Pharynx

- Musculo Membranous Tube

Situation

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

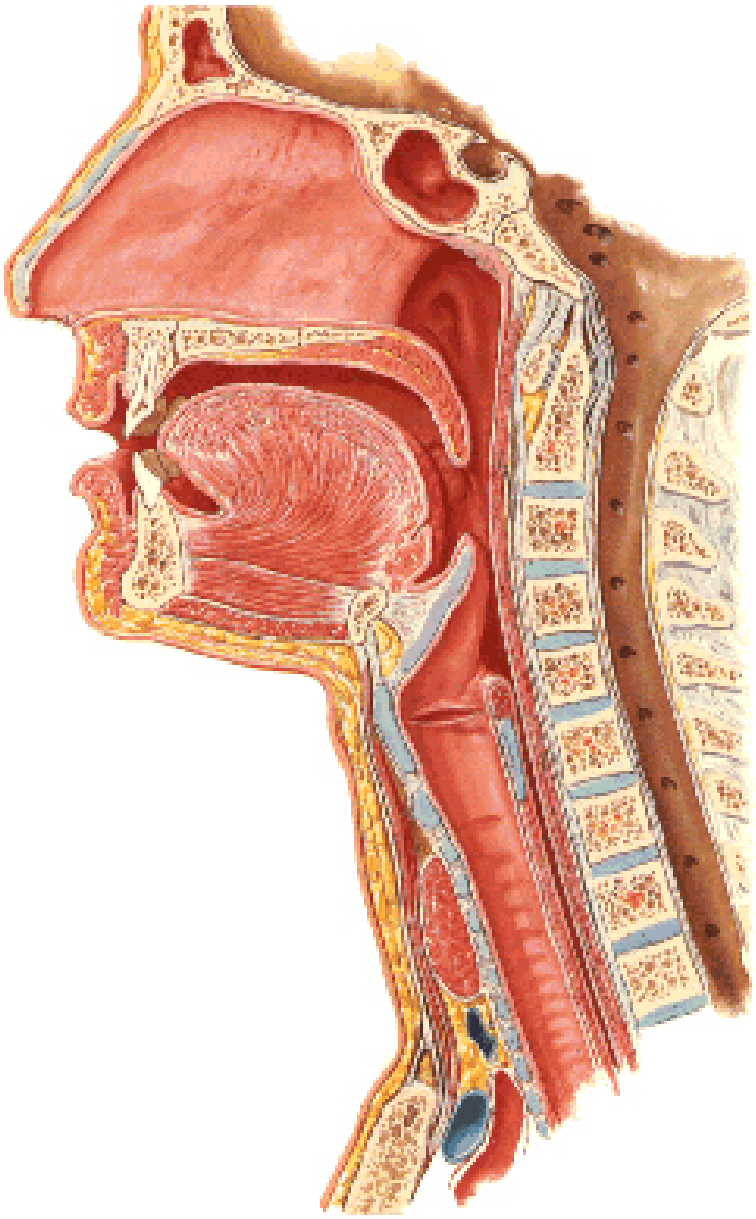
Extent - base of skull to C6

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

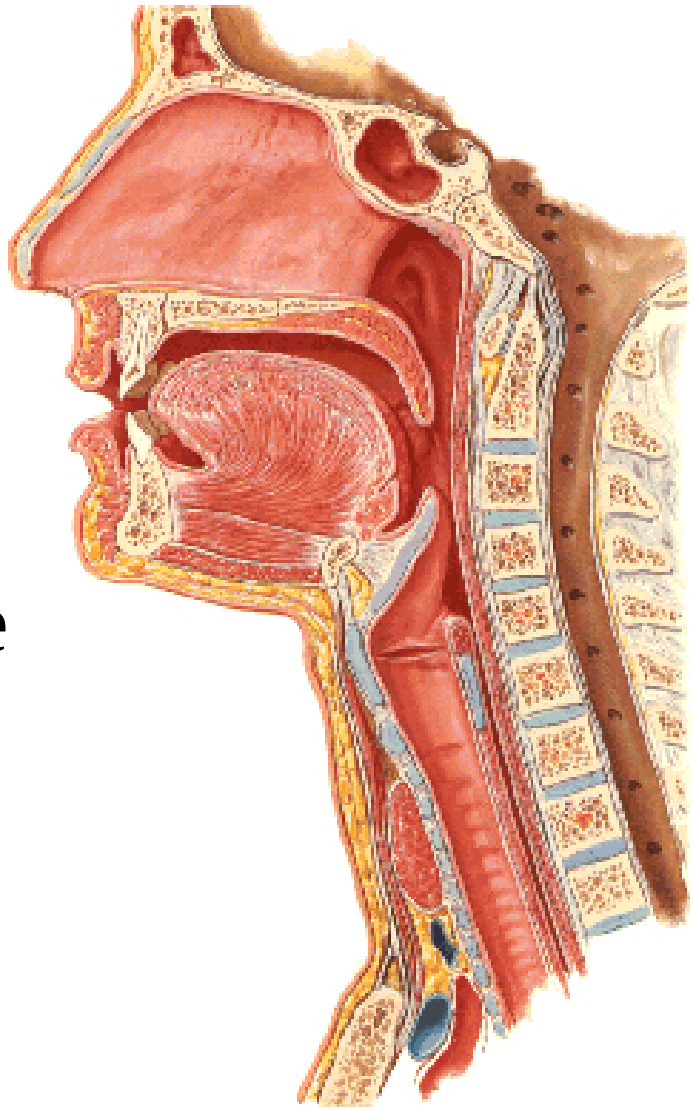
- Naso- pharynx
- Oro- pharynx
- Laryngo- pharynx

