



INDRIYA VIGYAN

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ABSTRACT

Apparatus through which living body symptoms are expressed are called 'Indriya' Many sensory and motor functions are performed by Indriyas. Types of Indriyas are Pancha Buddhindriya, Pancha Karmendriya and one Ubhayendriya Mana.

Review of Literature

Pancha Buddhendriyas (Apparatus of sensory neurons): Shrotra (Auditory), Sparsha (Somatic sensory system), Chakshu (Optic), Rasana (Gustatory) and Ghrana (Olfactory). Pancha

Pancha Buddhendriya Adhishthana (organs): 1. Akhina (Eyes), 2. Karno (Ears), 3. Nasike (Nostrils), 4. Jivha (Tongue) Located in Head, 5. Twak (Skin)

Karmendriyas (Somatic Motor system receptors): Vaag (Tongue), Hasta (upper limbs) Upastha (penis), Paayu (External rectum) and Paada (lower limbs). Mana (Mind) is a dual apparatus.

Karmendriya Adhishthana (organs): Vaag (Tongue), Hasta (upper limbs), Upastha (penis), Paayu (rectum) and Paada (lower limbs).

Mana (Mind): Awareness of self communication, memory and understanding.

Buddhendriya Artha (Sensory stimulus or object of sense): Shabda (sound), Sparsha (touch), Rupa (reflection of light), Rasa (taste), Gandha (smell).

Karmendriya Artha (Motor objectives): Vachana (Speech), Aadaan (Flexion & extension etc.), Aananda (Orgasm), Visarga (defecation), Viharana (motion).

Indriya dravya (Molecular content): Aakaash, Vaayu, Tej, Aap, Pruthvi (Electrical, Neurotransmitters, neurotrophins and chemicals like calbindin, norbin, extra cellular matrix.)

Indriya Buddhi (Perception): Shrotra, Sparshaj, Chaakshush, Rasaj and Ghranaj are five Indriya buddhies.

Indriya Adhishthana vikruties: Karna khwed, Vrana, Vartma roga, Jivha Paak, Nasaarsha, Vatarakta at Hasta- Pada, Upadansha at Upastha, Bhagandar at Guda or Abhighat at any of the Adhishthana.

Indriya Vikruties: Badhirya, Suptata, Timira, Vichitra or Arasagyata, Agandhata or Vichitra gandhata, Muk- minmin-gadgad, Ardita, Pakshaghat, Vrushnotkhepa or stambha, Guda bhraunsha, Vin-Mutra nigraha abhava etc.

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INTRODUCTION

Introduction to word 'Indriya'

Apparatus through which living body symptoms are expressed are called 'Indriya'. Indriya is sign of Indra.^[1] Meaning of word 'Indra' is life ('Prana'). 'Indriya' denotes vitality (Aatma lakshana), like stimulus to sensory material of body, sign of life (Indradrishtam), evolved in life (indrasrishtam) with senses (indriyajushtam) given by sensory inputs (indriyaduttam) etc.^[2] When it comes to an end, symptoms expressed are towards the end of life, 'Arishta,' maransuchaka.

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Indriyam Indralingam – Panini 5.2.93; Cha. Indriyasthana 1.1 Indrasya aatmanolingam. Indradrushtam, Indrasrushtam, Indrajushtam, Indriyaduttam- Amarkosh

Meaning of Indriya (senses)

- Power of senses,
- Faculty of sense- special senses,
- Sense – general senses,
- Apparatus or Organ of sense

Indriya swaroopa (Constitution)

Basic matter includes panchamahabhuta, mind, time, soul and direction (disha). If organic body bears Indriya, it is Sendriya (living body). Without Indriya it is non-living matter^[3] Indriyas are constitutionally Panchabhautik- Cha. Su.1.48.

Indriya samkhya (Count)

There are many views in this regard.

- Ekadash -Eleven in nos. (traditionally Majorly known)
- Panchendriya-Five in nos. (Aupacharik (Just to know few))
- Anek samkhya indriyawat - multiple in nos.(like various spersha , rasa.)

