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UUA Assignment

Anatomy

Submitted to

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Q No: 1

ANS:

Structure of Human Ear:-

→ The Structure of Human ear is consist of three main parts.

(1) External Ear

(2) middle Ear

(3) Internal Ear

→ The Ear is the organ of hearing and in mammals, balance.

External Ear:-

The external Ear of the human consist of the

Following Anatomical Structure.

(A) Auricle

- Helix
- Tragus
- Lobule
- Concha
- Auricular muscle.

(B) External Auditory.

- Hairs
- Sebaceous Gland
- Ceruminous Gland
- Lesser occipital
- Greater auricular nerves
- auriculotemporal nerve
- Auricular branch of Vagus nerve

(C) Tympanic membrane

(A) Auricle (Pinna)

→ The Auricle has a characteristic shape

→ to collect air vibration

→ It consists of thin plate elastic cartilage covered by skin

→ Main Components:-

(i) Helix:-

It is the main component of the ear.

→ Elevated margin of auricle

(ii) Tragus:-

It is a projection from anterior margin of auricle.

→ It extend over the opening
of external acoustic
meatus-

(iii) Cobule:- (Ear lobe)

→ The Cobule does not
contain cartilage

(iv) Concha:-

The concha
is the deepest depression
within the auricle

→ which leads into external
meatus

(v) Auricular muscle:-

→ The Auricular muscle
are essentially vestigial
in humans

→ But are variably
entertaining to those
able to wiggle their ears-

(B) External Auditory Meatus:-

→ it is a slender curved tube that leads from the concha of auricle to tympanic membrane.

→ it conducts sound waves from auricle to tympanic membrane.

→ Outer third of meatus:-

↳ The outer third of meatus is elastic cartilage.

→ Inner two third of meatus:-

↳ It is a bony canal formed by tympanic plate of temporal bone.

(i) Hair:-

The hair is located at outer third meatus
→ Prevent foreign bodies-

(ii) Subcutaneous and Circumminous Glands

→ They are modified sweat gland

→ They secrete a yellowish brown wax-

→ Which provides sticky barrier

→ And also prevent the entrance of foreign bodies-

(iii) Lesser occipital and Greater auricle Nerve

→ Main Sensory nerves
of the auricle

→ Branches of cervical
plexus-

(iv) Auriculo temporal
Nerve and

Auricular branches of

Vagus Nerve

→ Primary sensory nerve

→ External meatus and
external surface of
tympanic membrane

(c) Tympanic membrane:-

→ It is a thin, fibrous
structure.

→ It form the interface between the external ear and middle ear -

→ The membrane is

→ obliquely oriented

→ facing freely

→ anteriorly and laterally.

(2) Middle Ear:-

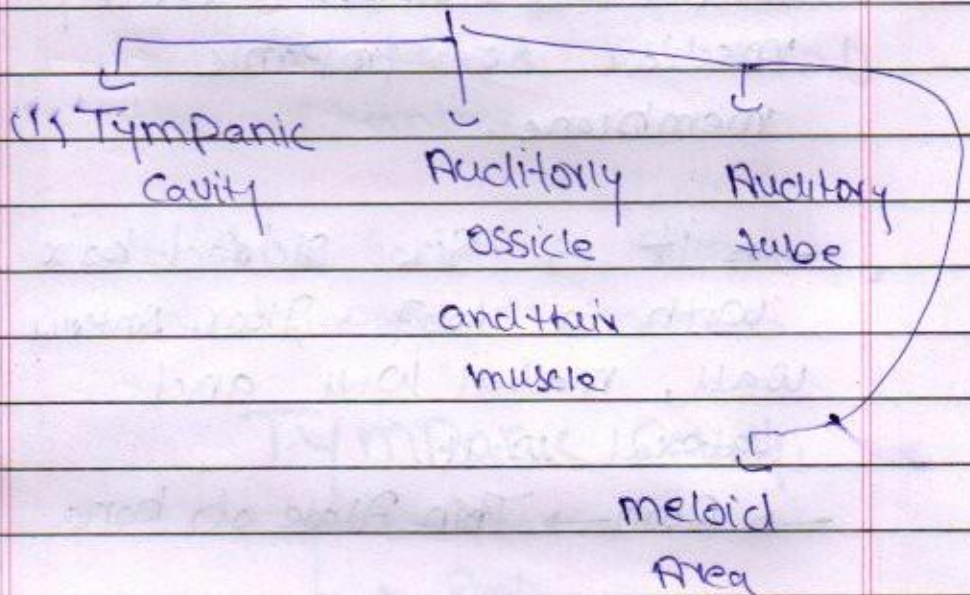
→ The middle ear is the air containing cavity, within the petrous part of temporal bone.