Anterior communications

Nasal cavity – post.nasal aperture

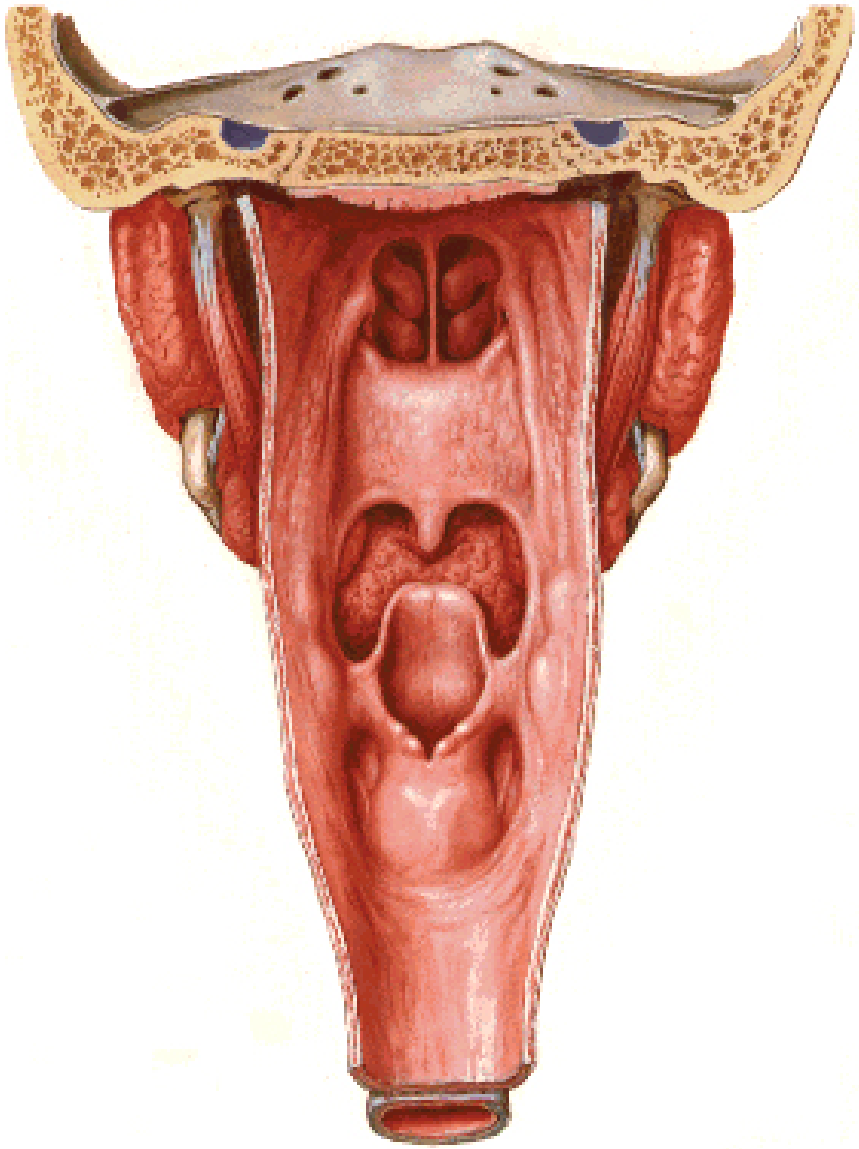
Oral cavity - oro-pharyngeal isthmus

Larynx - laryngeal inlet

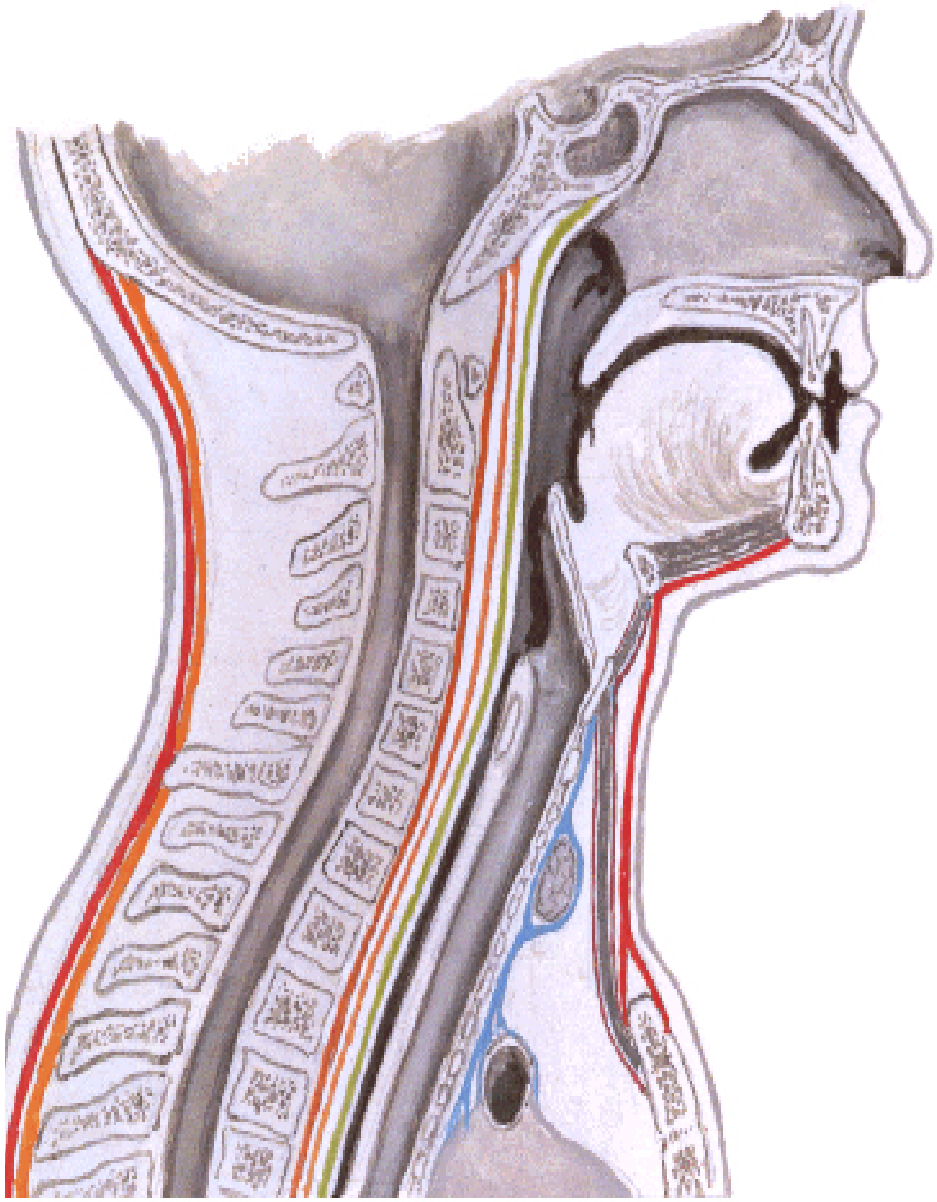


Pharynx

Opened Posterior View



Sagittal Section



External Relations

Above

- body of Sphenoid & basilar part of occipital bone

Below

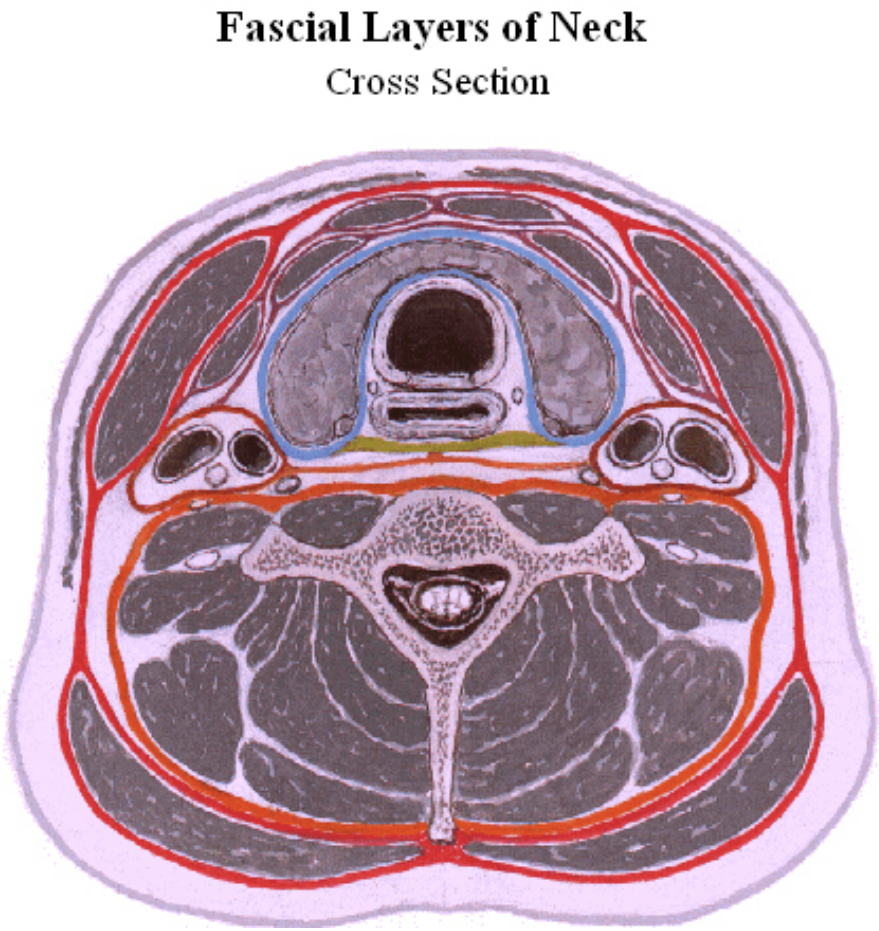
- Continue with oesophagus