Commentator states that even if two eyes, ears and nasal cavities are mentioned, it is one unit for each. One eye is representative of two and hence even if total number goes to eight, it should be taken as five. ^[4] Cha. Chi 1/2) Chakrapani

Names of Indriya

The names of 'Panchbuddhinriya' and 'Panchakarmendriya' is given by Shushrutacharya.5 and Vagbhatacharya.Cha.su. 8.8; Su. Sha. 1.6

Panchbuddhinriya

- Shrotra (Auditory),
- Sparsha (sensory),
- Chakshu (Optic),
- Rasana (Gustatory),
- Ghrana (Olfactory),

Panchakarmendriya

- Vaag (Tongue),
- Hasta (upper limbs),
- Upastha (penis),
- Paayu (External rectum) and
- Paada (lower limbs) are five motor organs.

Ubhayendriya

- Mana (Mind) is a dual apparatus.

Indriya Artha (Sensory stimulus or object of sense)

There are five stimuli or objects of Indriya. Ch. Su. 8.11; Su. Sha. 1.5

- Shrotra - Shabda(sound)
- Twak - Sparsha (touch)
- Chakshu - Rupa (reflection of light)
- Rasana - Rasa (taste)
- Ghrana -Gandha (smell)-

Karmendriya Arthah (Motor objectives)

- Vaag - Vachana (Speech)
- Hasta - Aadaan (Flexion & extension etc.)
- Upastha - Aananda (Orgasm)
- Paayu - Visarga (defecation)
- Paada - Viharana (motion)

Indriya sthana (Organs of senses)-Indriya Adhishthana-predominant structures

Pancha indriya Adhishthana are five material faculties or powered Mechanical Apparatus namely; Structures of two eyes, two ears, two nasal cavities, and one tongue and skin with organ receptors /extroceptors -(Receiver organs or outward wits)7 – Cha. Su. 9

- 1. Akshini (Eyes)
 - 2. Karno (Ears)
 - 3. Nasike (Nostrils)
 - 4. Jivha (Tongue)
 - 5. Twak – (Skin) - Sarvashrayah- all over the body.
- } Located in Head

Structures for Artha grahana

All indriyas are like higher organs which are said to be cranial (Shirah)- Shirasi Indriyani - Locations of senses specialized cells in brain (introceptors- cognitive receptors)- sukshma and karmaumeya but bhautik.

There are Shabdaadi chaturah- Urdhwaga dhamanyah – Cranial nerves-Auditory, Optic, Glossopharngial, and Olfactory.

Motor organs

- Vaag (Tongue),
- Hasta (upper limbs),
- Upastha (penis),
- Paayu (rectum) and
- Paada (lower limbs) are five motor organs.

Motor & Sensory control

Motor areas sensory areas association areas concerned with sensory input of the opposite side of the body. Two hemispheres are not equal in function. No functional area acts alone.

Indriya dravya (Molecular content)

These are the conductors or biosensor of predominant structures in specialized organs and brain (adhishthan)- Cha. Su. 8.9

- Aakaash neurotrophins. } Electrical, Neurotransmitters,
- Vaayu
- Tej
- Aap
- Pruthvi } Chemicals like calbindin, norbin, extra cellular matrix.

Indriya Buddhi (Perception)

Shrotraj, Sparshaj, Chaakshush, Rasaj and Ghranaj are five Indriya buddhies. Satwa- Aatma sannikarsha- Shubha-ahubha pravrutti hetu .It is linked with internal entity. 8 Cha. Su.8.12

Indriya buddhi guna -Analytical (Vyanjaka) properties

- **Aakaashiyam** – These are satwa bahul –kha- chhidra visheshah -Shravan vivara sagyakam - vibrations, resonance- shabda, ghosha- shrotraadhithaan – yatha ghataadau.
- **Vaayaviyam**- These are rajobahul- twag-sparshah- Spershoplambhan-conductivity- spershnendriyadhishthanam- tatha ucchwasah.
- **Taijasam**- These are satwarajo bahul- druk-drushti- Rupavyanjakatwam- light spectrum (Visible)- chaksurendriyadhishthanam- tatha tej, varna, vhani.
- **Aapyam**- These are satwatamobahl-jivha vishishta ekadesho- Rasoplambhakam- juicy, essence- rasanendriyam- tatha shad rasa.
- **Parthivam** – These are tamobahul- nasa vishista ekadesho- gandha vyanjakatwm- pungent-

ghranendriyam- yatha bhu gandha. Va.9 Sha.3/3, Arundatta tika.

