis, the practice provides psychic healing, improves will power. The practice provides relief from several eye disorders, cures headache, myopia and in some cases has known to cure early stages of cataract.
- It adds a spark and a shine in the eyes which help in enhancing their facial beauty.

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Check Your Progress

3. What is the significance of Moola Shodhana to health?
4. What is the best time to perform Kapalbhata?
5. Name the Hath yoga practice which develops the power of concentration.

9.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. 'Basti' is a Sanskrit term which generally refers to everything connected with lower parts of the body namely the abdomen, pelvis and the bladder. It is Hath yoga cleansing technique that targets the lower abdomen particularly the colon is referred as practicing of basti in yogic practices. Basti can be practiced on dry ground as well as in water.
2. There are a few precautions which should be taken while practicing Jala Basti, such as the following:
 - The water used in the practice has to be 100 per cent clean and purified.
 - The temperature of the water needs to be correct.
 - During winters water temperature should be lukewarm.
 - The water need not be salty.
 - It is essential to sterilise the tube before and after the practice.
3. Moola Shodhana is often referred to as Ganesh Kriya, referring to the procedure that cleanses the human anus and rectum. It improves the overall digestive system, helps to overcome constipation and helps to strengthen the abdomen area.
4. The practice of Kapalbhata should be performed in the morning after completing the morning routine for maximum results.

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5. Trataka is the Hath yoga practice which develops the power of concentration. The practice involves concentrated gazing on a static point. The practice can be done using two techniques, the first one is known as ‘bahiranga’ or external trataka and the second technique is known as ‘antaranga’ or internal trataka.

9.8 SUMMARY

- Basti is a Sanskrit term which generally refers to everything connected with lower parts of the body namely the abdomen, pelvis and the bladder. The process of cleansing the lower part of the abdomen particularly the colon is referred as practicing of basti in yogic practices.
- The technique of practicing on dry ground is known as sthala basti and when performed with water it is known as Jala basti. Another practice is suksha basti, meaning dry and it is also referred to as vata basti.
- The practice of Basti helps in eliminating all disorders that occur due to excessive air, bile and mucus. Basti helps in curing disorders in the digestive system such as constipation, controls diarrhoea occurring due to nervousness. It provides strength to solar plexus.
- The practice of Jal Basti helps in generating energy and at the same time it helps in cooling down the system.
- The practice of Sthala basti , which is also referred as dry basti, the individual has to lie on the back, the Vipareeta karani mudra position is assumed maintaining a sixty degree angle from the ground.
- The practice of Sthala Basti helps in providing relief from gastral problems of the colon. It also helps in releasing the trapped air in the colon and the bowel.
- Moola Shodhana is often referred to as Ganesh Kriya, referring to the procedure that cleanses the human anus and rectum. The term ‘moola’ denotes root and in this context it is referring to the body part – anus and ‘shodhana’ refers to cleansing. Therefore it denotes the purification of the body’s root.
- The practice of Moola Shodhana also helps in treating not only constipation but also piles as in most cases piles is caused due to lack of bowel movement.
- Vyutkrama Kapalbhata is another variation of Kapalbhata also referred to as the skull shining breathing technique. The technique helps in getting rid of problems related with sinus. It not only helps in cleaning the cavity in the nasal track but also cleanses the throat and the pharynx.
- Another breathing technique for attaining a glow of the skull is Sheetkrama Kapalbhata. It is a variation of Kapalbhata. . The practice is a reverse of

vyutkrama kapalbhata as in this the mouth is used to suck the water in and then it is released from the nose. This also helps in removing the mucus accumulated in the cavity of the nose, throat and the pharynx.

- Trataka is a powerful practice which involves concentrated gazing on a static point. The practice can be done using two techniques, the first one is known as 'bahiranga' or external trataka and the second technique is known as 'antaranga' or internal trataka. The process of Trataka helps in improving the mind's concentration and prevents tendencies of wavering.

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9.9 KEY WORDS

- **Colon:** It refers to the main part of the large intestine.
- **Catheter:** It refers to a flexible tube inserted through a narrow opening into a body cavity, particularly the bladder, for removing fluid.
- **Dysentery:** It refers to the infection of the intestines resulting in severe diarrhoea with the presence of blood and mucus in the faeces.
- **Hernia:** It refers to a condition in which part of an organ is displaced and protrudes through the wall of the cavity containing it.
- **Colitis:** It refers to the inflammation of the lining of the colon.
- **Rectum:** It refers to the final section of the large intestine.
- **Sphincter muscles:** A sphincter is a circular muscle that normally maintains constriction of a natural body passage or orifice and which relaxes as required by normal physiological functioning.
- **Flatulence:** It refers to the accumulation of gas in the alimentary canal.

9.10 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write short notes on Jala Basti and Sthala Basti.
2. Briefly describe the technique of performing Moola Shodhana.
3. How Sheetkrama Kapalbhata is different from Vyutkrama Kapalbhata?

Long Answer Questions

1. Describe the various benefits of Basti.
2. Discuss the different ways of performing Sthala Basti.
3. Explain the advantages involved in the practice of Trataka.

9.11 FURTHER READINGS

NOTES

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UNIT 10 MEDITATION

Structure

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- 10.1 Objectives
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 - 10.2.1 Types and Methods of Meditation
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 - 10.3.1 Essential Meditation Posture Indicators
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10.0 INTRODUCTION

Meditation is training the mind to focus on a specific object. Individuals meditate in order to achieve mental clarity and peace of mind. The technique of meditation helps in reducing stress and provides emotional peace. Meditation has been in practice since many years, its mention has been made in several ancient and religious texts. From the beginning of nineteenth century, it has become an integral part of all cultures and is widely practiced not only by yogis but also common man. In this unit, you will learn the aspects related to the yogic practice of meditation including the different postures involved, the concept of transcendental meditation, antar mauna and the concept of nadis.

10.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the concept of meditation
- Explain the types and methods of meditation
- Describe the meditation postures
- Examine the concept of transcendental meditation
- Discuss Antar Mauna
- Explain the concept of nadis including sushumna nadi

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10.2 INTRODUCTION TO MEDITATION

Meditation is used for establishing mental peace and strength, but the practice is not merely restricted to this utility. Meditation helps in decreasing stress and anxiousness. It is a remedy for treating depression and physical pain. The practice helps in achieving overall wellbeing. Over the years, the researchers have been studying the benefits of meditation for curing several physiological disorders related to human body.

The English word meditation has a Latin origin, it has been derived from the Latin verb, ‘meditari’, which means ‘to ponder, think, consider or create’.

10.2.1 Types and Methods of Meditation

There are many types of meditations. In the Western parts of the world, they have been broadly categorised in two forms. The first one is referred to as focused attention meditation, in this form the mind is made to voluntarily focus on a selected object, could be live or still and may have any shape. The second type includes monitoring the contents of every single moment of the experience without reacting. This form is also referred as open monitoring meditation.

In the concentrated meditation, the person practicing, focuses very intently on a specific object, whereas in the mindfulness meditation form the practitioner is observing all events in the mind that are entering the arena of consciousness.

Methods Used

Focused meditation comprises of giving attention to the breathing, to a concept or emotion. This is similar to single point meditation and the focus could be on a chant as well. In the second form, the methods used include mindfulness, Shikantaza and other states of consciousness. There are few techniques wherein methods of both the forms are used, these include the practice of vipassana, in this Anapanasati is used for groundwork; the other practices using both methods are Samatha/ calm-abiding, and Headspace.

Another method which is used for meditation is referred to as ‘no thought’, here the person practicing meditation is completely attentive and fully conscious. They are in control of their senses and they do not let their mind to think about any surplus thoughts. This is method is very different from other popular approaches of meditation, the individual allows thoughts to enter but remains completely disconnected from them and does not let the mind ponder over them. While practicing Sahaja yoga, all thoughts are stopped, and meditation practice involves only spiritual activities. There is no mental activity taking place during the practice of ‘clear light yoga’, this is similar to the ‘no thought’ method imparted by Huineng and preached in the philosophy of Yaoshan Weiyen.

Automatic self-transcending method is part of the transcendental meditation. This will be discussed further in the unit. There are several other typologies of

meditation, in these the methods are divided into practices such as concentrative, generative, receptive and reflective.

Meditation

10.3 MEDITATION POSTURES

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Meditation is performed in several forms all over the world, if observed closely some of the forms are more frequently used than the others. The reason for this similarity is because the postures which provide mental peace and body alignment are universal.

10.3.1 Essential Meditation Posture Indicators

The posture during meditation session is very important. It is essential to maintain correct posture for availing the benefits of meditation. There are many postures to choose from, everyone can opt for the posture that suits them the best. The most essential feature of the meditation posture is keeping the back straight at all times. Beginners should not opt for postures that are too complicated. Meditation postures should be selected keeping the following elements in mind:

- **Ease:** In order to concentrate on the practice, the body needs to be comfortable; physical pain and discomfort will act as distractions. The purpose will be lost in case the practice leads to suffering rather than mental peace.
- **Relaxation:** All the body parts should be relaxed while meditating. In case the meditation is carried out while sitting then the arms have to be comfortably resting on the sides and the palms can be either placed on the thighs or remain locked in the lap. Cushions should be used to sit on so that the knees are comfortably touching the ground. A cushion may be placed under the knee as well so that it is not strained. In case the meditation is performed seated on a chair, then ideally the hips have to be little above the knees. The effects of meditation will be only be felt when the posture is comfortable and relaxing.
- **Position:** As stated above, individuals have to keep their back absolutely straight in all postures of meditation. Along with the back, the other parts have to be perfectly aligned throughout the process. The body should be held in a straight and stately position. The person should not hunch in front or lean backward. Sitting straight is essential throughout the practice. The chin has to be tucked inwards slightly.
- **Quietness:** It is essential to maintain stability of the body in all positions. The practice requires balance. For this, the practitioner may rock their body in different directions so that the perfect balance can be established in the posture. Conscious efforts need to be made to be seated in one place throughout the practice. While practicing certain forms of meditation, the eyes have to be kept open and it is ideal to look downward. In case the

body gets uncomfortable and numb while maintaining a constant pose, then the shifting should be done very tactfully so that stillness is maintained.

Seven-Point Meditation Posture

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The Tibetan Buddhist framework archetypally uses a seven-point meditation posture also referred to as the seven points of Vairocana. The Buddha Vairocana is frequently characterized with the sitting posture in the middle of a mandala and it has five principle Buddhas. He is regarded as the lord of the Buddha family, the white represents all-encompassing wisdom along with the contrasting with extreme ignorance which is the dynamic energy behind the cycle of suffering. The centre represents the notion that human ignorance may be changed into immense capaciousness that is able to encompass everything within itself.

Sitting Down: The first point of posture is meant for people used to sitting on a chair. They are not in a habit of sitting with legs crossed on the ground. In case somebody finds it difficult, they can sit in the easier postures from the variations mentioned below. It helps to sit in a cross-legged fashion on the ground with the help of a proper meditation cushion.

Sitting position for meditation: There are different kinds of sitting positions for meditation

- **The Quarter Lotus:** In this, the practitioner's legs are loosely crossed and the feet rests under the opposite thigh or knee. This is the most recommended posture.
- **The Half Lotus:** The position is different quarter lotus as the legs are crossed by one foot resting on the opposite thigh. The other foot may be kept folded below the top leg and remain in a resting position under the knee or thigh.
- **The Full Lotus:** This position is commonly known as Padmasana or the Lotus Posture. The legs of the practitioner are crossed and both the feet rest on opposite thighs.
- **The Burmese Position:** This posture is referred to as Easy Posture. Practitioners not able to sit in any of the above-mentioned lotus poses may sit in this pose during meditation. Both the feet lie on the ground in a relaxed manner, also known as Sukhasana. It involves being seated in a simple cross-legged position.
- **Seiza:** The practitioners may kneel and keep a cushion between the legs, in place of sitting with legs crossed. This posture is the traditional meditation pose and basically a form of Virasana also referred as Hero Pose and Vajrasana or the Thunderbolt Pose.
- **Chair:** The practitioners are allowed to sit on a chair, they have to make sure that they sit straight and do not rest on the back of the chair; the feet have to be placed firmly on the ground. The feet, hips and the knees have to be properly aligned so that the posture is erect and firm.

- On few occasions meditation is performed in a lying down posture. The practitioner can keep their feet on the floor keeping the knees folded; this will help in staying awake.

Elongating the Spine: The second point of posture after firmly establishing the foundation involves lifting the spine. According to traditional correspondences, the spine needs to form the shape of an arrow. This posture helps in feeling elevated while practicing meditation.

Resting of Hands: The third point of posture involves that the hands need to be rested on the laps. The hands should be dropped at the sides, they may be lifted from the elbow and the palms are dropped on the thighs. Thighs become the accepted alignment point where they can be rested, this helps in giving good support to the spine's upright position. Kilung Rinpoche has mentioned in his book *The Relaxed Mind* that resting the palms down helps in relaxing and flowing energy all over the body. Instead, the right hand can be kept on top of the left by making the thumbs touching very lightly; hands should be rested on the lap near the navel. According to Kilung Rinpoche, this position helps in generating additional heat and energy for the body. This helps in sleeping better. Characteristically, wisdom is represented through the left hand while the right hand represents compassion. By this position of hands wisdom and compassion are amalgamated.

Relaxing the Shoulders: The fourth point of posture involves for the muscles of the shoulder and back to relax. The shoulders have to be pushed back a little. This helps in establishing the strength of the shoulders and makes the frontal body to open up. This point of posture makes the heart vulnerable as the heart is exposed.

Pushing in the Chin: The fifth point of posture involves tucking the chin only so much that the eyes are at the level of the lap. The aim is to bend only so much that head does not get tired.

Opening the Jaw: The sixth point of posture brings a feeling of relaxation to the facial muscles. The jaw is hung open and the tongue is placed against the upper part of the mouth so that breathing is clear. The process of swallowing gets a little slow and sometimes becomes distracting.

Resting the Gaze: The seventh point of posture involves relaxing the gaze a couple of feet far on the floor. The focus is not specific; idea is to maintain a general gaze. Relax the eyes. People often do not realise the importance of keeping an open gaze while meditating. It is essential to keep the eyes open as the purpose of meditation is to find oneself, it will be done better with open eyes and second reason for keeping the eyes open is to help in remaining awake.