→ Lined with mucus membrane.

→ It communicate with nasopharynx anteriorly and with middle ear cavity posteriorly.

Main Components

Middle Ear



(1) Tympanic Cavity:-

→ It is the main chamber of the middle ear -

→ It consist of two parts

(a) Tympanic Cavity Proper

(b) Epitympanic recess

(A) Tympanic Cavity Proper:-

→ The Tympanic Cavity Proper is the area directly medial to tympanic membrane.

→ It is Six sided box with a roof, floor, Anterior wall, medial wall and lateral wall.

→ Roof → Thin plate of bone.

→ tegmen Tympani.

→ The tegmen Tympani

is a part of Petrous temporal bone.

→ It separate epitympanic recess of tympanic cavity from chana matter.

(b) Epitympanic recess:

→ The epitympanic recess is the upper portion of the Chamber.

→ it is located superiorly to tympanic membrane.

Tympanic cavity:

- Floor
- Roof
- Anterior Wall
- Posterior Wall
- medial wall
- Lateral wall

Auditory ossicles and Associate muscle:

→ it consist of three Auditory ossicles

(1) → Malleus

(2) → Incus

3 → Stapes

(1) Malleus:-

The malleus is the largest ossicle.

→ which contain the following parts:-

→ Head

→ Neck

→ Long Process

→ Anterior Process

→ Lateral Process

Auditory tube:-

(2) Incus:-

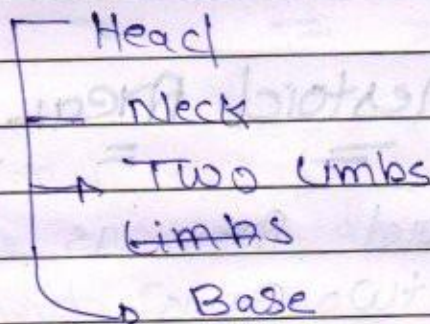
→ Possesses large body.

→ Two Process.

→ Long Process And Short Process.

(3) Stapes:-

The stapes consist of the following parts



Auditory tube:-

→ The Auditory tube connect the Anterior wall of Tympanic cavity to Naso Pharynx.

→ Balancing air Pressure on both sides of tympanic membrane.

→ Allow eardrum to move easily.

→ Medial two third is
Cartilage

→ Lateral two third is
bony

→ mucus membrane lined
the middle ear.

Mastoid Area:

= = The
Mastoid Area is consist
of two parts.

→ (1) Mastoid Antrum

→ (2) Mastoid Air cells

Mastoid Antrum:

= = it is
the main cavity within
the mastoid process.

Mastoid Antrum consist
of the following wall

→ Anterior wall

→ Posterior wall

→ Lateral wall

→ Medial wall

→ Superior wall

→ Inferior wall

Q, Mastoid Air cells:-

→ It is a honey comb like network of hollow space within the mastoid process

Internal Ear:-

→ The Internal Ear is located in Petrous part of temporal bone and medial to middle ear.