Behind

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

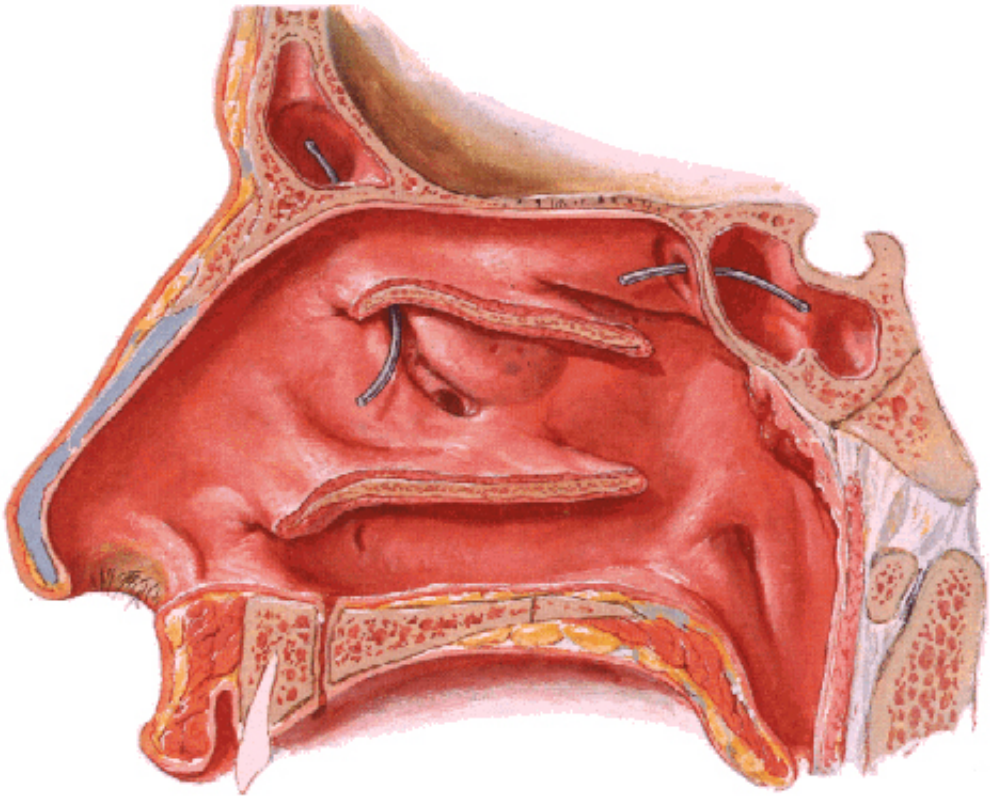
On each side

- 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 auditary tube



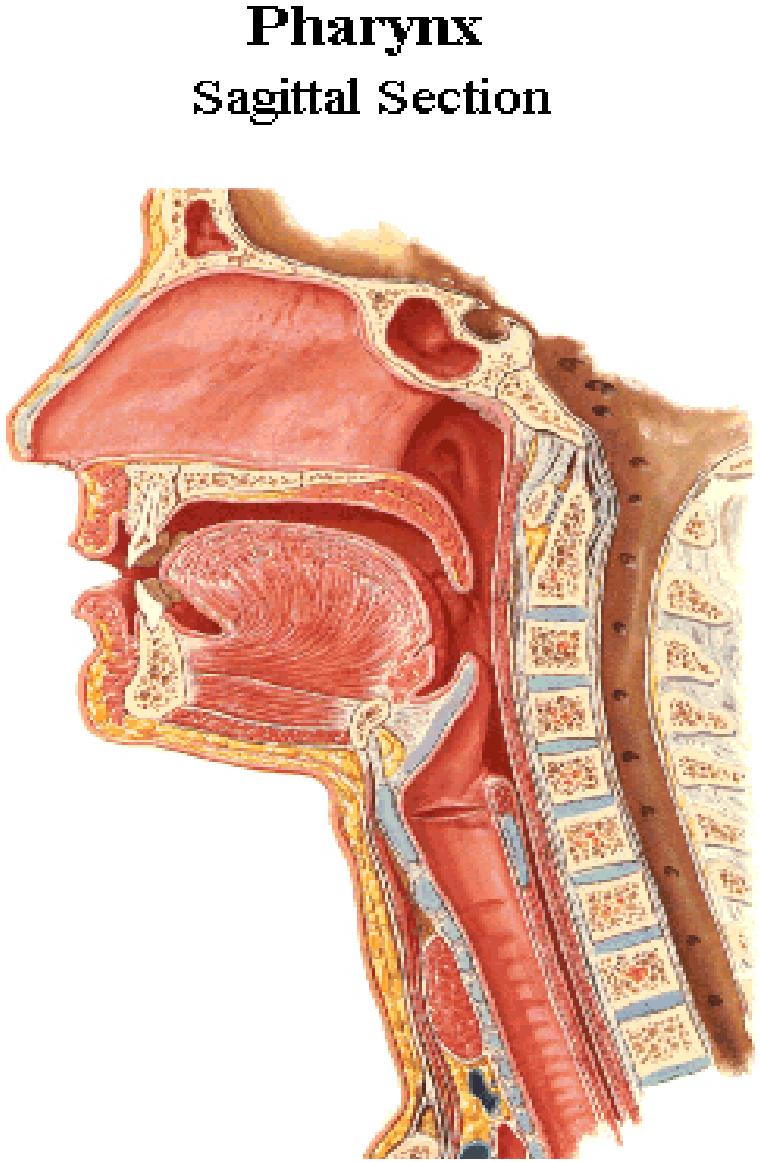
Naso- Pharynx

Situation

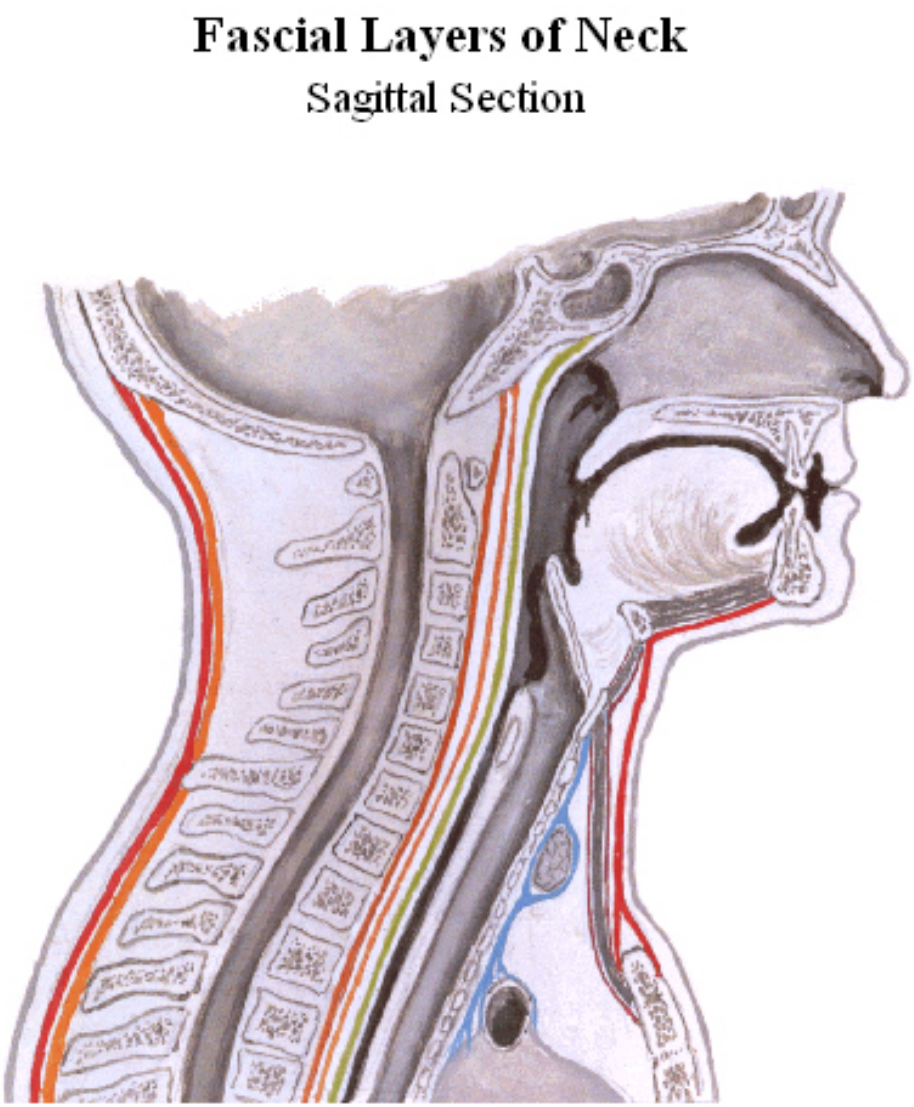
- behind nasal cavity & above soft palate & passvants ridge
- communicate inferiorly with oropharyx through pharyngeal isthmus
- Forms upper respiratory passage – lined by ciliated columnar epithelium
- Wall are immovable & non-collapsable

Ant. Wall

- Deficient – communicate with nasal cavity through the choanae



Naso- Pharynx



Roof and post. Wall

- Continuous surface , slopes downward and backward

- Supported by
  - body of sphenoid
  - basilar part of occipital bone
  - ant. Arch of atlas