In case someone finds it difficult to meditate with open eyes then closing the eyes can be an option. Although this decision has to be taken before the practice is started. It is believed that meditation with closed eyes gives rise to more thoughts and distracts the mind and prompts daydreaming. But meditation is possible with closed or open eyes.

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After choosing the correct posture meditation can be effectively practices. The mind is able to concentrate. The seven-point postures help in relaxed meditation.

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Check Your Progress

1. List some of the methods used in the monitoring meditation.
2. What is the Half Lotus position?
3. State the third point of the 7 points of meditation.

10.4 OTHER MEDITATION TECHNIQUES

In this section, you will study about some of the prominent techniques of practicing meditation.

10.4.1 Transcendental Meditation

Meditation form performed using silent mantras is known as transcendental meditation. Maharishi Mahesh Yogi created the technique of Transcendental Meditation. In this form of meditation mantra is used. The practice is done two times in a day using the mantra for duration of fifteen to twenty minutes; the practitioner performs the technique in a sitting position with eyes closed. Transcendental Meditation (TM) is amongst the most popular forms of practicing meditation. There have been several researches undertaken in order to figure out the effectiveness of the technique. Over three hundred reviewed studies have been published till date. The technique has been introduced into educational and community programs in several parts of the world, including USA, parts of Europe, India etc.

The technique is regarded as religious and non-religious, it has features of new religious movement, with its roots in Hinduism and as a non-religious technique it helps in developing inner self. The technique has been in practice for over fifty years and it often features in media and is used as an effective marketing device. Over the years advanced level of the technique has developed known as the TM-Sidhi program. Science of Creative Intelligence had defined TM as contemporary science which combined the earlier Vedic science.

10.4.2 Antar Mauna

The Sanskrit word ‘Antar Mauna’ denotes internal silence. It is a technique used for yogic meditation. The technique includes converting and guiding the thinking process with the help of self-awareness and open mindedness. The senses are internalizing in this form of meditation and the yogi perceives the internal and fundamental arrangement of the mind and thinking processes. The Satyananda system of yoga was developed by Swami Satyananda Saraswati of the Bihar School of Yoga in India and he also developed the six stages to ‘Antar Mauna’. Satyananda yoga includes the characteristics of Jnana, Bhakti and Karma yoga.

It is important for the yogis to master the initial three stages of Antar mauna meditation, after mastering these three stages the remaining stages can be mastered. It is in the final stage that the yogi touches a state of dharana meaning concentration. Concentration is the fifth limb of yoga, there are in total eight limbs. The seventh limb of yoga is dhyana meaning profound meditation.

Six stages of Antar Mauna:

- Having awareness of the outside sensory observations
- Attaining consciousness of unprompted thoughts
- Creating and arranging thoughts
- Advanced consciousness and discarding unprompted thoughts
- Attaining a condition with all thoughts absent
- Having complete consciousness of selected personal mental symbol of the yogi

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10.5 NADIS

Astral tubes are made with the help of astral matter and these are referred to as nadis. The nadis help in carrying the mental currents. 'Nadi' is a Sanskrit word and is derived from the root 'Nad' meaning 'motion'. Nadis help in the flow of the vital force or Pranic. These are formed due to elusive matter therefore it is not visible with naked eyes and experiments are not possible. The Nadis of yoga are not common nerves, arteries or veins usually a part of the anatomy and physiology.

There are many Nadis in human body; it is not possible to count them. Many assumptions have been made about their number, ranging from 72,000 to 3, 50,000. It is believed that only the divine power knows their exact number in the human body. The role of Nadis is very important in yoga.

Once the Kundalini is awakened it will travel through Sushumna Nadi and this can happen only once there is purity of the Nadis. As a result, purifying the nadis becomes the initial step in Kundalini Yoga. It is important to have complete knowledge of the Nadis and Chakras. It is essential to deeply study their position, roles, nature, etc.

Yoga Nadis deeply influence the physical body. These are merely subtle lines, but they have a close relation with the actual nerves and veins of the human body. Their importance cannot be overlooked because the astral centres are closely related with the physical centres. The vibrations formed in the physical centres with the help of arranged methods directly impact the astral centres.

Every time there is an intermingling of a number of nerves, arteries and veins, this centre is known as 'Plexus.' Pampiniform, Cervical, Brachial, Coccygeal, Lumbar, Sacral, Cardiac, Oesophageal, Hepatic Pharyngeal, Pulmonary, Ligal

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Prostatic Plexus, etc., are the plexuses recognised by the Vaidya Shastra. In the same way there are plexuses in the Sushumna Nadis. They are recognized as 'Padma' (lotus) or Chakras.

The Nadis arise from the Kanda. It is at this point that the Sushumna Nadi is linked with the Muladhara Chakra. According to yogis, the Kanda is located twelve inches above the anus. There are fourteen essential Nadis in the body. The most important amongst the fourteen Nadis are Ida, Pingala and Sushumna. The chief Nadi is Sushumna. It is the utmost and mostly sought after by the Yogins. All the remaining Nadis are secondary.

In order to study the Nadis and Chakras it is important to understand the spinal column as the Chakras are linked with it.

Spinal Column is identified as Meru Danda. It is the axis of the body, in the same way as the axis of the earth is Mount Meru, for this reason the spine is known as the 'Meru'. Spinal column is also called spine, axis-staff or vertebral column. Human beings are microcosm. There are three main divisions of the body namely, head, trunk and the limbs, and the central part of the body lies in between the head and the legs. The spinal column spreads from the first vertebra, Atlas bone, till the end of the trunk. Spine has been formed with thirty-three bones known as vertebrae; as per their position in the body they have five divisions:

- Cervical region has seven vertebrae
- Dorsal region has twelve vertebrae
- Lumbar region has five vertebrae.
- Sacral region also has five vertebrae.
- Coccygeal region has four vertebrae

Vertebrae are like a pillar which helps in supporting the cranium and the trunk. The bones in the vertebrae are stacked on each other giving it a shape of a pillar. These bones are linked with each other with the help of spinous, transverse and articular processes and by plugs of fibro-cartilage in the bones. All bones in the body are connected with the spine. Sandwiched between every pair of vertebrae there are apertures, these help in spinal nerves to pass through the spinal cord to various parts and organs of the body. The five divisions of spine relate with the divisions of the five Chakras: Muladhara, Svadhishthana, Manipura, Anahata and Vishuddha. The Sushumna Nadi travels through the deep cylindrical cavity of the vertebral column and on its left side are the Ida and Pingala on its right side.

10.5.1 Sushumna Nadi

Sanskrit term Sushumna means 'very courteous' or 'caring'. It is also known as the central Nadi of the human body. Structurally, the sushumna passes through the body's central axis, crossing the spinal cord. The most essential Nadi of the astral or emotional body is the Sushumna nadi. The free flow of prana through the sushumna helps the yogi to achieve a silent concentration; nonetheless, in case

impurities are present in any other nadis of the body, the free flow of the pranas will not be possible, and they will not pass through the sushumna.

The sushumna nadi helps in connecting the muladhara chakra to the sahasrara chakra, and this creates the path which allows the ascension of kundalini energy to reach the spine into the sahasrara. This is regarded as the main channel for the movement of prana all over the body and helps in uniting all the remaining chakras of the body with each other. Next to the sushumna nadi, there are two more nadis that join and cross over the spine, they meet at the centre of the sushumna nadi, and these are:

- Ida nadi — positioned on the left side of the spine and it helps in carrying the womanly lunar energy. Begins at the muladhara chakra and finishes in the left nostril.
- Pingala nadi — positioned to the right side of the spine and helps in carrying the male solar energy. Begins at the same place as the ida nadi but it finishes at the right nostril.

The yogis aware about the sushumna are able to aim at spiritual awakening and increased the spiritual flow of energy. Their awareness helps them to realise the impact of the prana flow in the entire body. They are also bale to focus on allocating energy all over the chakras. The stimulation of sushumna is done with the help of Chakra meditation. It helps in getting it out of its quiescent position.

Check Your Progress

4. What happens at the Kanda position in the body?
5. Name some of the most important Nadis.

10.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. In the monitoring form of mediation, the methods used include mindfulness, Shikantaza and other states of consciousness.
2. In the Half Lotus position, the legs are crossed by one foot resting on the opposite thigh. The other foot may be kept folded below the top leg and remain in a resting position under the knee or thigh.
3. The third point of 7-point meditation posture involves that the hands need to be rested on the laps.
4. The Nadis arise from the Kanda. At this point, the Sushumna Nadi is linked with the Muladhara Chakra.
5. The most important amongst the fourteen Nadis are Ida, Pingala and Sushumna.

NOTES

10.7 SUMMARY

NOTES

- Meditation is training the mind to focus on a specific object. Individuals meditate in order to achieve mental clarity and peace of mind. The technique of meditation helps in reducing stress and provided emotional peace.
- Meditation is used for establishing mental peace and strength, but the practice is not merely restricted to this utility. Meditation helps in decreasing stress and anxiousness. It is a remedy for treating depression and physical pain.
- The English word meditation has a Latin origin, it has been derived from the Latin verb, ‘meditari’, which means ‘to ponder, think, consider or create’.
- There are many types of meditations. In the Western parts of the world, they have been broadly categorised in two forms. The first one is referred to as focused attention meditation, in this form the mind is made to voluntarily focus on a selected object, could be live or still and may have any shape. The second type includes monitoring the contents of every single moment of the experience without reacting. This form is also referred as open monitoring meditation.
- Meditation is performed in several forms all over the world, if observed closely some of the forms are more frequently used than the others.
- The posture during meditation session is very important. It is essential to maintain correct posture for availing the benefits of meditation. There are many postures to choose from, everyone can opt for the posture that suits them the best. The most essential feature of the meditation posture is keeping the back straight at all times. Beginners should not opt for postures that are too complicated.
- Seven-Point Meditation Posture includes: Sitting Down, Elongating the Spine, Resting of Hands, Relaxing the Shoulders, Pushing in the Chin, Opening the Jaw, and Resting the Gaze.
- Meditation form performed using silent mantras is known as transcendental meditation. Maharishi Mahesh Yogi created the technique of Transcendental Meditation. In this form of meditation mantra is used. The practice is done two times in a day using the mantra for duration of fifteen to twenty minutes; the practitioner performs the technique in a sitting position with eyes closed.
- The Sanskrit word ‘Antar Mauna’ denotes internal silence. It is a technique used for yogic meditation. The technique includes converting and guiding the thinking process with the help of self-awareness and open mindedness. The senses are internalizing in this form of meditation and the yogi perceives the internal and fundamental arrangement of the mind and thinking processes.
- Astral tubes are made with the help of astral matter and these are tubes are referred to as nadis. The nadis help in carrying the mental currents. ‘Nadi’

is a Sanskrit word and is derived from the root ‘Nad’ meaning ‘motion’. Nadis help in the flow of the vital force or Pranic. These are formed due to elusive matter therefore it is not visible with naked eyes and experiments are not possible.

- The most important amongst the fourteen Nadis are Ida, Pingala and Sushumna. The chief Nadi is Sushumna. It is the utmost and mostly sought after by the Yogins. All the remaining Nadis are secondary.
- The five divisions of spine relate with the divisions of the five Chakras: Muladhara, Svadhishthana, Manipura, Anahata and Vishuddha.
- The most essential Nadi of the astral or emotional body is the Sushumna nadi. The free flow of prana through the sushumna helps the yogi to achieve a silent concentration; nonetheless, in case impurities are present in any other nadis of the body, the free flow of the pranas will not be possible, and they will not pass through the sushumna.

NOTES

10.8 KEY WORDS

- **Meditation:** It is training the mind to focus on a specific object. Individuals meditate in order to achieve mental clarity and peace of mind.
- **Nadis:** It refers to the astral tubes that are made with the help of astral matter
- **Antar mauna:** It refers to the Sanskrit word ‘Antar Mauna’ which denotes internal silence. It is a technique used for yogic meditation.
- **Transcendental meditation:** It refers to the meditation form performed which uses silent mantras.

10.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the things to be kept in mind while selecting the meditation posture?
2. Write a short note on the ‘no thought’ technique of mediation.
3. List the five divisions of spine.
4. Where is the Sushumna Nadi located?
5. What are the six stages of Antar Mauna?

Long Answer Questions

1. Explain the types and methods of meditation.

Meditation

2. Discuss the seven-point meditation posture.
3. Describe the Sushumna Nadi.
4. Discuss the concept of Nadis and their location.

NOTES

10.10 FURTHER READINGS

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UNIT 11 CHAKRAS

Structure

- 11.0 Introduction
- 11.1 Objectives
- 11.2 Sukshma Prana
- 11.3 Muladhara Chakra
- 11.4 Svadhisthana Chakra
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NOTES

11.0 INTRODUCTION

Chakras are a part of the astral body, in yoga it is referred to as the subtle body or Linga Sharira. There are seventeen tattvas in Linga Sharira. In yoga, there are eleven indriyas (sense organs), these include five jnanendriyas namely, ears (shotra), eyes (chakshu), skin (tvak), tongue (jivha) and nose (grahna). These five senses help the individual to interact with the world around them. There are five karmendriyas, meaning body parts that help in actions of the body; they help in maintaining contact with the external world. The five karmendriyas are feet (pada) they help in movement; hands (pani) they help in agility; rectum (payu) helps in excretion of waste from the body; genitals (upastha) helps in reproduction; the fifth is the mouth (vak) helps in communication. The eleventh is the mind referred to as manas. There are five pranas among the seventeen tattvas, these are prana, apana, vyana, udana, samana; and the last tattva is intellect referred to as buddhi. The tattvas have parallel epicentres in the spinal cord and the nerve-plexuses in the sthula Sharira (gross body, this is the mortal body that consumes food, does actions and breathes).

All the Chakras are able to regulate and control a specific centre in the sthula sharira. They are not visible through the naked eyes. There are few irrational medics that have attempted to look the presence of Chakras in the actual body and failed to locate them. Since they are not able to see the Chakra, they are not able to believe in Shastras and Yogic Kriyas.

NOTES

Energy is present in whole of the universe and even the human body is full of energy. There are many ancient text and cultures that ascertain the presence of life force inside all living organisms. It is believed that human body has seven chakras. The word chakra is an ancient Sanskrit word and refers to wheel. It is believed that the prana or force of life rotates and spins inside the body of humans. There are seven centres of the energy where spinning takes place; the beginning point is at the bottom of the spine and travelling till the tip of the head. The seven chakras help in providing accurate amount of energy to not only all the body parts but also to the mind and the soul in a healthy and stable individual. The health is bound to suffer even if one chakra is not spinning at the normal speed.