→ It consists of

(i) Bony Labyrinth

(ii) Membranous Labyrinth

(i) Bony Labyrinth

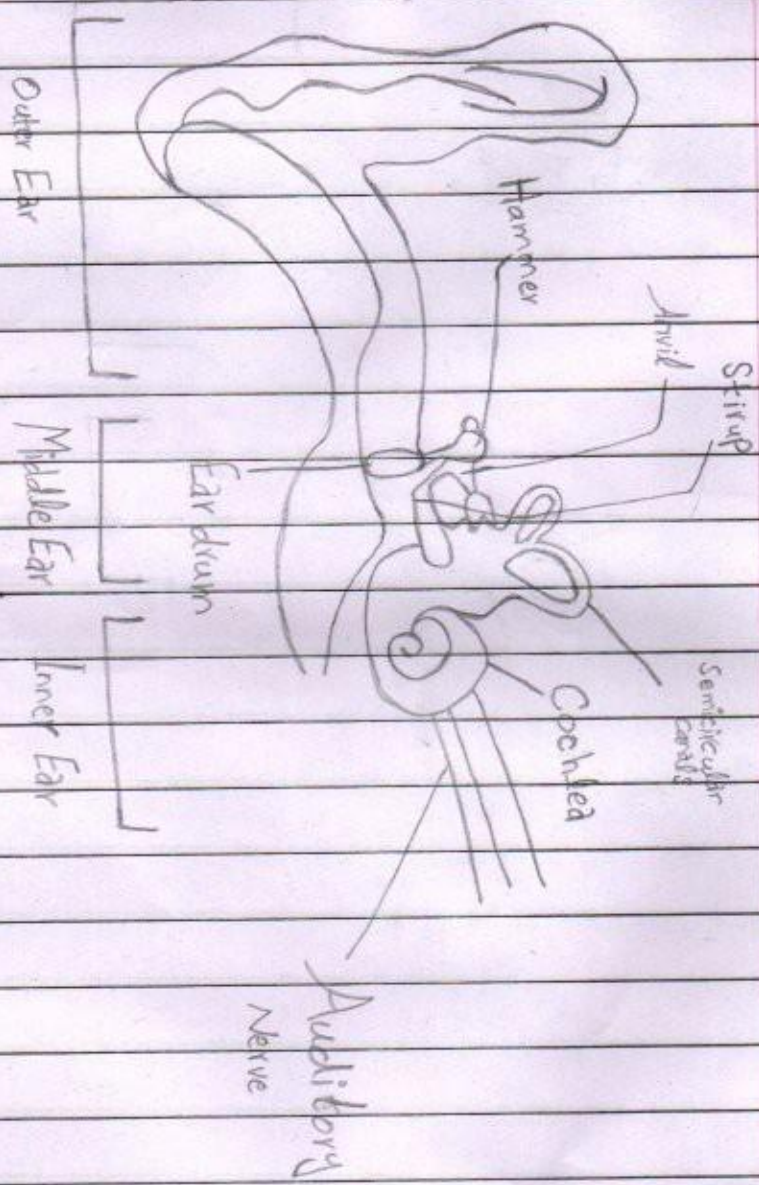
- Vestibula
- Semicircular Canal
- Cochlea

(ii) Membranous Labyrinth

- located
- it is lodged within bony labyrinth
- The membranous labyrinth consist of following parts

- Utricle
- Sacculle
- Three Semicircular ducts
- Ductus of Cochlea





Q No 2

ANS:- Submandibular

Gland:-

→ This gland is located in the face

→ The submandibular glands are bilateral serous salivary gland

→ This salivary gland secrete mixed serous and mucous secretion one important for the lubrication of food during mastication to enable effective swallowing and oral digestion.

Histology:-

This glandular mass is responsible for the production of 70% of the overall salivary output

→ it secretes both serous and mucinous saliva.

Anatomical Position:-

The submandibular gland is the second of the three major head salivary glands, after the parotid and before the sublingual gland

→ it is situated both superiorly and inferiorly to the posterior aspect of the mandible

in the submandibular triangle of the Neck and makes up part of the floor of oral cavity.

Boundaries of

submandibular triangle:-

→ Superiorly:-
inferior body of the mandible

→ Anteriorly:-
Anterior belly of the digastric muscle

→ Posteriorly:-
Posterior belly of the digastric muscle.

Anatomical Structure:

→ Structurally, the submandibular glands are a pair of elongate flattened hooks,

which have two sets of arm, superficial and deep. The positioning of these arms is in relation to the mylohyoid muscle,

→ which the gland hooks around.

→ Superficial arms:

→ it comprises the greater portion of the gland and lies partially inferior to the mandible ^{or} posterior

the mandible.