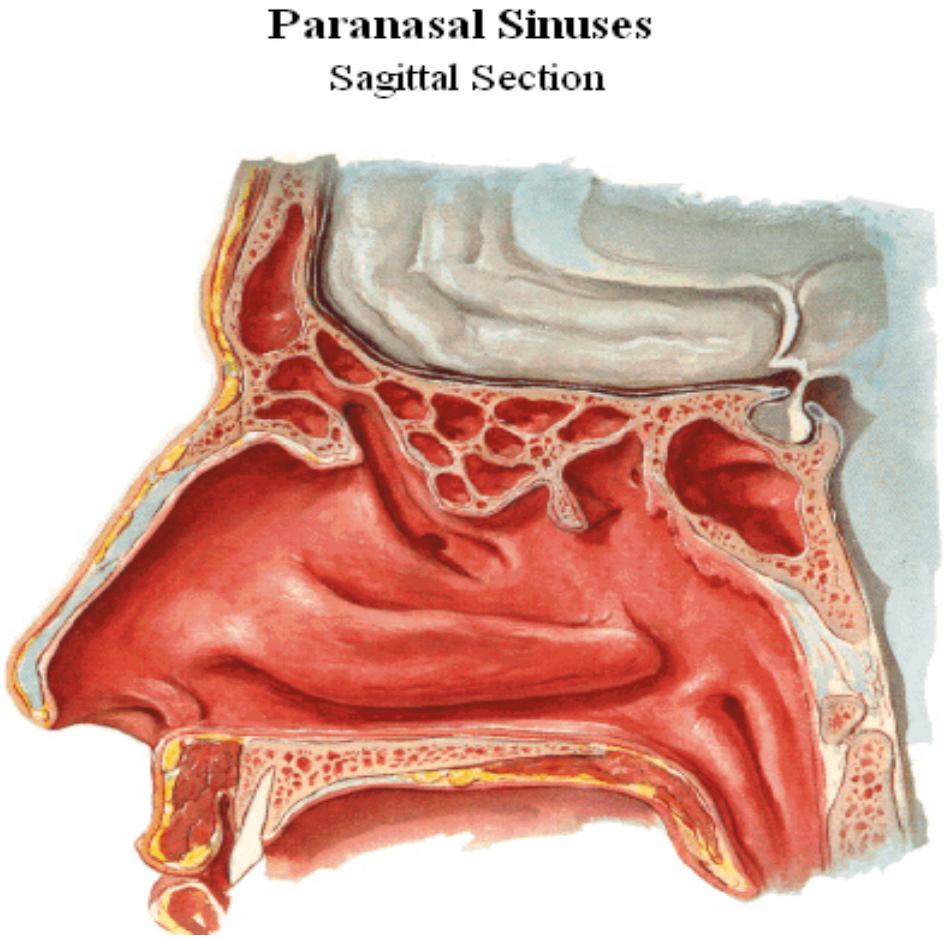
Pharyngeal opening of auditory tube

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

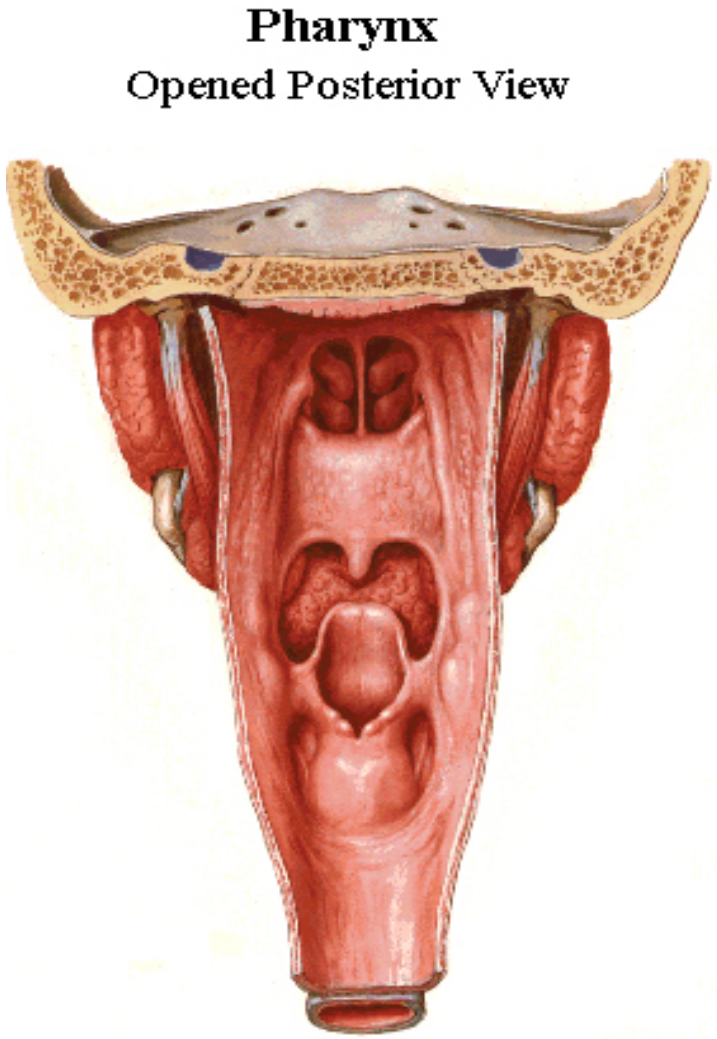
- Middle part of pharynx
- lie behind oral cavity
- Common passage for both air & food
- Communicate above with naso-pharynx through pharyngeal isthmus
- In front with oral cavity by oropharyngeal isthmus (closed during deglutition to prevent regurgitation)
- Below to laryngo-pharynx at level of upper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