The study of seven chakras helps humans to understand the body's concept of general energy cycle. The knowledge helps in connecting the physical, emotive and spiritual balances that are maintained due to the chakras. This helps in rectifying the imbalance and improves the way of life.

In this unit, you will study about the meaning of seven chakras present in human body. You will also learn about the importance of Sukshma Prana. Also, you will be able to understand the role and significance of yoga and meditation in our life.

11.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe the importance of seven chakras for human beings
- Discuss the meaning and importance of Sukshma Prana
- Explain the significance and methods of performing Muladhara Chakra, Svadhisthana Chakra, Manipura Chakra, Anahata Chakra, Vishuddha Chakra, Ajna Chakra Sahaswara Chakra

11.2 SUKSHMA PRANA

Sukshma Prana travels in the nervous system of the astral body or the Linga Sharira. In the same way, Sthula Prana travels in the nervous system of the gross body. The paths of both the pranas are very closely linked. All their actions and reactions are dependent on each other. The Chakras are eternal as they are a part of the astral body and cannot end with death of the living being. It is believed that formation of chakras takes place while meditating and concentrating. There are many who do not believe in this school of thought, for them, chakras are present in subtle body as well since the gross substance and subtle substances are dependent on each other and they do not exist in isolation. If chakras are formed during meditation then the Sukshma Chakras is also felt while concentration and meditation.

The Sanskrit word Sukshma means delicate or quiescent. For this reason the existence of sukshma can only be felt, as it is not visible. The practice of sukshma yoga helps in relaxation. The technique stimulates physical and psychological peace. Sukshama is yoga form and it comprises of refined movements, these are easy yet very effective. The practice helps in opening the body's channels of energy as a result it helps in improving the energy levels. Practicing sukshma aids in balancing the prana flow all over the body.

Listed below are some of the exercises that are included in Sukshma yoga, these movements can be performed in any position; standing, sitting or lying flat on the ground.

- Rotating the eyes five to six times, alternatively clockwise and anti-clockwise
- Shutting and opening the eyes with slight force, this has to be repeated ten times
- Using the thumb and the index fingers pinch the muscles surrounding the eyes, this helps in relaxing the muscles around the eyes and face.
- Ears have to be held and rotated in circles; the movement should be done for ten seconds.
- Keeping the mouth wide open, massage the chin and jawline with the help of three fingers in a circular movement
- Opening and closing the mouth, this needs to be repeated ten times
- Using the neck muscles turn and look both sides
- Fold the thumb inside the palm and close the hand tightly then open and stretch the fingers repeating this movement eight to ten times will help in improving the circulation in the hand
- Feet rotation helps in relaxing the muscles of feet and legs, the rotation has to be done in circular motion and reverse motion as well, repeating the movement for ten times will be effective.

NOTES

11.3 MULADHARA CHAKRA

The first chakra in the body is muladhara, the name has been derived from the words 'mula' meaning root and 'dhara' meaning support. It is also referred as root chakra. The main role of this chakra is to link all the energies of the body with the Earth, this is termed as grounding. The root chakra helps in surviving on the earth on a daily basis. The function of this centre of energy is to provide all the necessary aspects of survival required by the body. It helps in providing emotional security. Muladhara chakra is situated exactly at the foundation of the human spine, close to the tailbone. It also reaches under the belly button.

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Balance of the Muladhara Chakra provides a feeling of achievement and harmony in matters like finance, security and housing. There will be a sense of contentment. An overactive first chakra will cause issues like anxiousness and restlessness. The fear of survival causes the problems related to anxiety. Health wise the individual might face issues of digestion, pain in the lower back and hip region. An overactive muladhara chakra can also lead to prostate problems in males and the females may suffer from a cyst in the ovaries.

It is important for survival that the first chakra remains in a balanced state. The chakra provides energy for surviving on a daily basis thus it is essential to make proper use of the energy. The chakra can be calmed by focusing on the body's spiritual connection. Individuals must take out time on a daily basis to pray, meditate and indulge in other spiritual connections. The overactive energy of the chakra can be balanced by being kind and showing compassion.

In cases where the needs for survival are generally satisfied, then the first chakra is underactive all through the individual's life. An underactive first chakra may lead to regular bouts of day dreaming, lack of concentration and may arise a feeling of light-headedness. These issues may not seem life threatening but it is essential to have a balanced first chakra, energising the chakra is important. An underactive chakra would result in disconnection with materialistic world. At such times it is important to reconnect with the earth. Being in the natural environment helps to activate the chakra, taking up activities like gardening and swimming will help in energising the root chakra.

11.4 SVADHISTHANA CHAKRA

The second chakra in the body is svadhithana chakra also referred to a sacral chakra. The word svadhithana means 'establishing a place for self'. This chakra helps in establishing the identity of the humans. The chakra helps in bringing creative energy to live life to the fullest on the earth. The energy provided by the chakra helps in motivating humans to reap the benefits of their efforts and enjoy recreational activities in life.

The svadhithana chakra is situated just under the belly button and reaches up to the centre. A balanced second chakra will enable individuals to live life to the fullest and enjoy activities of pleasure within limits. People will enjoy creative activities and have a satisfied married life. There will be a sense of overall well-being.

An overactive svadhithana chakra would lead to addictions and over indulgence in the pleasures of life. It is perfectly normal to take pleasure in life but it has to be within limits. Overdoing creative activities or enjoying things which are not moral are signs of an imbalanced second chakra. Imbalance in the chakra would lead to symptoms like addiction, weight-gain, imbalance of the hormones and anxiety.

The balance of the second chakra can be established by drawing energy from the pleasures and divert it towards the heart. The person should weigh the pros and cons before indulging in any of the pleasure giving activities. It is important to make self-assessments so that the energy of the chakra can be spent in a healthy manner.

The chakra should be balanced; having an underactive svadhisthana chakra can make life very boring and deprived of all the fun. People who mostly tend to behave in an overly practical manner are suffering from underactive second chakra; they are not able to enjoy the benefits of their efforts. Such people could easily become depressed; they have a weak sexual desire, they may not have enough creativity and passion.

The second chakra can be easily energised by enjoying activities of life, eating nutritious food or taking up a creative activity like painting. People should take out time to indulge in their hobbies and enjoy the gifts of nature.

NOTES

11.5 MANIPURA CHAKRA

The third chakra in the body is the Manipura chakra and it is also referred to as the solar plexus. The chakra means ‘radiant gem’. The third chakra helps in arousing the individual’s self-confidence, individuality and inner strength. The chakra helps in taking decisions and making personal choices. It is said to be located in the gut and the phrase ‘gut feeling’ is said to be the wisdom provided by the third chakra.

The Manipura chakra is situated at the core of the belly button and goes up to the breastbone, at the point where the ribs of the body connect at the chest. The balance of the third chakra is very essential. The chakra helps in providing a sense of astuteness, wisdom and inner strength. This chakra is often referred as the warrior chakra; it makes the individual feel like a confident warrior who is about to fight a war. The chakra gives confidence to the individual to wisely win the war. It is important to have a balance of this chakra as the over-activeness of this chakra can have an impact on the lives of others as well. An overactive solar plexus gives rise to short temperedness, controlling nature, self-indulgence, and will lead to uncompassionate and rude behaviour.

Individuals unable to balance their third chakra may suffer from several digestion related problems and can also have kidney or liver disorders. The balance can be achieved by filling the heart with affection and compassion. Meditation helps in achieving a feeling of compassion with other people and within.

An underactive third chakra can lead to lack of energy. This will cause insecurity, timidity and indecisiveness. The chakra can be energised by focusing on personal strengths and talents.

NOTES

11.6 ANAHATA CHAKRA

The fourth chakra in the body is Anahata chakra it is also referred as the heart chakra. Anahata means ‘unharmd’. This chakra helps in empowering the individual’s feelings of love, empathy and thoughtfulness. The understanding of the fourth chakra is easy as everyone is able to associate the heart with feeling of love. The chakra not only helps in loving others but promotes loving self also. For this reason the chakra is connected with wellbeing and healing.

The anahata chakra is situated exactly above the heart and its effect can be felt from the breast bone till the throat. The balance in the chakra enables the individual to love others and self equally. The feeling is maintained during difficult times as well. An imbalance in the chakra leads to extreme behaviour like selfishness and lack of compassion for others. The individual is not able to balance their personal needs and needs of others. People suffering from an overactive fourth chakra feel a rise in their heart rate, excessive sweating, and burning sensation in the chest area. These people have problems in maintaining their relations with others.

The balance of the chakra can be maintained by loving others as much as loving self. It is important to indulge in simple things in order to pamper self as well, small things like taking a relaxing bath or a massage helps and the most effective way to feel compassion for self is by meditating.

People suffering from an underactive fourth chakra may suffer from frequent heart breaks. Such people have a difficulty in maintaining relationships as they are not able to get close to people easily. Health-wise the person may suffer from issues related to circulation.

It is not easy to energise the anahata chakra; people have to undo the defensive wall they erect around their feelings. They have to start loving and respecting themselves along with that have to start spreading compassion to people who are a part of their lives.

11.7 VISHUDDHA CHAKRA

The fifth chakra of the body is the vishuddha chakra and it is also referred to as Throat chakra. Vishuddha chakra means ‘extremely pure’. The chakra helps in voicing the personal truths of people. It provides the energy to speak. Physically the throat enables humans to speak but in this context it is the fifth chakra of the body that allows the voicing of the truth with complete clarity.

The chakra is situated exactly on top of the heart and for this reason the throat chakra is linked with feeling of empathy and love that individuals feel for self and others.

The centre of the chakra is in the middle of the collarbone and it extends up to the heart and goes up to the eyes.

A balanced throat chakra will enable the individuals to speak with clarity. The words spoken will reflect love and tenderness for others and it will be absolute truth. The words will not be out of place and befit the situation. The speech of an individual with a balanced chakra will help in enlightening and inspiring others.

The fifth chakra becomes overactive when people are unable to make themselves heard, when they are not able to convey to others their thoughts. People with an underactive chakra try to speak over others and often interrupt the speech of people. Health-wise such people are bound to suffer from frequent ache in the throat which may lead to infection; they will also suffer from mouth ulcers and problem of cavities.

It is not difficult to achieve a balance in the fifth chakra, thinking before speaking will help in delivering relevant speech. People should curb the habit of interrupting others and also give a chance to others to complete their speech before starting to talk.

Very often people suffering from an underactive chakra give up talking, they have been ignored so often that they completely lose interest in making conversation. People with such tendencies are labelled as shy and introverts. They are unable to express their feelings and are unable to hold a conversation effectively. Health-wise they may suffer from digestive problems.

It is important to activate the fifth chakra; this can be done easily by always speaking the truth. It should not matter how many people are hearing but it is very essential to express the pent up feelings.

11.8 AJNA CHAKRA

The sixth chakra of the body is the Ajna and it is also referred as the third-eye chakra. Ajna means 'beyond wisdom'. The chakra helps in opening the human mind to information which is not limited to the materialistic world and within the range of the five sense organs. It is often referred to as psychic energy because of its range. Common name for this is intuitional powers.

The brain has a tiny pinecone fashioned gland that helps in absorbing light. The pineal gland helps in remaining awake during the day and falling asleep during the night. The existence of the third eye was known even during ancient times and it was realised that this chakra helps in receiving information from external sources beyond the capacity of the sense organs.

The ajna chakra is situated in between the eyebrows. It extends till the mouth and the tip of the head. The balance of the sixth chakra helps in developing the spiritual aspects of life. The balance helps in feeling a sense of comfort in the material world as well as the physical world. The person is able to receive both physical and psychic information with ease.

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It is very rare for people to have an overactive ajna chakra. It is not easy to receive external information. In case an individual has an overactive chakra they will be spending lot of time in reading tarot card, astrology or attempt to understand the paranormal activities. People with an overactive chakra are keener in such activities than about the regular routine activities.

It is essential to balance the ajna chakra; people have to continuously remind themselves that they are a part of the earth. People need to indulge in activities which help them to be distracted from the psychic world. People sometimes suffer from an inactive sixth chakra; they are completely disconnected with experiences of the spiritual world. Health-wise they may suffer from frequent headaches and have issues such as sinus or other types of allergies.

It is not easy to energise the third eye and requires a lot of practice. Meditation and focusing on external world helps in activating the chakra.

11.9 SAHASWARA CHAKRA

The seventh chakra of the body is the sahaswara chakra and it is also referred to as the crown chakra. Sahaswara chakra means ‘having thousand petals’. This chakra helps in focusing purely on conscious energy or perception. It is not easy to explain the energy of the crown chakra. It is like magnetism. The energy felt when an iron piece is exposed to magnet. Conscious energy is present all over and forms the link with the entire universe.

Human personal consciousness is situated in the seventh chakra, but then again it stems out of the universal energy rather than anything private or individual.

The seventh chakra is situated at the tip of the head. It extends downwards till tip of the feet and upward till the end of the universe. The balance of this chakra would involve acquiring nirvana and after achieving it the individual can no longer be regarded as human. The attempts to achieve this balance is as important as finally attaining it as people attempting to achieve the chakra in the course attain happiness, overall wellbeing and wisdom.

All the attempts made towards balancing the seventh chakra help in aligning and balancing the other chakras of the body. It is not possible to have an overactive chakra since it is not possible to survive in the material world and be intimidated by the consciousness energy. There is no need to balance this chakra as it is never overactive. All humans have an underactive seventh chakra, the under activeness asserts their humanness.

All humans should attempt at balancing the other six chakras, the attempts made in activating the crown chakra should be diverted towards attaining balance of others. This can be easily done by meditation as it will help in connecting with the spiritual world and contribute towards overall wellbeing.

Check Your Progress

1. What are chakras and how the study of seven chakras helps humans?
2. List the five Jnanendriyas and five Karmendriyas.
3. Where is the Muladhara Chakra located and what does it symbolises?
4. Which chakra is also known as heart chakra and how does it helps human body?