→ with in the impression

on its medial aspect

→ it is situated outside the boundaries of the oral cavity

→ Deep Arm:-

Hooks around the posterior margin of mylohyoid through a triangular aperture to enter the oral cavity. Proper.

→ it lies on the lateral surface of the hyoglossus, lateral to the root of the tongue.

Wharton's duct:-

it is also called submandibular duct. arises from this deep of the gland.

→ And runs forward.

→ Beneath the mucosa

of the mouth along

the side of the tongue.

→ To open immediately
at the side of the
Frenulum Linguae.

→ The duct ascends
on its course to
open as 1-3 orifices
on small sublingual
Papilla

→ The duct is
about 5cm in length

→ The Submandibular
Secrets Saliva through
this ducts.

Relationship with

Nerves:-

The submandibular gland and duct both share close anatomical relationship with three main nerves.

→ Lingual Nerve

→ Hypoglossal Nerve

→ Facial Nerve

(i) Lingual Nerve:-

- Beginning laterally and looping antero-medially of submandibular duct
- it innervates 2-3rd of tongue mucos membrane.

(ii) Hypoglossal Nerve.

→ it is situated deep to the submandibular gland and runs superficial to hypoglossus and deep to diaphragm muscle.

(iii) Facial Nerve.

→ Passed parotid gland at antero-posterior portion at the angle of jaw and curving down inferior to the submandibular gland.

Blood Supply.

→ The facial and lingual arteries contribute to the blood supply of the submandibular gland.

→ And turns their
Venous drainage is
provided by corresponding
vein.

Innervation:

The
secretory mechanism
of the submandibular
gland is regulated
directly by parasympathetic
nervous system and
indirectly sympathetic
nervous system.

Parasympathetic

it is
controlled by

→ Facial Nerve

→ mandibular nerve

Sympathetic:

→ regulated by

→ Superior Cervical ganglion

→ vasoconstrictor fiber plexus.

Sublingual gland

→ The sublingual glands are the smallest of the three major pairs of head salivary glands.

→ And situated very deep.

→ These pair only produce 3-5% of all salivary volume.

→ Lubricate mouth and food for easy mastication and swallowing.

Anatomical Position:

→ The sublingual gland lies beneath the mucous membrane (sublingual fold) of the floor of the mouth.

Close to the frenulum
of the tongue

→ It has both serous
and mucous acini with
latter predominating

→ The sublingual ducts
(8 to 20 in number)

→ Open into the mouth
on the summit of
the sublingual fold.

Structure:-

It is almond
shaped (oval) situated
under the tongue

Borders:-

The sublingual
gland border by the
mandible anteriorly
and the genio glossus
muscle posteriorly

→ it is covered superiorly by the tongue.

→ numerous cilia can be seen secreting saliva along the organ of the sublingual fold.

Histology:-

→ In opposition to the parotid gland

→ it secret entirely mucinous saliva about 3-4% of all saliva

Nerve supply:-

→ Para sympathetic secretion supply is from the facial nerve via the chorda tympani and submandibular ganglion

→ Post ganglionic fibers passed directly to gland

Blood supply:-

→ Arterial supply is from

→ Sublingual artery

→ Submental artery

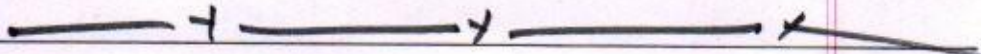
→ Venous supply is from

→ Sublingual vein

→ Submental vein

Lymphatic:-

→ Submandibular lymph nodes.



Q No 3

Stone formation in

submandibular gland:-

Ans:-

= It is also called sialolithiasis, which means salivary calculi or salivary stone.

→ It is a condition where a calcified mass or sialolith forms within a salivary gland.

→ It usually occurs in the duct of the submandibular gland also termed as "Wharton's duct"

→ Less commonly occur in the parotid gland

→ Rarely occur in the sublingual gland.

→ Sialolithiasis may also develop because of the presence of existing chronic infection of the gland, dehydration

→ e.g. use of phenothiazines, Sjogren's Syndrome and/or increase local levels of calcium.

→ But in many instances the cause is idiopathic (unknown).

→ If a calculus forms in the ducts that drains the saliva from a salivary gland into the mouth, then saliva will be trapped in the gland.