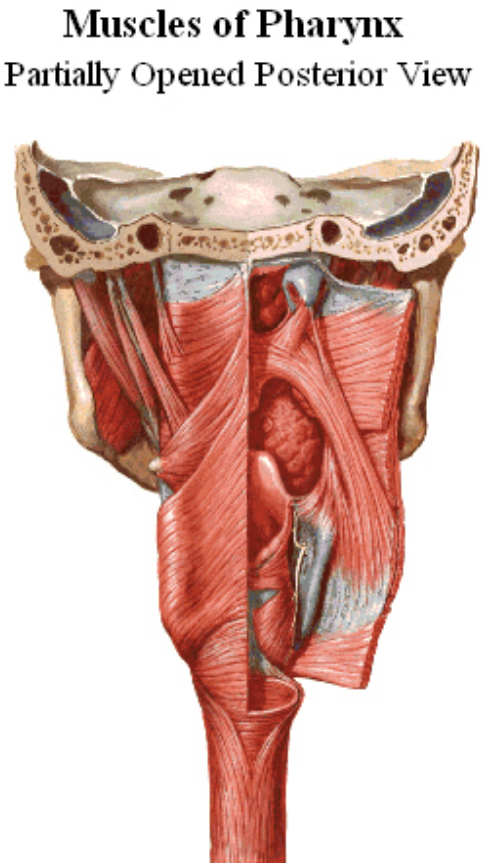
  outer circular &

  inner longitudinal layers

Constrictor Muscles

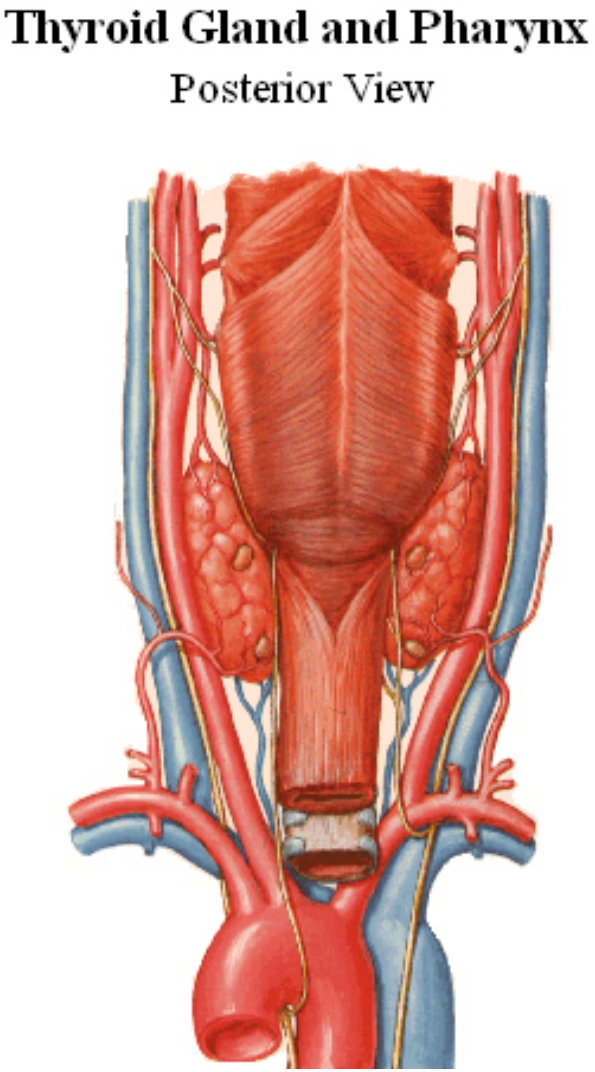
Circular layer – 3 constrictor muscles

- Superior constrictor (Quadrilateral)
- Middle constrictor (Fan)
- Inferior constrictor (Thickest)-
  - Thyro-pharyngeus &
  - Crico-pharyngeus