NOTES

11.10 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Chakras are basically energy centers within the human body that help to regulate all its processes. There are seven centres of the energy where spinning takes place; the beginning point is at the bottom of the spine and travelling till the tip of the head. The study of seven chakras helps humans to understand the body's concept of general energy cycle.
2. The five jnanendriyas are ears (shotra), eyes (chakshu), skin (tvak), tongue (jivha) and nose (grahna) which help the individuals to interact with the world around them. However, the five karmendriyas are feet (pada), hands (pani), rectum (payu), genitals (upastha) and mouth (vak). The five karmendriyashelp in actions of the body, they help in maintaining contact with the external world.
3. Muladhara Chakra is the first chakra in the body. It is also referred as root chakra. The main role of this chakra is to link all the energies of the body with the Earth. Muladhara chakra is situated exactly at the foundation of the human spine, close to the tailbone. It also reaches under the belly button. The chakra symbolises 'support' as the name 'muladhara' has been derived from the words 'mula' meaning root and 'dhara' meaning support.
4. Anahata Chakra, the fourth chakra in the body, is also referred as the heart chakra. Anahata means 'unharmmed'. This chakra helps in empowering the individual's feelings of love, empathy and thoughtfulness. The chakra not only helps in loving others but promotes loving self also. For this reason the chakra is connected with wellbeing and healing.

11.11 SUMMARY

- Chakras are a part of the astral body, in yoga it is referred to as the subtle body or Linga Sharira. There are seventeen tattvas in Linga Sharira.

NOTES

- In yoga, there are eleven indriyas (sense organs), these include five jnanendriyas namely, ears (shotra), eyes (chakshu), skin (tvak), tongue (jivha) and nose (grahna).
- There are five karmendriyas, namely feet (pada) they help in movement; hands (pani) they help in agility; rectum (payu) helps in excretion of waste from the body; genitals (upastha) helps in reproduction; the fifth is the mouth (vak) helps in communication.
- The eleventh is the mind referred to as manas. There are five pranas among the seventeen tattvas, these are prana, apana, vyana, udana, samana; and the last tattva is intellect referred to as buddhi.
- The word chakra is an ancient Sanskrit word refers to wheel. It is believed that the prana or force of life rotates and spins inside the body of humans.
- There are seven chakras that help in providing accurate amount of energy to not only all the body parts but also to the mind and the soul in a healthy and stable individual.
- Sukshma Prana travels in the nervous system of the astral body or the Linga Sharira. If chakras are formed during meditation then the Sukshma Chakras is also felt while concentration and meditation.
- Muladhara Chakra is the first chakra in the human body which aims to link all the energies of the body with the Earth, this is termed as grounding.
- Svadhisthana Chakra is the second chakra in the body which is also referred to a sacral chakra. This chakra helps in establishing the identity of the humans. The chakra helps in bringing creative energy to live life to the fullest on the earth.
- Manipura Chakra is the third chakra of the body. This chakra helps in arousing the individual's self-confidence, individuality and inner strength. The chakra helps in taking decisions and making personal choices.
- Anahata Chakra is the fourth chakra in the body which helps in empowering the individual's feelings of love, empathy and thoughtfulness.
- Vishuddha Chakra is the fifth chakra of the body. It is also referred as Throat chakra. The chakra helps in voicing the personal truths of people. It provides the energy to speak.
- The sixth chakra of the body is the Ajna Chakra and it is also referred as the third-eye chakra. The chakra helps in opening the human mind to information which is not limited to the materialistic world and within the range of the five sense organs.
- Sahaswara Chakra is the seventh chakra of the body which helps in focusing purely on conscious energy or perception.

11.12 KEY WORDS

- **Astral:** It is a term related to a supposed non-physical realm of existence to which various psychic and paranormal phenomena are ascribed, and in which the physical human body is said to have a counterpart.
- **Agility:** It refers to the ability to think and move quickly and easily.
- **Plexuses:** It refers to the network of nerves or vessels in the body.
- **Spinning:** It refers to an action of rotation or causing to rotate rapidly.
- **Emotive balances:** It refers to the ability of the mind and body to maintain equilibrium and flexibility in the face of challenge and change.
- **Quiescent:** It refers to a state or period of inactivity or dormancy.
- **Cyst:** It refers to a fluid-filled sacs that occur in tissues in any part of the body.
- **Solar Plexus:** It refers to a system of nerves that is found behind the stomach.
- **Gut:** It refers to the stomach or belly, used in reference to a feeling or reaction based on an instinctive emotional response rather than considered thought.

NOTES

11.13 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Name the seven chakras and how do they help the humans.
2. What is Vishuddha Chakra and how is it activated?
3. Write short notes on the following:
 - (a) Svadhisthana Chakra
 - (b) Manipura Chakra
 - (c) Anahata Chakra

Long Answer Questions

1. Analyse the significance of the seven chakras.
2. Explain some of the exercises that are included in Sukshma Yoga?
3. Discuss Ajna Chakra and Sahaswara Chakra in detail.

11.14 FURTHER READINGS

NOTES

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BLOCK - IV
SCIENTIFIC APPROACH

Kundalini Shakti

UNIT 12 KUNDALINI SHAKTI

NOTES

Structure

- 12.0 Introduction
- 12.1 Objectives
- 12.2 Introduction to Kundalini Shakti
 - 12.2.1 Ways to Awaken Kundalini Shakti
- 12.3 Kinetic Energy
- 12.4 Kundalini Yoga
- 12.5 Mysterious Kundalini
- 12.6 Psycho-Neuro-Immunology
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- 12.8 Summary
- 12.9 Key Words
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- 12.11 Further Readings

12.0 INTRODUCTION

Kundalini Shakti is regarded as the insuperable power. The location of this Shakti is believed to be at the base of the human spine. Kundalini Shakti is a Sanskrit word and it denotes power that is coiled and resembles a sleeping snake, who coils up while sleeping. When the power is awakened the individual achieves self-awareness and enhanced spiritual perceptions. In the English language, it is understood as energy of the divine.

In this unit, you will study the aspects related to the Kundalini Shakti. This will include a discussion on the concept of Kundalini Shakti, ways to awaken it. Further, you will learn about the origins of Kundalini yoga, the relevance of the concept of Kinetic energy in kundalini yoga, the mysterious nature of Kundalini and the similarities with the concept of psycho-neuro-immunology.

12.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe the concept of Kundalini Shakti
- Discuss the ways to awaken the Kundalini Shakti
- Explain the meaning of kinetic energy

- Describe the concept Kundalini yoga
- Examine the psycho-neuro-immunology in relation to yoga

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12.2 INTRODUCTION TO KUNDALINI SHAKTI

In yogic terms, Kundalini Shakti has been referred to as supreme power and is believed to be a part of all humans. The power lies in a dormant state. The power has been mentioned in several texts based on Hinduism.

The Shakti is referred to as feminine power; it stays at the base of the spine in form of a coil. As per a dominant belief, it is mentioned that once the Kundalini Shakti is awakened, it goes up to the spine till the sahasrara so that it is united with the male power, Lord Shiva. This version is given in several religious Hindu texts, but the power is part of several other beliefs, it is just that the symbols and names are different. In all its references the power of the Kundalini is supreme, and it helps in guiding the individuals to perform in their selected paths. Besides guiding the individuals, the awakening of the Kundalini Shakti has other advantages as well, these are:

- It helps in enhancing the chakras performance and improves their balance
- It helps in connecting with consciousness of the universe
- It helps in promoting an increase in the perceiving capabilities of humans
- It encourages and stimulates psychic capabilities
- It improves spiritual understandings
- It increases brainpower
- It helps in peaceful existence
- It improves the cardiovascular and respiratory functions of the body

There are many ways of awakening the Kundalini Shakti. Let us discuss one of the ways.

- Performing yoga postures or asanas
- Practicing pranayama regularly
- The mudras need to be performed after the grace of guru has been taken. The individual needs to close their eyes, take a deep breath and make the mind peaceful and concentrate. At this point, the practitioner will become aware of the pulse and after some more time with deep concentration, energy will begin to vibrate in the veins and circulate to the muscles and other parts of the body. Most people awaken their Kundalini Shakti without actually being aware about it.

Kundalini is recognized all over the world as a profoundly respected energy that is a part of every individual's daily life. However, it is known by various titles

in different religions and cultures. In every form, it has been regarded as a celestial energy.

As mentioned earlier, Kundalini is a source of energy within the body. The Shakti is known as kundalini, as it is coiled up at the base of the spine and the goal of kundalini is to help in awakening of the slumbered internal energy. All individuals attempting to release the coiled-up energy are believed to be compensated with divine illumination and greater mindfulness. Once the energy is released from the base of the spine, it starts to flow towards the top crossing the seven chakras of human body.

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The following diagram displays the flow of the energy crossing the seven chakras of the body.

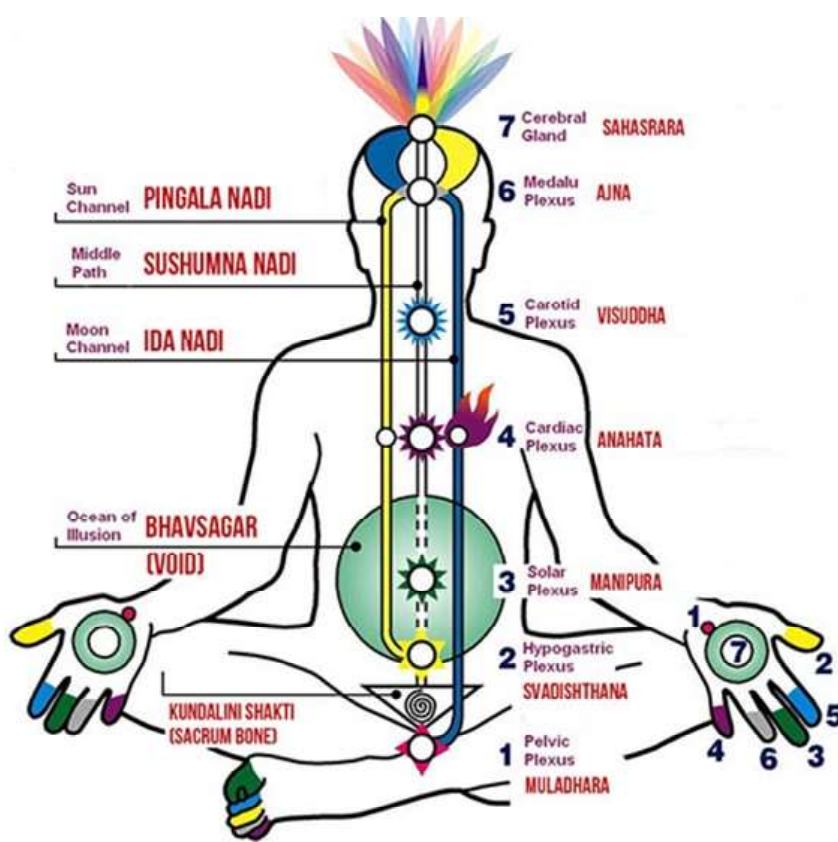


Fig. 12.1 Seven Chakras of the Human Body

The awakening of kundalini energy helps in increasing the creativity of the person and inspires emotional and spiritual balance. It not only acts as a force driving the daily functions of the body, but it also provides support to the spirit.

The practice of awakening the Kundalini developed in India more than a century ago but it became popular in the Western parts of the world during the 1960s. The yogic form of the practice helps in relieving stress and anxiousness from the body.

12.2.1 Ways to Awaken Kundalini Shakti

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There are various ways to awaken Kundalini Shakti. One can meditate, do gentle breathing exercises, use visualizations, practice yoga postures, undertake energization exercises, chant, etc. This may through silent meditation, Sudarshan Chakra kriya, Kirtan Kriya, or Anulom Vilom pranayama. As explained earlier, the kundalini is awakened by using the technique of kriya, in this the primary focus is on the breathing. Individuals can follow this technique at the comfort of their home; the practice requires a room where there is no external noise and other sources of distraction.

The technique starts by taking a deep breathe into the spine's tailbone. The breathing should be directed towards the tip of the head. The focus of the breathing should be to move in the upward direction. In the subsequent breathing cycle, the individual needs to take a deep breath focusing on the third eye and directing it downwards towards the throat and heart. After the two cycles of breathing are established, energy should be activated with the help of a chant, chanting needs to be done while inhaling as well as exhaling.

This kriya helps in releasing tension and stress from the body and also in releasing the Kundalini Shakti located at the base of the spine.

Listed below are some of the factors that help in the awakening the kundalini energy in the body:

- Attention on the breathing is an important aspect of all forms of meditations. The breathing has to start from the tailbone at the spine and move upwards towards the tip of the head.
- Maintaining the correct posture is important throughout the practice. The spine needs to be erect while breathing and the head should be pointed upward, in the direction of the room's ceiling.
- Focusing on positive features of life helps in improving the focusing powers.
- Eating nutritious food is also important for awaking the power, as food has a direct impact on the overall health. It is recommended to eat plant based organic diet.
- Regular exercise adds flexibility and improves breathing.
- Emotional strength is important for the practice; individuals should try to keep negative emotions away.
- Keeping positive and compassionate company helps in circulation of positive vibes all the time.
- Appointing a mentor helps in improving the experience of awakening the kundalini.

- Regular chanting helps in awakening the energy.
- Taking time for indulging in hobbies and personal interest helps the mind to relax and relaxing the mind is very essential for meditation. Taking time out of the mundane routine to do things of personal interest is important for developing a healthy mind.
- Living in the present and not worrying too much about the future helps in focusing better on the task at hand. Being conscious about ones' surroundings is essential for the practice of kundalini.
- Taking life easy and not worrying too much about the future is important reducing the stress. Though it is essential to plan for future, but sometimes extensive planning takes the adventure out of the daily routine life and leads to monotony. This kills the creativity and spirit of the mind.
- Individuals need to be compassionate towards people around them but at the same time they need to have self-compassion. Kundalini practice will be useless in case the individual does not take out time and appreciate themselves for their talents and blessings.
- Staying away from modern age distractions is essential for meditation. Individuals need to be able to focus on their inner self and for this it is important to not spend too much time watching television and use of other distractions like internet and cell-phones have to be limited.
- Music helps in relaxing the mind. Relaxed mind is very essential for awakening of kundalini. Mind can be relaxed by listening to soothing music; this also helps individuals to concentrate during the practice of meditation as relaxed mind is able to focus well.

The Kundalini Shakti cannot be released in a hurry, patience is required. In some cases, it takes several attempts to release the energy. Attempting the practice is more important than awaiting its success. Regular practice helps in attaining perfection.