Interpretation of objects sense organs

Five types of Buddhi spell out understanding or interpretation of perception. This perception of object or interpretation of object needs union between object and perceiving apparatus. Then it is conveyed through special senses to soul by means of mind with intellect. Buddhi pratyaksha (Actual perceptible knowledge).10 Ch. Su. 9.15

When soul, sense organs mind and object come together, precipitation of perception takes place. Knowledge acquired in such fashion or interpretation of such kind is called 'Actual perceptible knowledge', 11 Eye witnessed knowledge. Ch. Su. 11.20

Mana (Mind) Aatmanamadhikrutya dravya

Mind is close to Indriya and soul. It does psychological co-ordination of objects good or bad accepted by Indriya in its capacity (Samanaska saamarthya yogaat samayoga). Mind is awareness of self communication memory understanding.12 Cha. Sha. 1.22,23.

Mana is also called as Ateendriya which means it can do cognizance of senses; beyond the senses i.e. Aatmaa.

Perception of mind

Perception of mind depends on its status. If mind is in high quality mood, object appears different than when mind is in active status. Hence mind shows colors of its own status in perception of object. Same mind appears different in different times due to its status.13 Ch. Su. 8.50

Importance of convener

Sense organs are able to function properly when mind is present as a conveyer, convener 14 Ch. Su. 7

Mind status & Artha graham

Commentator of Charaka-Samhita further explains this. He says mind is so quick; it is not necessary that it remain in same status. In a moment it may change its status. One minute mind may be thinking about religion and next minute it may be thinking about sex. When it is thinking about religion it is in 'religious' mood. Chakrapaanidutta.15

When it is thinking about sex, it is in 'sex enjoyable' mood. Both are two sides of same mind. In mood of enjoying sex, mind is unable to think about religion. So it remains in same mood at one time.

Example. This can be explained with an example.

- A rose flower is red in color.
- A mind with anger will feel its color is like red fire.
- A mind with cool feeling will feel its color is beautiful like sunrise.
- An ambitious mind will feel its color is like rising morning sun.
- A killer may feel its color is like blood.
- And in same person may not understand its color at all.

These are shades of same object seen with different moods of mind. This is indicated in this. It explains that mind at a time

does not indulge in many moods however perception is different every time depending upon the status of mind.

Karya (Functions) of Indriya

- Soul and mind unite;
- Mind unites with Indriya.
- Indriya unites with object and one can perceive the external entity. Tarka Samgraha.

Functions of sensory apparatus

- Reflection from an object is identified by both the eyes-Vision
- Grasping sound waves - Hearing
- Identified inhaling air/ dravya - Smell
- Identified chewed dravya- Taste
- Identified various stimulations - Touch, pain, temp., pressure. Chakrapaani teeka. 16

It is mechanism of perception of objects by special senses. However, logic science also existed for practice, which was aware of different laws meant for perception special senses.

Laws meant for perception

Conduction of sound waves, which is part of physics, is explained on above verse. Like waves on lake, which are concentric in nature, sound waves make contact with hearing system. Vichitaranga and Kadambamukula nyaya.-17 Tarka Samgraha Dipika-43

Importance of Indriya

Even if soul is present in body it is unable to perceive any stimuli from outside. Organs of senses are needed to be present in body to perceive external and internal environmental signals. Without them, soul is helpless to reciprocate. Soul gets all information through Indriya.

Generation of Indriya

In unicellular zygote everything is present. Yet for special senses and for other sense organs to develop and differentiate it takes third month.18 Cha. Sha. 4.11

Nourishment in intra-uterine life

Through the srotas of Kapha and Rakta; from the excel part of Panchabhautic dravyas (Mahabhoot parinam visheshh samudayamelakah); Indriyas are developed.19 Ash. Sam. Sha. 5

Indriya poshana (Nourishment)

Food has smell, taste etc. When food of choice is eaten, mind is in good mood. By continuous usage matter in sense organs undergo catabolism and reduction. With good food by way of look, smell, taste and touch replenish, nourish and refreshes Indriya.20 Cha. Chi. 15.