→ This may cause painful swelling and inflammation of the gland.

→ Inflammation associated with blockage of the duct is also termed as "Sialadenitis" which cause Salivary Calculi

Division

Salivary stones may be divided according to which gland they form in.

→ About 85% of the stone occur in the submandibular gland

→ 5-10% occur in the Parotid gland

→ 0-5% occur in the sublingual gland.

→ minor gland is little bit affected

→ e.g buccal mucosa
And maxillary labial
mucosa-

Reason Formation

of Stone in Sub

mandibular Gland:-

→ Stone formation occurs most commonly in the submandibular gland for several reasons-

→ The concentration of calcium in saliva produced by the submandibular gland is twice that of the saliva produced by the parotid gland-

→ The submandibular gland saliva is also relatively "alkaline" and mucous-

→ The submandibular duct (Wharton's duct) is long meaning that saliva secretions must travel further before being discharged into the mouth.

→ The duct possesses two bends, the first at the posterior border of the "mylohyoid muscle" and the second near the duct orifice.

→ The flow of saliva from the submandibular gland is often against gravity due to variations in the location of the duct orifice.

→ The orifice itself is smaller than that of the parotid.

→ These factors all promote slowing and stasis of saliva in the submandibular duct.

→ Making the formation of an obstruction with subsequent calcification more likely.

→ So these are the reason in which stone formation occur more likely in submandibular gland.

Symptom:-

- Swelling
- Difficulty in opening the mouth
- Difficulty in swallowing
- Dry mouth
- Pain
- Gritty or sand string tasting in saliva.

Diagnosis:-

- CT
- MRI
- Sialograph

Treatment:-

- Drinking plenty of water to facilitate small stone
- For large stone surgery is required.



Q No 4

Ans

Vertebrae's of

Human Skelton:-

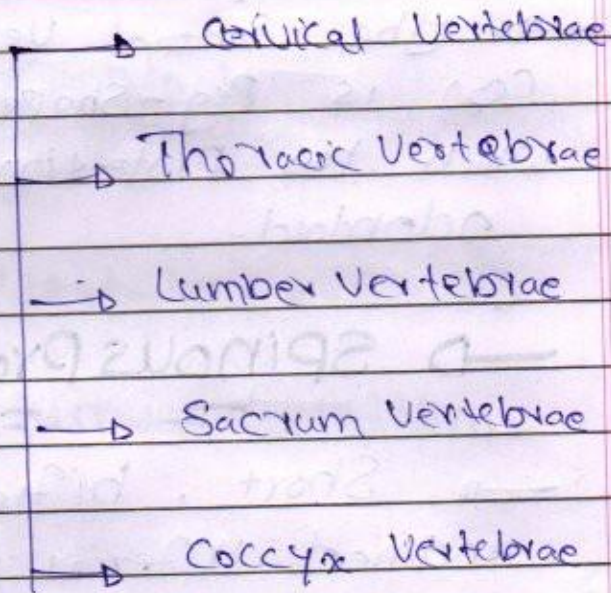
→ The vertebra within region possess distinctive distinguishing feature

→ Vertebrae are 33 individual bones that are interlock with each other to form the spinal column

→ Only 24 bones are movable

→ Sacrum and coccyx are fused.

→ The vertebrae are numbered and divided into regions.



C) Cervical Vertebrae:-

The body Cervical Vertebrae is smaller and transversely broad

→ No Costal Facet

→ Support weight of Head

→ There are seven Cervical Vertebrae (C1 - C7)

→ First Vertebrae C1 is ring shaped atlas that connect directly to skull.

→ The second vertebra (C2) is Peg-shaped axis, which has protection called Odontoid.

→ Spinous Process:-

→ Short, bifid and inclined inferiorly

Transverse Process:-

Poses a foramen transversarium for passage of vertebral artery and veins

→ Articular Process:-

→ Relatively flat facet

→ facet on superior

→ articular process face superiorly and posteriorly

→ Body:-

Small and
transversely broad

→ No Costal facets

Interlaminar Space

→ The interlaminar
space of Cervical (C3-C6)
vertebrae is small

② Thoracic Vertebrae:-

→ Twelve Thoracic
vertebrae are numbered
T₁ - T₁₂

→ It hold rib cage
and protect the heart
and lungs

→ Range of motion is
limited

Body :-

medium size
vertebrae
Valentine Heart
Shape.