12.3 KINETIC ENERGY

The motion of the object is possible because of the kinetic energy. In physics, the kinetic energy is defined as the effort required to increase the speed of an object in relation to its weight and existing speed. After acquiring the desired speed, the kinetic energy of the object remains constant till the time the speed is constant.

Energy appears in the following states: potential or kinetic state. The electric energy in the wiring can be in both the states, when the electric bulb is giving light, it is said to be in its kinetic state and once the bulb is switched off the energy is in potential state. The energy is available in potential state till needs to be used again.

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In the same way the human body has the in-built power of anxiety, resentment and stubbornness, which when not in use it is in the potential state and once this power is used it transforms into the kinetic state. The state it resides in the body is completely the personal choice of the individual. The conscience of the mind also referred to as 'buddhi' in Sanskrit, states a specific thought or 'shreya', as the form of energy and this enables the individuals to accomplish the goals of their life. The goals will be accomplished once the energy is transformed to kinetic energy. The transformation will happen only when individuals take the necessary actions for the fulfilment of their goals.

Emotions like anxiety, resentment and self-indulgence may not always be essentially immoral or destructive, it is essential to handle such emotions in a skilful manner. Sometimes these emotions prove to be resourceful. When the 'buddhi' is able to identify these emotions as just personal ego that is coming in conflict with the individual's internal intelligence (referred to as 'preya'), they are expected to relinquish their connection with such emotions. By doing this, the inherent strength may change and can be reserved for usage in the future.

According to laws of physical science, it is not possible to create or destroy energy and it can only be converted. Observing yoga to be a complimentary part of physical science, many experiments were undertaken by the ancients in order to control, conserve and transform the energy used in thoughts. As a result of repeated trials and learnings, they realised that by renouncing any one of the desires even monetarily will alter the form of the energy.

After understanding this process, the importance of the thoughts can be realized. Every individual is capable of using the refined process so that the thoughts, desires and emotions can be transformed. Once the buddhi is able to recognise the occurrence of destructive and impractical power, the practitioners of yoga are able to transform this power constructively with the help of the refining processes. The conscience is always present to guide individuals about the ill-effects of always giving into 'preya'. Individuals in the habit of giving into their preya are bound to experience not only emotional or spiritual discomfort but also physical disease.

Each and every thought, expression and action convey a spiritual meaning. It is a recognized fact that all human actions are fuelled by the human desire. Sages from ancient times developed a formula with scientific logic. According to the formula $D = E + W + C$. As they felt that composition of desire had three primary constituents, namely energy, will power and lastly the conscience. When all human thoughts are in alignment, the thoughts, expression and actions of the 'buddhi' are bound to be beneficial and will serve the 'shreya'. Once they will readily and knowingly submit their attachment to the purely pleasant, contented, accustomed and attractive 'preya', nothing valuable will be lost. The essential power of the 'preya' will not be lost for the individual rather the willing sacrifice will spontaneously convert the 'preya' into reserved inner energy and determination. This will open the path in the mind which will be superconscious providing immense celestial instinctive wisdom and vision.

On the other hand, when individuals do not act according to the advice of the 'buddhi' and give into their ego, there is bound to be an internal conflict between thought, expression and actions. This will diminish the reserved inner energy, the willpower and creativity.

The present culture is constantly facing the problem of individuals having weak will-power and as a result, all their intelligence and decision-making powers are of no use. Since these individuals are accustomed to aiding the narrow perspective of the ego, intellects and subconscious mind, their willpower reserves have become depleted. In the absence of enough willpower they are not able to exert refinement; they have depleted the stock of mindfulness as well as energy. When the reverses are frequently depleting and maintained at such low levels there is bound to be excessive tension, increased levels of stress, nervousness, fatigue and discomfort.

The way people's bank statements reflect their deposits and withdrawals and indirectly their complete responsibility for their state of wealth or economic failure, similarly their mental state is completely in their hands. In today's world they need abundant stock of energy, determination and mindfulness in order to fulfil their responsibilities and accountabilities. The accountability is towards the family, colleagues, friends, society, environment and most importantly towards self. The yogic science helps in teaching individuals that happiness and healthy living is completely dependent on their thinking process, emotional state and wishes. An arranged source of power comes up in every individual's routine life in the shape of anxiety, rage and egotistical desires. In case the individual is able to use this power kinetically in the current situation, in such a situation they are able to knowingly preserve and transform the usage for next time. The science of yoga suggests methodical and logical techniques to preserve and transform the energy. The techniques are not difficult; all the individuals have to do is direct their attention in the right direction and be guided by their internal instinctual wisdom.

Check Your Progress

1. How does the power lie in the human body as per the Kundalini yoga?
2. Name the states in which energy appears.
3. What are the individuals in the habit of giving into their 'preya' bound to experience?

12.4 KUNDALINI YOGA

Kundalini Yoga refers to a school of yoga. It has a deep influence of Shaktism and Tantra School of Hinduism. It is known as Kundalini yoga as the main focus of the practice is to awaken the kundalini energy. The practice uses various methods such as mantras, tantra, meditation etc. in order to awaken the Shakti. This form

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of yoga is believed to be dangerous since various understated energies are involved in its practice.

The yoga form in the present time has become a synthesis of several traditions and it also includes techniques of hatha yoga's bandha, pranayama, and various asana. The practice has techniques of Patañjali's Kriya Yoga, this consists of self-control, self-study, and dedication to God, and kundalini form involves the tantric conception and incorporates the techniques of meditation from the Laya yoga, also called samsketas. All these help in awakening the Kundalini Shakti.

Laya could be referred to as a technique of yoga as well as its impact; it absorbs the individual in a celestial state. The word laya is a Sanskrit term and it means 'closure', 'loss', or 'captivation', Laya yoga is often referred to in the connection to other forms of yoga namely *Tattva-Upanishad*, the *Varaha Upanishad*, the *Goraksha Paddhati*, the *Amaraugha-Prabodha*, and also the *Yoga-Shastra* of Dattatreya. It is difficult to differentiate between various forms of traditional yoga because they have a lengthy lineage of historical syncretism; therefore, several earliest sources about Kundalini yoga have been derived from the instructions belonging to the traditions of the Tantric and Hatha yoga, these include *Hatha Yoga Pradipika* and the *Shiva Samhita*. The Shiva Samhita defines the practiced yogi as performing 'the four yogas' in order to attain the awakening of kundalini whereas minor practitioners can merely follow only one form of yoga, out of the four yogas. The four forms of yoga included in the Shiva Samhita for awakening kundalini are, Mantra Yoga and Hatha Yoga, Laya Yoga and the Raja Yoga. It is free from dualism.

The term Kundalini has been derived from the Sanskrit adjective 'kunda lin' meaning 'circular, annular'. Though it is used as a noun because of its context of a snake and how it is found in a coiled-up state, the reference is from the *Rajatarangini*, a chronicle of the twelfth century. The word 'kunda' has been used in its noun form in the *Mahabharata*; it means a bowl of water. The female ku ali means a 'ring or a bangle'. During the eleventh century, in classical Sanskrit, the word was referred to as a coiled rope and for this reason the Shakti has been synonymous to being serpent-like. During the fifteenth century, the concept was implemented as 'ku alni' in the Hatha yoga and following this by the sixteenth century, it became to be extensively used in the Upanishads of yoga.

Kundalini yoga has many forms of kriyas and meditations, the practice of these helps in raising the awareness of overall body especially the nervous system, and mind so that the body is able to deal with the rising of kundalini energy. The focus is mainly on the actions of naval, spine and selective points of the body. Breathing is also essential in helping the rise of the energy. The correct breathing technique helps in directing and controlling the movement of Kundalini towards the upper centres of the body.

The yoga involves easy methods of breathing and these not only help in awakening the kundalini energy but most importantly they help in cleansing of the

nadis and other pathways. In earlier times practice of yoga was considered as a path for enlightening the soul and the mind, but today several people have begun to practice yoga in order to relieve their anxiousness and reduce their stress levels so that there is overall well-being. The ones still interested in enlightenment continue to practice Kundalini Yoga. Breathing techniques in the yoga practice such as pranayama are considered to be closely connected with kundalini meditation as the control of breath helps in unlocking the energy within the body.

Kundalini Yoga involves steps physically adopted in order to attain greater awareness and awakening of the energy.

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12.5 MYSTERIOUS KUNDALINI

As discussed in the previous section, Kundalini is a quiescent spiritual energy, frequently referred to as a coiled serpent found at the bottom of the human spine. The serpent safeguards the entry of susumna, the dominant channel of energy, preventing the prana energy to enter and ascends towards the centre of the spine while crossing the chakras of the body. Kundalini is regarded as the converted form of celestial female spirit of Shakti, the contrasting pole and the male counterpart being the Shiva, it exists in in the pinnacle chakra. There are essentially two ways of attaining enlightenment in yoga. The first is the traditional way of controlling the instabilities of the mind and prana by focusing, concentrating and meditating. The second way is of following the path of tantrism which involves uncoiling the serpent so that the kundalini can be released. The energy rises upward through the channel of susumna, crossing all the chakras of the body. This helps in uniting the Shiva and Shakti together.

Once the kundalini is created a definitive state of contentment is activated. Kundalini should be released once all the crucial preparation has been done, it can prove to be very disastrous in case released without proper preparation. The delicate system of the body will not be able to handle the kundalini energy and it may cause severe pain and even senselessness and death. The power should be released only after the mind and the body is ready for it. The body can be ready only after it has been practicing the exercises followed in hatha yoga. To start with, the channels of energy should be cleansed, and physical strength of the body should be enhanced. Once this is done with the help of meditation and breathing exercises, the chakras of the body should be activated. After these two are achieved, the practitioners will have control over their breath and prana and thus they will be ready for the awakening of the kundalini without harming themselves. As mentioned earlier, the awakening takes place by adopting various techniques of yogic practices, these include, chanting of mantra, tapas, meditation, pranayama, mudra, and self-submission.

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Even after following the above steps the process of awakening may affect the individual in an adverse manner. This happens due to the movement of kundalini which tries to adjust within the body and most of all the nervous system. The process increases the psychic energy. For this reason, it has been advised that the attempts to activate the Shakti should be administered under the supervision of an expert. The life of the yogi completely changes after the kundalini is stimulated. The entire process need not be followed as the purification of nadis, mind and other parts of the body along with the strengthening of chakras is sufficient for attaining overall wellbeing and internal calm.

12.6 PSYCHO-NEURO-IMMUNOLOGY

During the 1970s, Robert Ader and Nicholas Cohen at the University of Rochester undertook studies and coined the term ‘psychoneuroimmunology’ for the first time. Their studies were same as the Pavlovian study wherein the dogs would begin to salivate by merely hearing the bell ringing. They both studied the immune systems of rats, the rats were fed with water that was infused with saccharine and Cytoxan (nausea inducing drug), and the consumption of such infused water made the rats to fall sick. Subsequently they were fed with water containing only the saccharine. Even after the Cytoxan was removed, the rats continued to exhibit same symptoms, this established the fact that immune system continued to react in the same way due to its effect on the nervous system.

The study was given a further impetus by Dr. Candace Pert. Initially her work concentrated on the brain’s neuropeptide receptors and the immune system of the body. She discovered that receptors were not just present in the brain but could be found in other parts including the muscles and glands of the body. There was a complete network of nerves leading to the immune system’s blood vessels and cells. Providing the cells with a memory power and intellect of their own. She used Multiple Personality Disorder (MPD) to be an illustration of mind having power over the rest of the body. With her research she tried to imply that mind and body are directly linked with emotions. Applying this link, she claimed that happiness is a state of mind and furthering her claim by tying spirituality into her research of body and mind undercurrents. She claimed that good health and long life are connected with mindfulness and wisdom. According to her these two qualities can be developed with the help of meditation. Meditation is a form of yoga, which in the East is accepted as technique for overall wellness. Meditation helps in attaining peace of mind. By meditating, people are able to understand their inner-selves and help in understanding the input given by the senses. With regular practice, meditation helps in learning the art of controlling thoughts, reasonably reduces the development of negative thoughts. This is possible due to the increased control over the emotions and state of mind. This control helps in overall wellbeing as it keeps ailments related to nervous system at bay.

Check Your Progress

4. Which schools of Hinduism have a deep influence on Kundalini Yoga?
5. Mention some of the sources from which Kundalini yoga has been derived.
6. Who coined the term 'psycho-neuro-immunology'?

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12.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The power lies in a dormant state as per the Kundalini yoga.
2. Energy appears in the following states: potential or kinetic state.
3. Individuals in the habit of giving into their prey are bound to experience not only emotional or spiritual discomfort but also physical disease.
4. Kundalini yoga has a deep influence of Shaktism and Tantra School of Hinduism.
5. Kundalini yoga have been derived from the instructions belonging to the traditions of the Tantric and Hamha yoga, these include *Hatha Yoga Pradipika* and the *Shiva Samhita*.
6. Robert Ader and Nicholas Cohen at the University of Rochester undertook studies and coined the term 'psycho-neuro-immunology' for the first time.

12.8 SUMMARY

- Kundalini Shakti is regarded as the insuperable power. The location of this Shakti is believed to be at the base of the human spine. Kundalini Shakti is a Sanskrit word and it denotes power that is coiled and resembles a sleeping snake, which reflects the image of a snake which while sleeping coils up.
- Kundalini is supreme, and it helps in guiding the individuals to perform in their selected paths. Besides guiding the individuals, the awakening of the Kundalini Shakti has other advantages as well
- The Shakti is referred to as feminine power; it stays at the base of the spine in form of a coil. As per a dominant belief, it is mentioned that once the Kundalini Shakti is awakened, it goes up to the spine till the sahasrara so that it is united with the male power, Lord Shiva.
- As per a dominant belief, it is mentioned that once the Kundalini Shakti is awakened, it goes up to the spine till the sahasrara so that it is united with the male power, Lord Shiva.

