Pharynx

- Musculo Membranous Tube

**Situation**
- behind nasal, oral cavity, larynx, lined by mucous memb. (internally)
- Continues below with oesophagus

**Extent** - base of skull to C6

**Measurements**
- **Length** – 12-14 cm
- **Width**
  - Max – 3.5 cm – naso–pharynx
  - Min – 1.5 cm at pharyngo-oesophageal junction
Interior of pharynx
three parts

- Naso- pharynx
- Oro- pharynx
- Laryngo- pharynx

Anterior communications
Nasal cavity – post.nasal aperture
Oral cavity - oro-pharyngeal isthmus
Larynx - laryngeal inlet
External Relations

Above
- body of Sphenoid & basilar part of occipital bone

Below
- Continue with oesophagus
Behind

- Upper 6 cervical vertebra & disk
- Pre and Para vertebral muscles covered by prevertebral fascia
- Retropharyngeal space and their contents

On each side

- Related to styloid process, styloid group of muscles
- Carotid sheath & its contents
- Thyroid glands – lateral lobe
Lateral Communication

Lateral wall of nasopharynx communicating with tympanic cavity through auditory tube
Naso-Pharynx

Situation

- behind nasal cavity & above soft palate & passvants ridge
- communicate inferiorly with oropharynx through pharyngeal isthmus
- Forms upper respiratory passage – lined by ciliated columnar epithelium
- Wall are immovable & non-collapsible

Ant. Wall

- Deficient – communicate with nasal cavity through the choanae
Naso-Pharynx

Fascial Layers of Neck
Sagittal Section

Roof and post. Wall

- Continuous surface, slopes downward and backward

- Supported by
  - body of sphenoid
  - basilar part of occipital bone
  - ant. Arch of atlas
Pharyngeal opening of auditory tube
triangular in shape
1.25 cm behind & below the post. end of inf. nasal concha

Tubal elevation
• Guard upper & post. margin of auditory opening
• Submucous lymphoid collection overlis tubal elevation is called tubal tonsil
• Salpingo-phryngeal fold
• Pharyngeal recess
Naso- Pharynx - Features

Naso- pharyngeal tonsil

- Aggregation of lymphoid tissue below mucous membrane
- Projects down & forward as conical mass
- Usually more prominent in children
- Called Adenoids when enlarged in infection
- Obstruct nasal respiration (Mouth breathing)
Oropharynx

- Middle part of pharynx
- lie behind oral cavity
- Common passage for both air & food
- Communicate above with naso-pharynx through pharyngeal isthmus
- In front with oral cavity by oropharyngeal isthmus (closed during deglutition to prevent regurgitation)
- Below to laryngo-pharynx at level of upper border of epiglottis
Oropharynx

- Supported behind by body of Axis and C3
- Lateral wall contain palatine tonsil in tonsillar fossa bounded anterioly by palato-glossal arch and post. By palato-pharyngeal arch
- Wall of oropharynx formed posteriorly by three constrictor muscles
Laryngopharynx

- Extend from upper border of epiglottis to lower border of cricoid cartilage

- Supported behind by bodies of C4 – C6, prevertebral fascia & retropharyngeal space

- Anterior wall has laryngeal inlet in upper part & piriform fossa in lateral side if laryngeal inlet
Wall of Pharynx

From inside out – 4 coats

- Mucous
- Submucous
- Muscular
- Areolar coat
Wall of Pharynx

Mucous membrane

- **Naso-pharynx** mostly lined by ciliated columnar epithelium (Respiratory epithelium)
- **Oro-pharynx** and **Laryngo-pharynx** lined by St. Sq. Non Keratinized Epithelium
- **Transitional zone** of non-ciliated extend across the lower part of naso-pharynx below pharyngeal opening of Auditory tube
Walls of Pharynx

Submucous coat

- Thickened in upper part to form pharyngo-basilar fascia & is attached to base of skull
- Also called as pharyngeal aponeurosis & is pierced by auditory tube
Walls of Pharynx

Muscular coat

• Consist of striated muscles
• Arranged in
  outer circular &
  inner longitudinal layers
Constrictor Muscles