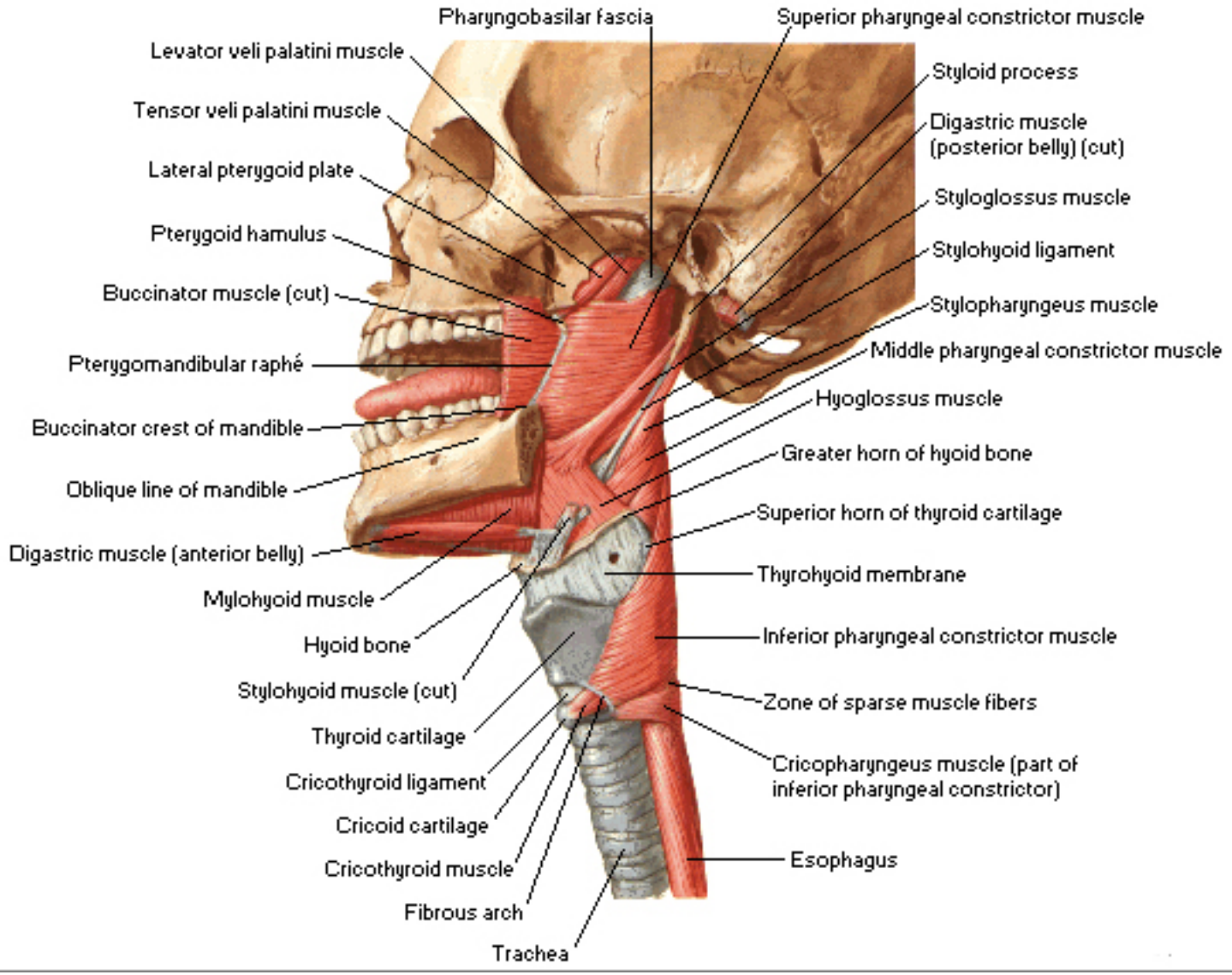
Constrictors

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



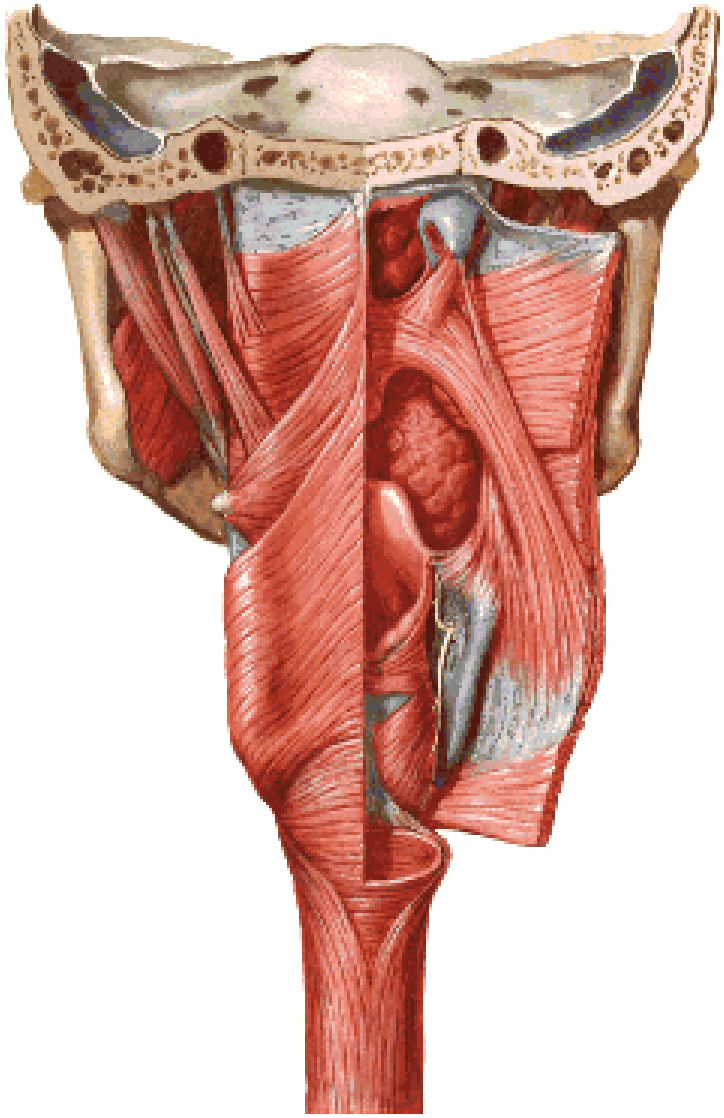
Muscles of Pharynx

Lateral View



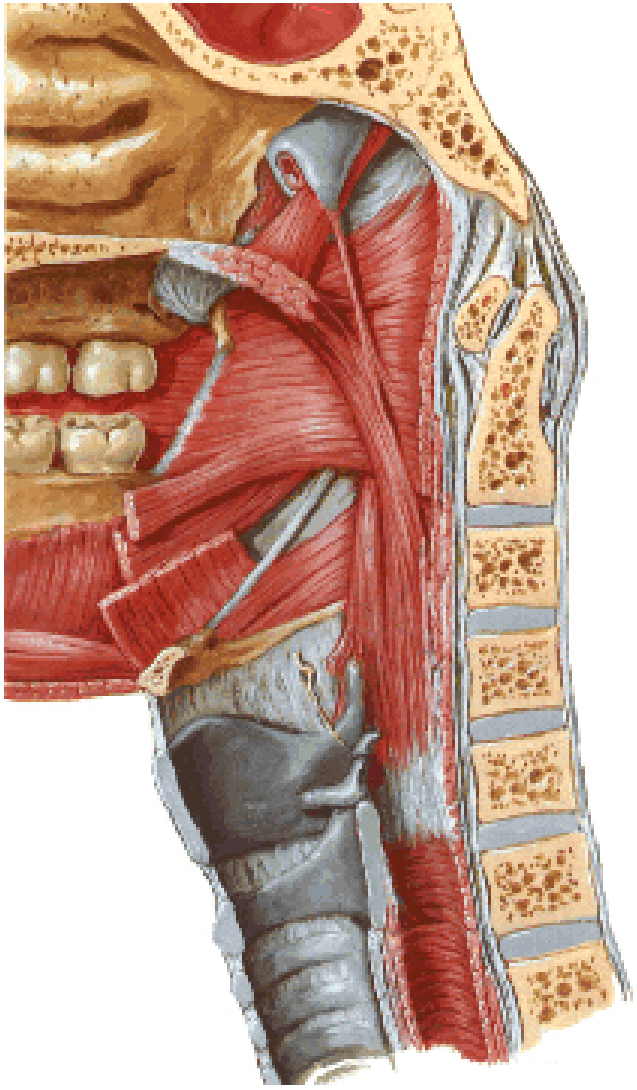
Muscles of Pharynx

Partially Opened Posterior View



Muscles of Pharynx

Sagittal Section



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 & oesopgagus (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 Stylo-pharyngeus which is supplied by glossopharyngeal nerve
- Inf. Constrictor in addition is supplied by recurrent laryngeal & external laryngeal nerves

Sensory

- Naso-pharynx – pharygeal 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 successsive 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
- Shortning & 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 peristalis