Ways of perception

Mechanism of perception is described in this verse. For final perception what is needed is 'Indriyabuddhi'. Object and bodily perception is sometimes like samavaya (conjugation), sometimes samyoga (togetherness); however soul intimating center of perception has to merge with mind, mind has to merge with sense organ and sense organ has to merge with object.21 Cha. Su. 8. 12- Chakrapaani

Indriya Vigyan

It is of six types like plane samyoga (scontact), samyukta samavaya (contact in combination), samyukta samaveta samavaya (multiple combinations)-permutations and combinations of same or different senses

Sensory Areas

Found in the parietal, temporal, & occipital lobes with Conscious awareness of sensation.

- Spatial discrimination:** Parietal lobe- skeletal muscles and skin and identifies region being stimulated.
- Somatosensory association:** Parietal lobe- object being felt to produce an understanding.
- Visuals Areas:** Occipital Lobe- Information from the eyes. Information from the right eye is mapped in the left visual cortex and vice versa. Also interprets visual stimuli using past visual experience
- Auditory Areas:** Temporal Lobe- Information on pitch, rhythm, and loudness in interpreted and perceived as sound. Memories of sound are stored for reference.
- Olfactory Cortex:** Frontal Lobe & Temporal- olfactory signals and perceives smells.
- Gustatory Cortex:** Parietal Lobe- Taste
- Vestibular Cortex:** Insula & Temporal Lobe" Equilibrium" Position of the head in space.

Association Areas

Communicates between the primary sensory areas and the motor areas and other areas to:

Analyze, recognize, act on input in reference to past experience.

All of the sensory areas are connected to specific association areas

Prefrontal Cortex: Anterior Frontal Lobes-

Intellect, complex learning, recall and personality, abstract ideas, reasoning, concern for others

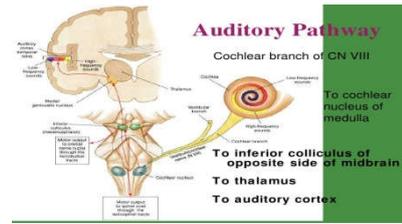
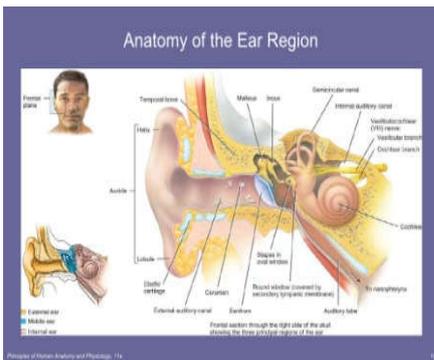
Language Areas: Temporal Lobe-

Language dominant side:
Non-language dominant side:

General Interpretation Area: Found in one hemisphere only-integrates all signals into a single thought or understanding.

Visceral Association Area: Insula- Conscious perception of sensations from the internal organs. (ie. full bladder)

Shrotrendriya Adhishthana- Structure of ear- Mechanical apparatus of hearing..|- It is for the function of hearing and Shrotrendriya or shrotrabudendriya 22 Cha. Sha.1.79

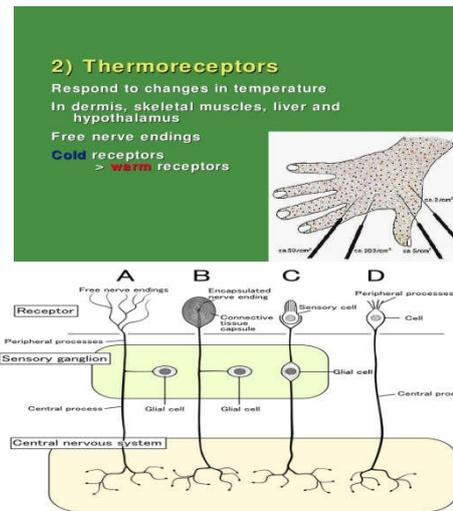


Spershanendriya (Skin)

Adhishthana

It is present all over the body, even in all special senses. 23 Cha. Sha. 1.79

Structural part of skin where sensory receptors are located is Spershendriyadhishthan.