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- Kundalini is a source of energy within the body. The Shakti is known as kundalini, as it is coiled up at the base of the spine and the goal of kundalini is to help in awakening of the slumbered internal energy. All individuals attempting to release the coiled-up energy are believed to be compensated with divine illumination and greater mindfulness.
- The awakening of kundalini energy helps in increasing the creativity of the person and inspires emotional and spiritual balance. It not only acts as a force driving the daily functions of the body, but it also provides support to the spirit.
- There are various ways to awaken Kundalini Shakti. This may through silent meditation, Sudarshan Chakra kriya, Kirtan Kriya, or Anulom Vilom pranayama.
- The Kundalini Shakti cannot be released in a hurry, patience is required. In some cases, it takes several attempts to release the energy. Attempting the practice is more important than awaiting its success. Regular practice helps in attaining perfection.
- The motion of the object is possible because of the kinetic energy. In physics, the kinetic energy is defined as the effort required to increase the speed of an object in relation to its weight and existing speed. After acquiring the desired speed, the kinetic energy of the object remains constant till the time the speed is constant.
- The human body has the in-built power of anxiety, resentment and stubbornness, which when not in use it is in the potential state and once this power is used it transforms into the kinetic state. The state it resides in the body is completely the personal choice of the individual. The conscience of the mind also referred to as 'buddhi' in Sanskrit, states a specific thought or 'shreya', as the form of energy and this enables the individuals to accomplish the goals of their life.
- It is difficult to differentiate between various forms of traditional yoga because they have a lengthy lineage of historical syncretism; therefore, several earliest sources about Kundalini yoga have been derived from the instructions belonging to the traditions of the Tantric and Hamha yoga, these include *Hatha Yoga Pradipika* and the *Shiva Samhita*.
- Once the kundalini is created a definitive state of contentment is activated. Kundalini should be released once all the crucial preparation has been done, it can prove to be very disastrous in case released without proper preparation.
- Meditation is a form of yoga, which in the East is accepted as technique for overall wellness. Meditation helps in attaining peace of mind. By meditating, people are able to understand their inner-selves and help in understanding

the input given by the senses. With regular practice, meditation helps in learning the art of controlling thoughts, reasonably reduces the development of negative thoughts.

Kundalini Shakti

12.9 KEY WORDS

- **Kundalini Shakti:** It is a Sanskrit word and it denotes power that is coiled and resembles a sleeping snake, reflecting the image of a snake which coils up while sleeping.
- **Chakras of the Human Body:** It refers to the seven focal points in the subtle body used in a variety of ancient meditation.
- **Shakti:** It is referred to as feminine power.
- **Kinetic energy:** It is defined as the effort required to increase the speed of an object in relation to its weight and existing speed.
- **Susumna:** It is a Sanskrit word meaning ‘very gracious’ or ‘kind’ and is also the name for the central nadi in the body; the dominant channel of energy.

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12.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is Kundalini energy?
2. List the advantages of awakening the Kundalini Shakti.
3. Briefly mention one way of awakening the Kundalini energy.
4. What are the seven chakras of the human body?
5. Write a short note on the application of kinetic energy in Kundalini yoga.
6. How is psycho-neuro-immunology related to yoga?

Long Answer Questions

1. Describe the factors that help in the awakening the kundalini energy in the body.
2. Discuss the origin of Kundalini yoga.
3. Examine the relation between ‘buddhi’, ‘shreya’ and ‘preya’.
4. ‘The energy rises upward through the channel of susumna, crossing all the chakras of the body. This helps in uniting the Shiva and Shakti together.’ Explain.

12.11 FURTHER READINGS

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UNIT 13 MEDITATION AND PHYSIOLOGICAL CHANGES

NOTES

Structure

- 13.0 Introduction
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- 13.2 Psychological and Physiological Benefits
- 13.3 Physiological Changes During The Practice of Meditation
- 13.4 Answers to Check Your Progress Questions
- 13.5 Summary
- 13.6 Key Words
- 13.7 Self-Assessment Questions and Exercises
- 13.8 Further Readings

13.0 INTRODUCTION

Yoga is an ancient Indian way of life, which includes changes in mental attitude, diet, and the practice of specific techniques such as yoga asanas (postures), breathing practices (pranayamas), and meditation to attain the highest level of consciousness. Since a decade, there has been a surge in the research on yoga and meditation, but we do find very few reviews regarding yogic practices and Transcendental Meditation (TM) in health and disease.

When a person practices yoga, with yogic attitude (attitude of patience, persistent practice, overcoming obstacles within self, that is, trouncing laziness, anger, delusion and desire for being different or better than others), there are several changes in physiology. In this unit, we will discuss the various psychological and physiological benefits of yoga along with the physiological changes during the practice of meditation.

13.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe the psychological and physiological benefits of yoga/meditation
- Discuss the effects of meditation on oxygen metabolism and respiration
- Explain the effects of meditation on endocrine, hormones and neurotransmitters

- Discuss the different functions of yoga forms

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13.2 PSYCHOLOGICAL AND PHYSIOLOGICAL BENEFITS

Yoga is considered as a unique form of exercise. The practice of yoga not only has mental benefits but it also provides the body relief from several physical and emotional ailments. It is a practice of mind and body that is known to have spiritual benefits as well. Yoga helps in effectively developing a better self-understanding, recognition, and the capability to face the current moment. Yoga helps in reducing stress and improves the physical performance of individuals. It is a physical activity that can be done by people of all age groups and can be continued for the entire life-time. Yoga can be performed by people with strong as well as weak fitness levels. It is regarded as a strategy for maintaining physical strength, suppleness, equilibrium, all through the life.

- Practicing yoga reduces the blood pressure
- There is a reduction in heart-rate in a rested state
- Reduces cholesterol
- Aids in dropping the levels of glucose in the blood
- Helps in improving the body's lipid profile
- Reduction in inflammatory indicators
- There is an improvement in the endothelial functions of the body
- Helps in weight reduction
- The practice of yoga helps in improving the ratio between the waist and hip measurements
- Increases overall physical strength
- Increases the stability of the core muscles
- Enhances balance
- Helps in improving the functioning of the lungs as involves several breathing techniques
- Enhances the control over breathing
- Improves immunity of the body
- Lessens the tension of the muscles
- Helps in treating chronic aches such as backache and headache
- Mental health of the body also improves by practicing yoga
- Yoga improves the ability to concentrate

- Helps in focusing better
- Mental precision is enhanced
- Improves presence of mind

Psychological benefits of yoga are many as it improves the emotional and mental health:

- Yoga helps in inducing peaceful feel as a result the mental health improves
- Helps in reducing anxiousness and impact of negative thoughts
- Reduces depression
- Induces an overall feeling of healthiness
- There are positive moves in locus of control
- Helps in coping with difficult situations

There are several physiological benefits of yoga:

- Yoga helps in improving the pattern of sleep
- Leads to weight loss
- Increases the vigour of the body
- Immune system improves with practice of yoga
- There is a drop in the pulse rate and controls the blood pressure
- Improves memory
- Reduces the mood swings
- Helps in improving the skills of socialising
- Posture of the body improves and provides stability along with flexibility to the body

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13.3 PHYSIOLOGICAL CHANGES DURING THE PRACTICE OF MEDITATION

Meditation as an alternative therapy has become increasingly popular. Traditionally it was associated closely with practicing spiritual activities. The practice was common amongst the earlier Jewish and Christian spiritualists; it was even regularly practiced by monk in Buddhism and Hindi gurus. The purpose of practicing meditation by all these individuals was to attain a complete or holy state of mindfulness, in which they are able to surpass the real world, have a clear understanding of reality and to be able to connect with the divine power. In today's world, meditation is no longer practiced for just these reasons, on its own it is regarded as an effectual method of treating depression and lessening the levels of

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stress. It is essential to treat these as untreated they could become a cause of serious ailments such as hypertension. Moreover people practicing meditation on a regular basis have been able to achieve positive state of mind and have experienced an improved state of life. There is enough evidence to establish that meditation helps in curing patients suffering from chronic problems. In one of the studies it was established that meditation helped in faster recovery of patients suffering from psoriasis. Today it has become a standard means in psychotherapy and it is used as a technique for relaxing patients. Meditation also helps in stimulating awareness.

The research about techniques of meditation has been going on for over five decades. Its success and effectiveness was presented in form of several case reports however they were not considered substantial for establishing the benefits of meditation on the health. All this has changed in present times, the physiological and psychological benefits of meditation are many and as a result it has been readily accepted as an effective therapy technique in medical field. In order to completely understand its benefits it is important to realise the particular way its effects the physical and the mental health of the individuals. Meditation in present times has been able to establish itself as an effective tool for therapies and physiological changes occurring during its practice.

It is essential to realise that there are several techniques of meditation and all its variations are considered as tools for therapies. Although in all its variations and forms few aspects always remain constant; these are:

- A peaceful environment
- The posture should be correct and should not cause discomfort.
- Focus has to be maintained with help of a device which helps in maintaining a rhythm, this can be in form of a chant or mantra or even breathing deeply.
- The mind should be allowed to freely wander but it should not concentrate or dwell on a specific thought.

The commonly used techniques for meditation include Transcendental Meditation (TM), Hatha yoga, and several practices familiarized by Herbert Benson while undertaking his study on “relaxation response”. All the techniques help in benefiting the mind and body, individual can select the technique that suits them the most.

Physiological Changes

The body does not require making a conscious effort in order to adapt to changes occurring due to the individual’s temperament or environment. On feeling cold the shivering is natural change, the heart beat become fast while running; nervousness causes the hands to become cold. These changes are not consciously happening

they happen automatically. Nonetheless, these automatic actions can also be influenced by making a conscious effort. In 1969 Neil E Miller with his research proved that automatic functions of the body can also be conditioned. In order to confirm his results he conducted his conditioning techniques on rats and was able to change their spontaneous tasks with a help of a system of rewards. For example, the rat was rewarded edible treat only once it dropped the heart rate. The rats trained themselves to regulate their heart rate that is a spontaneous function as they were rewarded for the action. The study provided the groundwork for biofeedback, and the people were able to alter their automatic functions such as heart-rate, blood pressure, temperature of the skin and several metabolic functions when they were provided with information pertaining to these functions and deliberately attempted to change them. Techniques like these were mostly studied so that improved methods could be developed in order to treat hypertension and other heart related diseases.

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Effects of Meditation on Oxygen Metabolism and Respiration: In 1970s when the biofeedback studies were conducted Herbert Benson realised that the systolic blood pressure of the subjects was lessening not because of the biofeedback equipment rather the reduction was because these subjects were attempting to think of peaceful thoughts so that their minds could relax. Herbert started to develop techniques in order intentionally decrease blood pressure. Benson began to review several older researches that has been focused on impact of meditation. One such study was conducted by B. K. Anand, the study was about an Indian yogi who was able to reduce his oxygen metabolism by choice. There were other reports of monks in Japan; they were able to decrease the consumption of oxygen with the help of meditation. The reduction was almost twenty per cent; Benson also found that Americans practicing TM could decrease the oxygen consumption by almost twelve percent. Subsequently later it was found that practicing TM could help in dropping the consumption to forty per cent and respiratory rate dropped to fifty per cent. It was also realised that meditation helps in reducing the sensitiveness to carbon dioxide. In view of these studies and their results meditation can be compared to a state of hypo-metabolism, the state during sleeping and resting. Meditation has a very special psychophysiological pattern.

With enhancement in researches about effects of meditation on body organs, tissues and cells it has been realised that meditation in the long run helps in lessening the arterial lactate levels. In another research it was found that there is a twenty percent enhancement in phenylalanine concentrations. The reasons for changes in the metabolic levels is not clearly understood, they could be linked with the particular hypo-metabolic functioning distinct from sleep and rested state.

Meditation affects the flow of blood: According to researches meditation helps in reducing the blood flow in the kidneys and liver since there is an increase in the

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blood flowing to the muscle, skin, and the brain. Advanced research established that the increase of the flow was mostly in the brain as that muscle and skin blood flow was not affected by the decrease in liver and the kidneys. Meditation helps in reducing the systolic blood pressure. Individuals practicing meditation regularly for a long period of time have experienced a change in the level of their blood pressure. The control on blood pressure has helped in lowering the risk of other cardiovascular diseases among these practitioners.

Meditation and autonomic functioning: Individuals practicing meditation have experienced an increase in the galvanic skin resistance (GSR), and while the impulsive electro-dermal response (EDR) has decreased, there are several reports that suggest a speedy recovery of GSR. All these calculated influences of meditation on skin resistance advocate a reduced sympathetic activity and this helps in feeling relaxed most of the time.

Meditation helps in reducing the heart rate, though the results vary among practitioners. The relaxed state helps in reducing the heart rate while the individual is meditating. Though there are a few cases that have exhibited an increase as well. There are several reasons for varied results among practitioners, some of them are mentioned below:

- The level of experience of the practitioner
- The state of consciousness of the practitioners vary
- The duration of the meditation
- Anxiety levels of the meditators may vary

Effects of meditation on endocrine, hormones and neurotransmitters: There are many cases where the meditators have experienced an impact on the adrenocortical activities while meditating. Regular and long-term practice helps in reducing the levels of cortisol and ACTH. Further it has been established in recent times that thyroid stimulating hormone and secretion of growth hormone lessens as a result of meditation post experimentally-induced stress. After measuring the levels of the urinary metabolite of serotonin 5-HIAA pre and post meditation it was found that there was a significant increase among the practitioners, even higher in regular and experienced practitioners. Meditation helps in increasing the levels of arginine vasopressin, these are essential for developing concentration and enhancing memory. Additionally, in recent times researches have established that meditation has an impact on the levels of beta-endorphin and hormones releasing corticotropin, melatonin, dehydroepiandrosterone sulfate (DHEA-S), and several other hormonal changes simulating gamma aminobutyric acid.

Meditation and electroencephalography (EEG): The researchers are able to study the activities of the brain with the help of the electroencephalography (EEG).

It has been to study minds of people in a state of meditation. The results of these researches showed that there is an increase in the sluggish alpha activity in central and front sections, the front section experiences a high voltage theta burst of activity. Beta and delta activity are usually reduced or there is no change. The individuals in a sleeping, resting and meditating state have been compared with the help of the EEG, the individuals in the meditating state showed amazing image and activity of the brain. For instance, continuing practitioners in state of meditation produced theta-burst activity, while nothing of this phenomenon was noticed among the individuals in a resting or sleeping state.

EEG is also frequently used to quantify the synchrony of the brain. This helps in understanding the clarity and creativity of the thoughts. Long term meditation has helped in significantly increasing the synchrony. EEG helps in understanding the physiological impact of meditation on the brain.