→ Posterior inferior
corner for articulation
with the head of ribs

→ P.

Vertebral Foramen

→ Small and circular

Spinous Process

→ Long and inclined
inferiorly

→ Thoracic spine overlaps
a shingle like pattern

→ Transverse Process

→ No Foramen transversarium

→ Possess a Costal Facet for articulation with tubercle of rib

Note:-

T₁₁ and T₁₂ do not have costal facet.

Articular Process:-

→ Relatively flat facets.

→ facet on superior

→ articular process face anteriorly and medially

Note:-

Facet on inferior process of T₁₂ face laterally in typical lumbar fashion

3) Lumbar Vertebrae

→ Five vertebrae are numbered L1-L5

→ much larger in size

→ lifting and carrying heavy objects

Body:

Large and kidney shape

Spinous Process:

→ short, flat, quadrangular and projecting posteriorly

Transverse Process:

→ no foramen transversarium

→ No Costal Facets

Articular Processes

→ Curved Facet
→ Facet on superior articular processes are concave and face medially

→ Facet on inferior process are convex and face laterally

(4) Sacrum:

There are five sacral vertebrae which are fused together

→ It connects the spine with hip bones

→ Together with iliac bone form a ring called the pelvic girdle

Base :-

The upper border
of base articulate with
7th Lumbar Vertebrae

Apex :-

Articulate with
Coccyx

Laterally :-

It laterally
Sacrum articulate with
two iliac bones to
form the Sacroiliac
joint.

⇒ Sacral Promontory

⇒ Sacral Canal :-

Vertebral Canal continues
into Sacrum where it
form Sacral canal.

→ it contain the caudal
eyling

⇒ Sacral hiatus:-

→ The laminae of
fifth sacral vertebra and
sometimes of fourth
fail to meet in the mid
line the Sacral hiatus

(5) Coccyx:-

→ ~~less~~ usually consist of
four vertebrae fused
together to form a
single small triangular
bone that articulate
as its base with lower
end of Sacrum

→ It may have only
three vertebrae or
five vertebrae

→ first coccygeal vertebrae
is not fused or is

incompletely fused with
second vertebra.

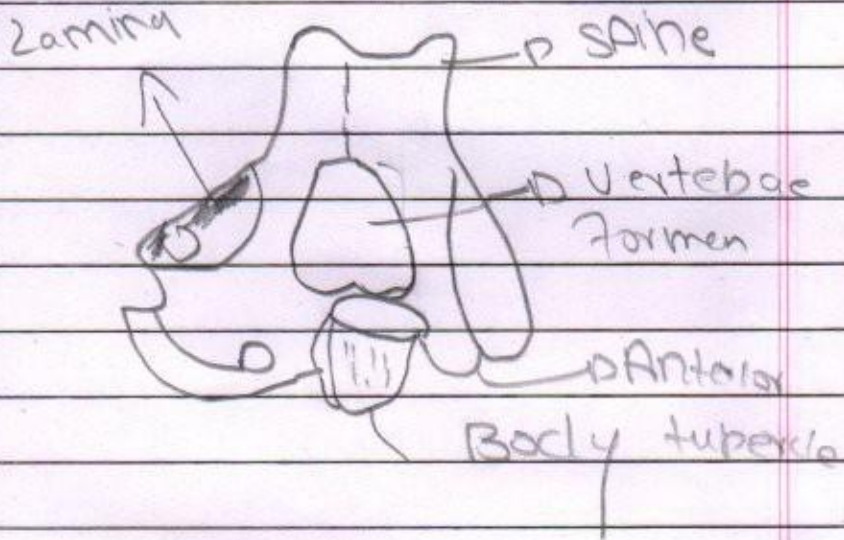
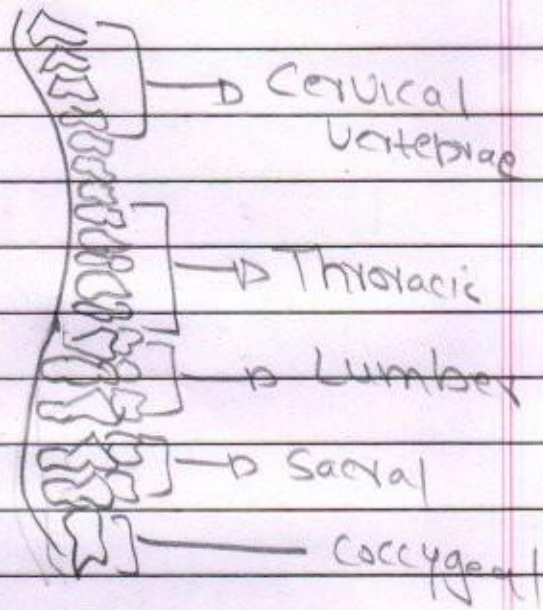