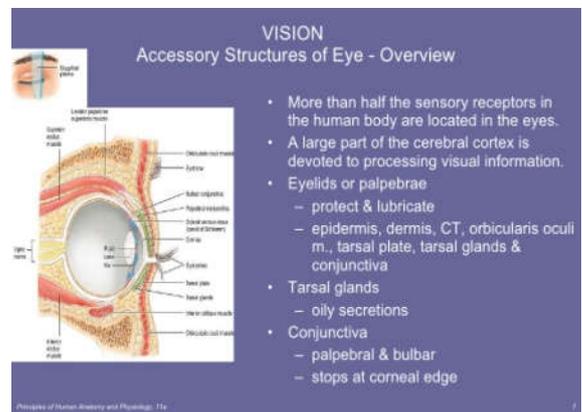


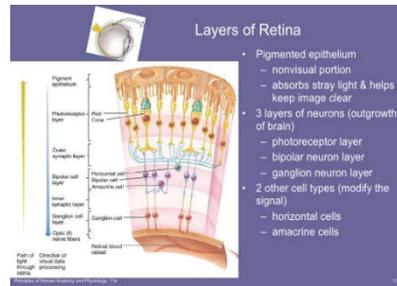
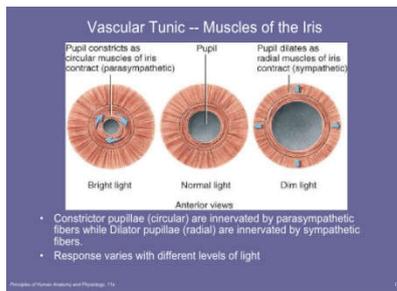
Sessions are different in various parts of the body as per the stimulus. These are not same and not at the same time though the skin (spershendriya adhishthana) is everywhere. Their perception is done through buddhindriya. Cha. Sha. 1.79 - Chakrapaani

Speshndriya- Areas in cortex.

Chakshu (Eyes)Adhishthana

Eye balls are the Mechanical Apparatus up to Rods and Cones (Chakshurendriya Adhishthan).

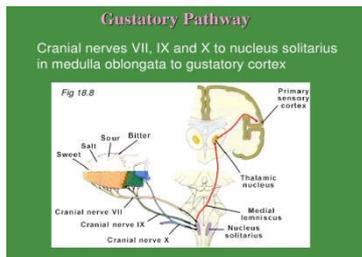
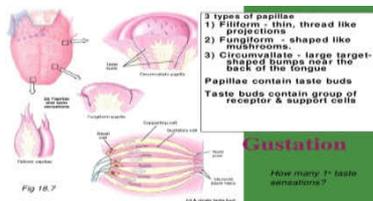
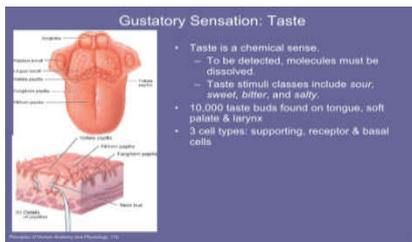




Chakshuradinindriya are located in head. Their lubrication is done by 'Tarpak kapha'.

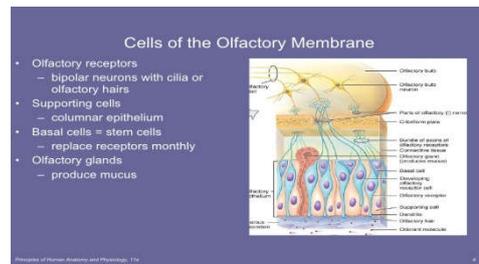
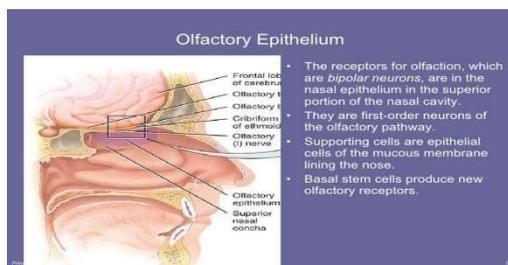
Chakurendriya-Optic chiasma and visual cortex