In the previous section it was stated that meditation helps in decreasing the blood flow in the kidneys and the liver. On the basis of this Jevning theorized that this would result in increasing the cardiac output thus the flow of blood to the brain will also increase. In order to measure CBF, Jevning applied the rheoencephalography (REG). The electrodes used in this method helped in collecting the data on blood flow in the central and front areas, these are also considered as the areas which are activated while practicing meditation. As anticipated, the group practicing meditation had far higher CBF in these areas as compared to those in a normal rested state. The higher flow of blood encourages increase in the level of activity, the study helped in establishing that meditation and sleep are not the same. The brain is in a state of alertness during meditation but at the same time it is relaxed. This is not same as sleeping. The brain activities are also measured with the help of positron emission tomography and fMRI. Although these techniques are not used frequently in measuring the effects of meditation on the brain as they are expensive.

In one of the studies fMRI was used in order to scan the activities of the brain during meditation, this helped in measuring the CBF far more accurately. The study was conducted by Herbert Benson. The outcome of the study displayed stimulation in neural structures concerning attention these were lateral prefrontal and parietal areas and autonomic control, pregenual anterior singulate, amygdala, midbrain and hypothalamus. Few extra areas of stimulation were recognized in the putamen, precentral and postcentral gyri and in the structures of hippocampal/ parahippocampal. Additionally a universal reduction in the CBF was observed in practitioners while meditating.

Numerous studies have been conducted over the years in order to identify the changes in the activity of brain due to meditation. The researches may help in

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spreading awareness about the benefits of meditation. Meditation helps in reducing the stress levels, controlling hypertension and improves overall health. These researches have time and again proven that stress is the cause of most of the problems related to the brain. Meditation as a practice is able to influence the processes of the brain. There is enough evidence to establish that meditation is a therapeutic tool that helps in psychotherapy. It is not only being recognised by patients but also several medical practitioners recommend it to be a cure for several physiological disorders. In some of the ailments it is not an alternative cure but it is considered as the primary treatment for the ailment.

13.3.1 Balance of the Body

The postures of yoga have to be studied closely before execution. The postures require complete concentration and balance. The practice is known to improve the working of all the systems and organs of the body, as there are various asanas and kriyas that focus on specific parts of the body. They help in providing suppleness to the spine and the joints. Yoga helps in toning the muscles, glands and inner parts of the body. While executing the asanas the breathing has to be perfect. There is no doubt that yoga helps in providing spiritual growth and enhances the quality of life. As explained earlier yoga not only helps in increasing the muscular flexibility but at the same time it treats and sometimes cures the chronic disorders. Yoga helps in attaining internal calm. The asanas and pranayama helps the individuals to lead a balanced life.

Balance, flexibility, swiftness, synchronization, and strength are essential for living a healthy life. In yoga balance is required not while holding a posture but more while the movements is changed and adjusted in a posture. It is important to master the transition and develop the strength to prevent injury. Balance and coordination is most important during this time. Different muscles are used while practicing various postures of yoga. For instance according to the study in electromyography (EMG), the toes are most activated while postures involve standing and the lower leg muscles are also completely active, thus, it is important to target the basic muscles that will help in maintaining balance.

Yoga forms have different functions, few forms help in relaxing and in some the movement of the body is more. In all the forms it is essential to master the asanas and concentrate on the breathing.

- **Yoga for suppleness:** Postures of yoga help in increasing the flexibility of the body. The postures of yoga stretch the muscles, this helps in relieving stiffness and general tiredness of the body. According to a study on yoga it was realised that practice of yoga helps in improving flexibility up to forty percent.

- **Yoga for strength:** Some of the yoga forms like the ashtanga and power yoga require tremendous amount of physical strain, practicing such forms is bound to improve the overall strength and toning of muscles. The yoga form need not be energetic yet it helps in improving the physical strength and improves resistance. Iyengar or hatha yoga helps in improving physical strength tremendously. There are some postures like “plank” which help in building the strength of the upper body. The key to all the benefits is to be able to perform the posture correctly.
- **Yoga for good posture:** Yoga helps in improving the body Posture. The physical strength acquired during the practice of regular yoga forms helps in making the body flexible. The agility helps in holding the correct posture in daily life. The awareness of the body is also enhanced by practicing yoga. It becomes easy to notice the sagging and drooping of the muscles.
- **Yoga for better breathing:** All postures of yoga require attention on the breathing pattern. The correct breathing pattern will provide the required benefits of the yoga and lead to relaxation. The particular technique for breathing has to be mastered in yoga. If performed properly yoga helps in increasing the lung power and aids in curing asthmatic patients.
- **Yoga for reducing stress and peaceful mind:** Yoga helps in reducing the stress levels as it improves the blood flow in the body. Reduced stress will help in providing peace of mind as well. Meditation helps in calming the mind.
- **Yoga for good heart health:** As stated in the previous section, yoga helps in improving the blood flow in the body especially in the brain. This leads to lowering of the blood pressure as well as the heart rate. People suffering from hypertension should practice the yoga forms which aid in lowering the blood pressure. Meditation also helps in lowering the blood pressure. It is known to reduce the levels of cholesterol and triglyceride in the body. Yoga improves not only physical balance of the body but also the physiological balance.

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Check Your Progress

1. State three psychological benefits of yoga.
2. What are the commonly used techniques of meditation?
3. State the essentials for living a healthy life.

13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. Psychological benefits of yoga are many as it improves the emotional and mental health:
 - (i) Yoga helps in inducing peaceful feel as a result the mental health improves
 - (ii) Helps in reducing anxiousness and impact of negative thoughts
 - (iii) Reduces depression
2. The commonly used techniques for meditation include Transcendental Meditation (TM), Hatha yoga, and several practices familiarized by Herbert Benson while undertaking his study on “relaxation response”.
3. Balance, flexibility, swiftness, synchronization and strength are essential for living a healthy life.

13.5 SUMMARY

- Yoga is considered as a unique form of exercise. The practice of yoga not only has mental benefits but it also provides the body relief from several physical and emotional ailments.
- Yoga can be performed by people with strong as well as weak fitness levels. It is regarded as a strategy for maintaining physical strength, suppleness, equilibrium, all through the life.
- Meditation as an alternative therapy has become increasingly popular. Traditionally it was associated closely with practicing spiritual activities. The practice was common amongst the earlier Jewish and Christian spiritualists; it was even regularly practiced by monk in Buddhism and Hindi gurus.
- The research about techniques of meditation has been going on for over five decades. Its success and effectiveness was presented in form of several case reports however they were not considered substantial for establishing the benefits of meditation on the health.
- Meditation in present times has been able to establish itself as an effective tool for therapies and physiological changes occurring during its practice.
- The commonly used techniques for meditation include transcendental meditation (TM), Hatha yoga, and several practices familiarized by Herbert Benson while undertaking his study on “relaxation response”.

- According to researches meditation helps in reducing the blood flow in the kidneys and liver since there is an increase in the blood flowing to the muscle, skin, and the brain.
- Advanced research established that the increase of the flow was mostly in the brain as that muscle and skin blood flow was not affected by the decrease in liver and the kidneys.
- There are many cases where the meditators have experienced an impact on the adrenocortical activities while meditating. Regular and long-term practice helps in reducing the levels of cortisol and ACTH.
- EEG is also frequently used to quantify the synchrony of the brain. This helps in understanding the clarity and creativity of the thoughts. Long term meditation has helped in significantly increasing the synchrony. EEG helps in understanding the physiological impact of meditation on the brain.
- Balance, flexibility, swiftness, synchronization, and strength are essential for living a healthy life. In yoga balance is required not while holding a posture but more while the movements is changed and adjusted in a posture. It is important to master the transition and develop the strength to prevent injury.
- Yoga forms have different functions, few forms help in relaxing and in some the movement of the body is more.

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13.6 KEY WORDS

- **Transcendental meditation:** This is a form of silent mantra meditation, developed by Maharishi Mahesh Yogi. The meditation practice involves the use of a mantra and is practiced for 20 minutes twice per day while sitting with one's eyes closed.
- **Galvanic skin response:** The galvanic skin response refers to changes in sweat gland activity that are reflective of the intensity of our emotional state.

13.7 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. State some of the benefits of yoga.
2. How does meditation effect the flow of blood?
3. Write a short note on meditation and electroencephalography.

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Long Answer Questions

1. Analyse the physiological changes in the practice of meditation.
2. Discuss the effects of meditation on oxygen metabolism and respiration.
3. Explain the effects of meditation on endocrine, hormones and neurotransmitters.
4. Discuss the different functions of yoga forms.

13.8 FURTHER READINGS

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UNIT 14 BIOCHEMICAL, HEMATOLOGIC, NEUROLOGICAL CHANGES

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Structure

- 14.0 Introduction
- 14.1 Objectives
- 14.2 Yoga and Different Changes in the Body
 - 14.2.1 Biochemical Changes
 - 14.2.2 Hematologic Changes
 - 14.2.3 Neurological Changes
- 14.3 Pranayama and Brain Functions
- 14.4 Answers to Check Your Progress Questions
- 14.5 Summary
- 14.6 Key Words
- 14.7 Self Assessment Questions and Exercises
- 14.8 Further Readings

14.0 INTRODUCTION

For thousands of years, yoga an ancient holistic relaxation practice has been used as an effective therapeutic tool that counteracts the adverse clinical conditions of human beings.

A host of bodily changes have been observed under the influence of yoga. Such practices are really helpful in numerous disorders including hypertension, obesity, anxiety, insomnia and aging itself and a number of other disorders. This unit discusses the biochemical, hematologic and neurological changes in the body. It also discusses the benefits of pranayama and its relationship with brain functioning.

14.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the various biochemical changes observed by practicing yoga
- Differentiate between hematologic and neurological changes
- Analyse the change in functioning of the brain due to pranayama

14.2 YOGA AND DIFFERENT CHANGES IN THE BODY

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Let us analyse the different changes in the body that take place by practicing yoga.

14.2.1 Biochemical Changes

Numerous researchers have time and again proven the benefits of yoga as well as its various forms for helping in managing various physical and mental disorders. It has been prevailing since ancient times as a technique of exercising mind and body for overall wellbeing. It is practiced all over the world in present times and has become tremendously popular because of its significant contributions in the arena of health science. According to latest studies yoga practice has advantageous effects on different parameters of biochemical, physiology, and also psychology in normal and unwell individuals. It has been reported by Madanmohan et al. that practicing yoga helps in preventing and managing diabetic mellitus. It was discovered that there is considerable reduction in the levels of glucose pre and post fasting. The report also observed a significant reduction in the total cholesterol (TC), triglyceride (TG), and very low-density lipoprotein (LDL); there was a considerable rise in the levels of the HDL. In addition to this there was a considerable rise in the ratios of lipid profile. The benefits of yoga were observed in one more group, consisting of diabetic mellitus patients not on insulin there was a noteworthy reduction in the occurrence of hyper-glycaemic index. Chaya et al. established that regular and prolonged practice of yoga is directly linked with enhanced sensitivity to insulin and reduction of a waist size along with the body weight. In a study undertaken by Yadav and Bal on a group of college going females in order to see the impact of various asanas on few hematological variables. The parameters involved in the study were erythrocytes, hematocrit, hemoglobin (Hb), platelets, erythrocyte sedimentation rate (ESR), etc. By the end of the study the participants of the experiment exhibited reduced levels of albumin and increased levels of Hb and ESR. The results of Hb varied significantly among the participants and non-participants whereas not much dissimilarity was found in count of the platelets. There were few kriyas of yoga that seemed to have no impact on any of the hematological parameters or hematological parameters. During the study Bal checked the impact of Kapalbhathi pranayama on hematological parameters, no significant results were reported. In 2015 a study was conducted in order to check the impact of Chandra Nadi Pranayama on hematological parameters. The participants were once again college students aged between twenty one and twenty six. Once again no noteworthy differences were observed in Hb, TC, LDL-cholesterol, HDL-cholesterol and TG.

In the absence of adequate information it is difficult to establish the effectiveness of yoga in treating hematological problems. The extent of its usefulness is still not clear in measuring the biochemical hematological changes.

14.2.2 Hematologic Changes

Individuals of all ages can suffer from a clinical condition called anemia. The condition if detected at the right time can be easily cured but in case it goes unnoticed it can cause death due to heart attack. The obvious symptoms of the ailment is paled colour of the skin, the reduced RBC count leads to a reduction in the thickness of blood, and along with the low levels of Hb there is a lack of transportation of oxygen to the tissues, causing tissue hypoxia. When the body is physically active the heart is not able to provide the tissues with the required amount of oxygen. The problem is cured with the help of medicines and injections. There are few patients who are unable to tolerate hematinics. It would be better in case a synergistic therapy could be provided along with the medicines. This will help in better compliance to the medicine and prevent its occurrence in future. Yoga is considered as a technique which helps in treating physical and mental ailments; therefore a study was conducted in order to check the hematological parameters in subjects suffering from anaemia. The study involved hundred anemic patients, fifty men and fifty females; they were aged between twenty five to forty years.

The participants were made to attend a health clinic where they performed yoga for one hour in the morning. They were going to be monitored for a period of two months before and after the practice of yoga on different hematological aspects like hemoglobin (Hb), RBC counts, count of WBC and platelet counts. After the duration of two months the blood samples of all the participants were taken. The yoga practice included several breathing exercises such as Pranayama, Anuloma viloma, Kapalbhathi, Ujjayi pranayama, Suryabhedhi pranayama, etc. The practice had various yoga asanas, trikonasana, sarvangasana, paschimottanasana, and uttanpadasana. The practice helped the participants to relax deeply and allow the body to reap the benefits of the breathing routine and the asanas. At the end blood samples were taken and there was an increase in the mean value of both Hb and RBC count post yoga practice. The mean value count of WBC had reduced. Although there was no significant change in the platelet count of the participants.

At the end of the short-term study, it was concluded that the asanas and the breathing techniques involved in the practice helped both men and women to relax and as result the internal functions of their body became efficient. The yoga helped in increasing the flow of blood in the body helping the hematologic changes to take place.