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The laminae of
the second vertebra
are fused to the
body of the second
vertebra.

(2) Coccyx

The coccyx is a
small cartilaginous
structure at the
end of the spine.
It is formed by
the fusion of
four vertebrae.
The coccyx is
not fused to the
rest of the spine.



Q No 5

importance of
Radiology in
medical field:-

ANS:-

= Radiology is all about imaging for medical purposes.

→ it includes Radiographers, Radiologists, Sonographers, Biomedical engineers, Nurses, medical physicists and other support staff.

→ There is a lot of importance of Radiology in medical field some of which are given below -

→ Radiology is the key diagnostic tool for many disease and has important role in monitoring Treatment and predicting outcome.

→ it has a number of imaging modalities which play a crucial role in medical care.

X-Rays:-

Radiology started with the x-ray which changed the field of medicine forever.

→ The ability to use imaging to see inside the body,

→ Diagnose a broken bone, diagnose disease and so much more has made radiology necessary for medical field.

→ X-rays use radiation to look through the body and see foreign objects and bones.

→ This allows physicians to better diagnose anything wrong with the bone structure or other disease which leads to the proper course of treatment.

Other imaging.

Along with the X-ray, radiology has grown to include other imaging technology such as CT, MRI, fluoroscopy and angiography.

→ These different technologies allow for real-time imaging of the digestive system, looking at the blood vessels, providing 2D and 3D maps of

Tissue within the body
and providing cross-section
views of the body.

→ Without these technologies
it would be very difficult
for physicians to diagnose
many of the common
disease Today.

Doctors Rely on Radio-

graphers:-

In today's
medical field, Doctors
rely heavily on radiographers.
They need accurate tests
to be able to diagnose
the issue and provide the
proper treatment.

Central to Disease management:-

With so
many horrific diseases

It's important to have a
Good disease management
plan.

→ Radiology plays a
huge role in disease
management by giving
Physicians more options, tools,
and techniques for detection
and treatment.

Diagnostic imaging.

→ Diagnostic imaging
allows for detailed
information about structural
or disease-related changes.

→ It has the ability to
diagnose during early
stages, patients may be
saved.

→ Without radiology, this
may not be possible.

→ When it all comes down to
it.

→ Radiology saves lives.

→ It's vital to medical care

because it's one of the most powerful diagnostic and treatment tools available.

→ And it will be much harder to even fix something as simple as a broken bone.

→ Diagnostic imaging allows for better treatment and a better look at what's really going on within the body.

The Value of

Radiology in Health

Care:-

Radiology play a very important role in health care.

Prevention and Screening:-

→ The value of screening leads to early detection, staging and treatment.

Treatment and Therapy:-

→ Treatment monitoring with imaging and diagnostic methods.

→ Now a days Radiology also play a very important role in the treatment of cancer, stone and many other disease.

→ it reduces the need for exploratory surgeries.

→ Guiding treatment of common condition such as injury, cardiac disease and stroke.

interventional Radio-

logy:-

it involves treatment as well as diagnosis,
→ involves less risks, a shorter recovery time and less time in hospital than open surgery or key hole laproscopic surgery.

Nuclear medicine:-

its scans are used in diagnosis and to see how internal organs are functioning.

Quotes:-

"Radiology is the key to identifying what's wrong with internal functions of your body."