Tongue is a Rasenendriya Adhishthan



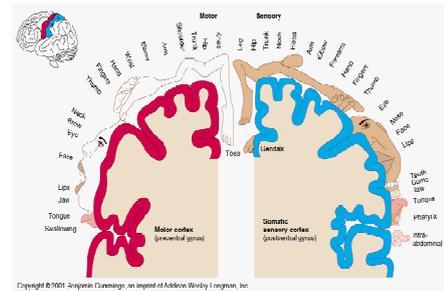
Chemical receptor of Tongue for taste and perception area of cerebral cortex is Rasenendriya.

Ghranendriyadhishthan (Nose)



From Chemical receptors to the area of smell in cerebral cortex is Ghranendriya.24 Cha. Sha. 7.16; Cha. Su. 8.8; Cha. Sha. 7.7

Karmendriya Centers in Brain



Indriya - Pancha - Panchaka

There are five sense organs, five mahabhuta, five mechanical apparatuses for perception of sense; five objects, five interpreting centers are present in each individual. These five elements of five sense organs cater knowledge about their physiology and hence are named as 'Indriya (senses) Pancha (five of them) Panchaka (of five elements)'. This is for the recitation of the science. Cha. Su. 8.3

Indriyadhishthan (five sense organs)

Eye, ear, nose, tongue, and skin are five sense organs. Even if ears, nasal cavities, eyes are two openings, they are taken as one unit. Chakrapaani teeka.

Indriya- (Senses)

Their panchbhautikatwa can only be judged by their panchbhautic nature. Cha. Su. 8,14

Constitution of sense organs is panchabhautic. Every sense organ has one mahabhuta predominant in spite of such constitution. Teja is predominant in eye, Akasha is predominant in ear, Pruthvi is predominant in nose, Apa is predominant in taste organs and Vāyu is predominant in touch perception. All these things are so natural and by wish of God.

Adhishthana is support. Whatever apparatus is working to gather information; to send to Indriya dravya for interpretation of object, is called 'adhishthana'. It is mechanical instrument through which object gets perceived (Buddhi).

Sannikrushta and Viprakushta Indriya

'Sameepvarti vishaya grahansheelm, Ghranam Rasanam Twagiti cha sannikrushta vruttini.' 26

Ka. Sha.

Olfactory, Gustatory and general senses are able to percept their perceptible knowledge only when the objects come into contact of their neurons. Whereas Mana and Chakshu are able to percept their perceptible knowledge from distance.

‘Doorgrhansheelani Mana Chaksuradini. 27 Ka. Sha.

It is needed to add in context to Buddhi that Bhela-Samhita has referred to two types of Pitta in living body; Chakshuvaisheshika and Buddhivaisheshika. This in fact is connected with Indriya Buddhi, which analyses minute seen and unseen objects.

Indriya – Pancha – Panchaka

Indriya Artha /Vishaya or object	Adhishthanam or specialize structure	buddhendriya or sense organ	Indriya dravyam -Mahabhuta or biosensor	Buddhi or perception
Shabda-Sound	Karna –Ear upto cochlea	Shrotram- Auditory, temporal lobe	Akasha- Electrical ,	Shravaṇam- hearing
Sparsha-Pain, touch, temp., pressure.	Twak-Skin	Sparshana- General sense	Vayu Neurotransmitters, neurotrophins	Sparshanam- Touch
Rupa-Image	Akshi-Eye balls up to rods and cones	Chakshu –Optic chaisma to visual cortex / Optic lobe	Teja- Photochemicals like rhodopsin,iodopsin, BPA	Chakshusham- Vision
Rasa-Taste	Jivha-Tongue-taste buds	Rasanam – Gustatory, Hippocampus	Chemicals like CA1, calbindin, norbin,	Rasanam- Taste
Ghraṇa -Odor	Nasa-Nose up to olfactory buds	Ghraṇa-Olfactory, Hippocampus	Pruthvi – Chemicals like APP,BACF1 &CHLI	Ghraṇam

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