14.2.3 Neurological Changes

The introduction of fresh technology in neuroscience, involving the functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) has helped in understanding the activities of the brain. The activities can be observed during different states like meditation, sleep or general rested state. The connection of neuroscience with mindfulness, meditation, and yoga has become very deep and as a result it is easy to understand the changes that take place in the brain during

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the different states of human body. Meditation, chanting and even breathing patterns have an impact on the activities of the brain. The impact of yoga on activities of the brain has further established the relevance of practicing yoga in present times. The fact that people can see the result of a particular yogic practice on the activities of the brain has enhanced its importance. This has helped in cultivating the practice of pratipaksha bhavana. It is actually interesting to be able to know how yoga affects the different parts of the brain. For instance when individuals have positive thoughts in the mind the brain's prefrontal cortex towards the left side is lighted up. The imaging helps in seeing the impact of stress on the mind as well. The events in the brain cascade through the body in barely milliseconds. During this time the amygdala, hippocampus, the adrenal glands and many other parts are activated in an attempt to respond to the threat to the body. When the brain is stressed and the body reacts to the threat then the frontal cortex turns slightly offline. It does not completely shut down but only slightly offline but the amygdala, the hippocampus, the other stress responses remain extra responsive in the brain. The state of the brain of a meditation practitioner is not same as this as people with prolonged experience of meditation are able to refurbish their brains and they know how to control negative responses to anxiety such as anger, violence, extraction or despair. This capacity is common amongst the meditators.

It has been exhibited in various reports of such studies that regular and prolonged practice of yoga and meditation helps in structures of the brain to alter their form. For instance the amygdala is known to shrink as a result of regular practice of yoga and meditation. The shrinking causes the amygdala to have reduced neuronal pathways. The study was initiated only after the fMRIs of brain of individuals were taken. The amygdala is positioned at the centre of the brain and has specific proportions. By the end of the study the regular meditators had an amygdala of a much smaller size. The practice of yoga and meditation reduces the size as a result the level of activity considerably reduces in the amygdala and it does not get stimulated generally. Since the response of threat stops individual learn to manage their threat response better and there is not much neuronal activity taking place in these parts as a result they start to be reformed and their stimulation also reduces.

Even while witnessing people meditating, the mirror neurons of individuals get activated as if they are involved in the act. The environment also activates certain vibrations and this makes the mirror neurons to get active. For example when people attend a chanting or a meditation session the mirror neurons begin to respond to the happenings of the environment. The mind of all those present gets activated in a positive manner. This occurrence has been spoken in the teachings of Buddha, according to him people can take refuge in three places, namely with their teacher or in their wisdom and lastly in the sangha. He felt that these three helped in uplifting and rewiring the emotional balance of individuals. Such things have a positive impact on the minds of the people.

Neuroscience is authenticating the practices of yoga that have been prevailing from centuries. All practitioners and teachers of yoga need to realise the neuroscience behind yoga so that they are able to appreciate the influence of practicing yoga on people's neurobiology, individuals will be able to shift their psychological and emotional statuses and begin to function with the brain. Every individual is capable of purposefully altering the functions and the structural form of the brain. They can begin by visualising the shrinking of amygdala and the left prefrontal cortex being activated and generating positive thoughts. The brain can be activated with the concept of reward circuitry. Yoga helps in teaching the individuals ways of activating the brain's consciousness intentionally. This work with sankalpa will help in achieving overall emotional health.

There are several researches that prove that regular and prolonged practice of yoga and meditation helps in a strong impact on not only the human mind but also on the nervous system and the brain. There are several areas that need to be researched in this field. All the researches that have been conducted had similar results and in all of them it was established that practice of Yoga and its forms such as mindfulness and meditation affect the nervous system, mind, and brain strongly. This is a vast field and requires much more research; along with yoga practice of CBT is also known to have a positive impact on the human brain and their neurobiology. The CBT and practice of pratipaksha bhavana are very similar. The researches have also established that yoga and neuroscience are closely linked with each other.

There are studies that have found that yoga helps in treating neurological ailments like epilepsy. Although, it is essential to identify that behavioural adjustment and improved lifestyle could also have been the reason for improvement in the condition of the patient. A study by Bastille et al. validated the advantages of yoga amongst patients who has suffered from a stroke. Although in some cases the Berg Balance Scale (BBS) did not show much change, but there was improvement in few of the subjects. The study helped in illuminating the influence of yoga on suppleness, muscular strength, stamina, and motor function in persons suffering from chronic hemiparesis after the stroke. In order to realise the actual benefits of yoga in exercise based programs it is essential to involve more number of participants. In another study conducted by Oken, it was realised that yoga and aerobic exercise helped in releasing exhaustion for Multiple sclerosis patients.

It is essential to realise that the benefits of yoga can only be determined with its regular and correct practice. It should be done under the guidance of an experienced yoga coach. Benefits of yoga can be felt only after increasing the frequency as the metabolic equivalent of yoga is not high.

In present times yoga is extensively used for promoting overall wellbeing, preventing physiological diseases and as far as possible in treating neurological ailments. Yoga is often used as an additional cure for disorders such as carpal tunnel syndrome, multiple sclerosis, epilepsy, post-stroke paresis, and neuropathy

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of type two diabetes. Researches are being conducted in order to see its effectiveness in treating disorders such as fibromyalgia, headache, migraine, etc.

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14.3 PRANAYAMA AND BRAIN FUNCTIONS

Pranayama is a breathing exercise; its practice can be dated back to many centuries. The practice originated in India but today it is followed all over the world. It helps in benefiting the functions as well as structure of tissues in the body, its benefits can be specifically felt on cardio-respiratory system. While pranayama has a temporary impact on the respiratory system, its improved effect on the nervous system, circulatory system, endocrine system can be felt for long. The practice helps in maintaining homeostasis of all the inner parts of the body and their functioning. It helps in providing a balance in the body's sympathetic and parasympathetic physiology. In olden times there was no way of finding the benefits of pranayama on the inner parts of the body, yet it was practiced and promoted. There are several levels and sequences of the exercises in pranayama.

The changing lifestyle of individuals all over the world has aroused the need for balancing and integrating the structure and functions of the body parts. The extensive activities of the daily routine sometimes become a cause of increasing the levels of stress and even cause depression among some. Several intensive researches have been undertaken in different parts of the world to establish the benefits of practicing pranayama on structure and functions of the organs. Financial and physical support for the research has been provided by the National Institute of Health (NIH) in form of National Centre for Complimentary and Integrative Health.

In the past many researches have established that practicing pranayama is helpful in not just maintaining good health, it also helps in treating people suffering from cancer, disturbed sleep, hypertension, nervousness, and several cardiovascular ailments. Pranayama is a process of controlling the breathing pattern. Oxygen is the body's most essential molecule. The tissues are able to function efficiently only when they have adequate supply of oxygen. Pranayama helps in delivering oxygen to the tissues and improves the structure and helps in altering the functions of the nervous system especially in the functioning of medulla oblongata.

Various kinds of breathing patterns are involved in the practice of Pranayama; these patterns help in enhancing the varied inspiratory and expiratory groups of muscles, systems of the body and centres of the brain. The regular pattern of breathing progresses in the medulla as human's age, but the pattern needs to be modified as per the level of physical activity, environment, food habits, structure of the body and many other such factors. The centres of breathing alter this pattern after they receive input through the sympathetic and parasympathetic response. The strength of diaphragmatic and intercostal muscles improves by the practice of pranayama as it involves deep breathing. The muscles are able to provide better

ventilation and the consumption of energy also reduces. In the long-run the practice helps in reducing the rate of respiration and there is an increase in the tidal volume along with a reduction in the residual volume. An increase in residual volume is one of the major factors contributing to tiredness while indulging in physical activity. Pranayama may be practiced on a daily basis and the best time to practice would be early morning before breakfast. It is advised to perform the pranayama after taking a bath with cold water as this helps in controlling the sympathetic response. Since the aim of pranayama is to improve the parasympathetic response. It should be done in fresh air under the sun for best results. The benefits of practicing pranayama is felt by beginners as well, since the body feels energetic and relaxed after its practice. The hectic lifestyle of people hinders the tissues and organs to function efficiently. Pranayama helps in providing adequate oxygen to the tissues, systems, muscles and other structures so that they can perform to their optimum level of efficiency. Presently due to inadequate research in the field it is not sure to what extent the practice helps in changing the structure and functions of the nervous system. The researchers of this field need to work closely with specialists of neurology, anatomy and neurophysiologists so that they are able to understand the varied aspects of pranayama and the extent of its impact on the internal organs of the body. There is a need for complete investigation in order to confirm the benefits of the practice in treating specific ailments.

Generally, the advantages of pranayama can be seen by the physiological modifications in the functions of the lungs. The practice helps in improving the tidal volume, inspiratory reserve volume, vital capacity, overall functioning of the lungs and reduction in residual volume (air remaining in the lungs post exhalation). These changes take place as a result of improved efficiency of diaphragm, intercostal muscles, abdominals, and various auxiliary muscles connected with inspiration and expiration. Every exercise of the pranayama focuses on diverse functions and structures of the body therefore practicing it for a period of half an hour would lead to revitalisation of all body parts. The practice can be done by people of all ages. It helps in refreshing the mind and harmonising the inner parts of the body and its systems. The practice also helps in body's homeostasis.

Thoughts and actions affect the brain in a dynamic manner. Positive thoughts and actions will help in providing a stress free life and mental health will be enhanced. Yoga helps in filling the mind with positive energy. Positive thinking improves the functioning of the brain.

There is a simple equation to understand the working of the mind—a mind full of stress will give stress to the muscles and stressed muscles will give rise to negative thinking. In the same way, a peaceful mind will help in relaxing the muscles and will automatically result in positive and inspiring thoughts.

Human actions are always a result of their thoughts. The power to alter actions lies solely with the human beings. People themselves have the power and

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skills to change the working of the brain. Positive thoughts will help in destressing the mind and benefit the overall wellbeing.

The thoughts and actions of people alter the brain's chemical composition. The brain can be easily rewired with the help of pranayama as the exercises help in practicing deep and slow breathing, this helps in relaxing the muscles and improves the thought process of the brain.

According to the statement of Alex Korb in "Psychology Today" (he has a PhD in neuroscience at UCLA and he has closely studied the impact of yoga on stress and functioning of the brain), *"the specific thoughts you have may differ, but the brain regions involved and the physiological response will be the same. The physiological stress response means an increase in heart rate, breathing rate, muscle tension, and elevation of cortisol and other stress hormones."*

It is natural as to how people react when they are stressed; the brain reacts to emotions of stress in the manner it has been tuned over the period of time. This is referred to the 'response factor'. Yoga and pranayama can help in altering this factor. The responses of the brain can turn into positive actions with yoga as the deep breathing and relaxing of the muscles helps in bring clarity of thoughts and reduces stress of the daily life. The negative thoughts are eliminated from the mind. Pranayama helps in decreasing stress, depression, anxiousness and at the same time it helps in improving overall health.

The human brain is an intricate, enigmatic, soft, and springy mass made up of nerve cells and supporting tissues. It weighs roughly about one and a half kilograms. The functions of the brain have remained a mystery throughout and several attempts have been made by the neurologist to understand the system of nerves in the brain. There have been many researches to understand the connection between pranayama and brain. As a result the following things have become clear:

- Pranayama helps in increasing the supply of oxygen this improves the flow of blood to the brain
- Yoga encourages development of brain neurons and their networks.
- Yoga inspires the mind to be calm and peaceful.
- Yoga helps in improving the functioning of other parts of the body thus improving the brain function.

Check Your Progress

1. How is yoga used extensively in the present times?
2. State some benefits of pranayama.
3. What has helped in understanding the activities of the brain?

14.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. In present times yoga is used extensively for promoting overall wellbeing, preventing physiological diseases and as far as possible in treating neurological ailments.
2. Pranayama helps in decreasing stress, depression, anxiousness and at the same time it helps in improving overall health.
3. The introduction of fresh technology in neuroscience, involving the functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) has helped in understanding the activities of the brain.

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14.5 SUMMARY

- Numerous researchers have time and again proven the benefits of yoga as well as its various forms for helping in managing various physical and mental disorders. It has been prevailing since ancient times as a technique of exercising mind and body for overall wellbeing.
- It is practiced all over the world in present times and has become tremendously popular because of its significant contributions in the arena of health science.
- Individuals of all ages can suffer from a clinical condition called anemia. The condition if detected at the right time can be easily cured but in case it goes unnoticed it can cause death due to heart attack.
- The introduction of fresh technology in neuroscience, involving the functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) has helped in understanding the activities of the brain.
- It has been exhibited in various reports of such studies that regular and prolonged practice of yoga and meditation helps in structures of the brain to alter their form. For instance the amygdala is known to shrink as a result of regular practice of yoga and meditation.
- Neuroscience is authenticating the practices of yoga that have been prevailing from centuries. All practitioners and teachers of yoga need to realise the neuroscience behind yoga so that they are able to appreciate the influence of practicing yoga on people's neurobiology, individuals will be able to shift their psychological and emotional statuses and begin to function with the brain.
- There are studies that have found that yoga helps in treating neurological ailments like epilepsy. Although, it is essential to identify that behavioural

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adjustment and improved lifestyle could also have been the reason for improvement in the condition of the patient.

- Pranayama is a breathing exercise; its practice can be dated back to many centuries. The practice originated in India but today it is followed all over the world. It helps in benefiting the functions as well as structure of tissues in the body, its benefits can be specifically felt on cardio-respiratory system.
- The changing lifestyle of individuals all over the world has aroused the need for balancing and integrating the structure and functions of the body parts. The extensive activities of the daily routine sometimes become a cause of increasing the levels of stress and even cause depression among some.
- Various kinds of breathing patterns are involved in the practice of Pranayama; these patterns help in enhancing the varied inspiratory and expiratory groups of muscles, systems of the body and centres of the brain.
- Thoughts and actions affect the brain in a dynamic manner. Positive thoughts and actions will help in providing a stress free life and mental health will be enhanced. Yoga helps in filling the mind with positive energy. Positive thinking improves the functioning of the brain.
- The human brain is an intricate, enigmatic, soft, and springy mass made up of nerve cells and supporting tissues. It weighs roughly about one and a half kilograms.

14.6 KEY WORDS

- **Pranayama:** It is the formal practice of controlling the breath, which is the source of our prana, or vital life force.
- **Hematology:** It is the branch of medicine concerned with the study of the cause, prognosis, treatment and prevention of diseases related to blood.
- **Erythrocyte:** It is a red blood cell, which (in humans) is typically a biconcave disc without a nucleus.

14.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on anemia and its symptoms.
2. How does yoga affect different parts of the brain?
3. How does yoga help in preventing and managing diabetic mellitus?

Long Answer Questions

1. Analyse the biochemical changes observed through yoga.
2. 'Yoga and pranayama can help reduce stress.' Explain.
3. How are the functions of brain related to pranayama? Discuss.

*Biochemical, Hematologic,
Neurological Changes*

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14.8 FURTHER READINGS

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