Circular layer – 3 constrictor muscles
- Superior constrictor (Quadrilateral)
- Middle constrictor (Fan)
- Inferior constrictor (Thickest)-
  - Thyro-pharyngeus &
  - Crico-pharyngeus
Constrictors

- Limited origin from front
- Expanded insertion behind in median fibrous raphe (Pharyngeal tubercle of basiocciput ---pharyngo-oesophageal junction)
- Close to insertion overlap from below upward
- Leave gaps to allow structures to pass
Constrictor Muscles - Pharynx

Longitudinal – Three paired muscles
- Stylo-pharyngeus
- Palato-pharyngeus
- Salpingo-pharyngeus

Common Action
Elevate larynx & shorten pharynx during swallowing
Gaps & Structures Passing

Base of Skull & upper border (Sup. Cons.)

- Auditory tube
- Lavator palatini muscle
- Ascending palatine Artery
- Palatine br. of Ascending Pharyngeal Artery

Superior & Middle constrictor

- Stylo-pharyngeus muscle
- Glossopharyngeal nerve
Gaps & Structures Passing

Middle & Inferior Constrictor
(pierce thyrohyoid memb.)
- Internal laryngeal nerve
- Superior laryngeal vessels

Inferior constrictor & oesopagus (T-O Groove)
- Recurrent laryngeal nerve
- Inferior laryngeal vessels
Areolar coat

- Called **bucco-pharyngeal fascia**
- Covers as loose areolar memb. To the outer surface of constrictors
- Attached above to base of skull
- Form ant. Boundary of retropharyngeal space
Nerve Supply (Motor)

- All supplied by cranial part of accessory nerve via pharyngeal plexus except Stylopharyngeus which is supplied by glossopharyngeal nerve

- Inf. Constrictor in addition is supplied by recurrent laryngeal & external laryngeal nerves
Sensory

- Naso-pharynx – pharyngeal br. of pterygopalatine ganglion conveying fibres of maxillary nerve
- Oro-pharynx – glossopharyngeal nerve
- Laryngo-pharynx – internal laryngeal nerve

Arterial supply

- Ascending pharyngeal
- Ascending palatine & tonsillar branches (Facial)
- Greater palatine, pharyngeal, pterygoid br. of maxillary artery
- Dorsal lingual br. of lingual artery

Veins – form plexus, joins with pterygoid venous plexus & drain in IJV
Deglutition (Swallowing)

• Complicated neuromuscular act of transfer of food from mouth to the stomach through pharynx and oesophagus

• Three successive stages

• First stage – in mouth – voluntary

• Second – in pharynx – Involuntary

• Third – in oesophagus – involuntary
First stage

- Masticated food or bolus placed on dorsum of tongue
- **Longitudinal groove** - by sup. Longitudinal, vertical & genioglossus
- **Contraction of mylohyoid** – raises floor of mouth – compression of tongue against hard palate (in closed mouth)
- Forcing bolus to pass in oropharynx
Second stage

Bolus – three wrong ways to pass
• Regurgitate back to mouth
• Upward to nasopharynx
• Downward & forward into laryngopharynx

Prevention

Oropharyngeal isthmus closed by
- contraction of styloglossus – pull tongue upward & backward
- Palatoglossus – narrow palatoglossal arch & pull root of tongue upward to soft palate

Pharyngeal isthmus closed by
- Elevation of soft palate – levator palatini
- Tightning of Soft Palate – Tensor veli palatini
- Soft Palate come in contact with post wall of pharynx by palatopharyngeus
Changes in larynx

- Laryngeal inlet drawn upward by thyro hyoid, stylopharyngeus, palatopharyngeus & salpingopharyngeus
- Laryngeal inlet closed by aryepiglotticus muscle

Passage of bolus Fascilated by

- Contraction of constrictors of pharynx
- Shortening & elevation of pharynx by palatopharyngeus
- Propulsion by thyro-pharyngeus followed by relaxation of the sphincteric action of cricopharyngeus

Third stage – bolus passes down the oesophagus by peristalsis