**Carotid Sheath Anatomy**

The carotid sheath extends from the arch of the aorta to the base of the skull. Upper part is attached to the margins of the carotid canal in the petrous bone. Here it contains the internal carotid artery and internal jugular vein, and the last four cranial nerves.

Between the internal and external carotid pass the styloglossus muscle, stylopharyngeus muscle, stylohyoid ligament, glossopharyngeal nerve, pharyngeal branch of the vagus, and if present, the track of a branchial fistula. Ie all the ‘ph’ structures + styloglossus and stylohyoid ligament.

Superficial to the external carotid pass the hypoglossal nerve, posterior belly of digastric and stylohyoid muscle.

Deep to both lies the superior laryngeal nerve from the vagus and its terminal branches, the external and internal laryngeal nerves.

**Glossopharyngeal nerve**

Nerve of the third pharyngeal arch. Emerges from jugular foramen on the lateral side of the inferior petrosal sinus.

Branches
- tympanic branch (jacobsens nerve) which enters tympanic canaliculus to supply middle ear, mastoid air cells and bony part of auditory tube with sensory fibres. Also carries parasympathetic fibres from inferior salivary nucleus which run through tympanic plexus on promontory, leave the middle ear in the lesser petrosal nerve and pass to the otic ganglion
  - motor branch to stylopharyngeus
  - carotid sinus nerve for baro and chemoreceptors
  - pharyngeal branches to pharyngeal plexus
  - tonsillar branch to mucous membrane
  - lingual branch to posterior 1/3 of the tongue

**Vagus nerve**

Superior and inferior ganglion.
Superior ganglion supplies meningeal and auricular branches
Inferior ganglion all the important ones.

Branches are
- meningeal
- auricular
- carotid body branch
- pharyngeal branch to pharyngeal plexus
- superior laryngeal nerve which divides to external and internal laryngeal nerves
- cervical cardiac branches
- recurrent laryngeal nerve
**Accessory nerve**
Spinal and cranial parts. Occupies middle compartment in jugular foramen lateral to vagus. Gives a branch from the cranial part to the vagus which supplies the muscles of the larynx and pharynx. Passes deep to styloid process and posterior belly of digastric. Gives off a branch to sternomastoid. Enters muscle after being passed by sternocleidomastoid branch of the occipital artery. Passes through the muscle to go on to supply the trapezius.

**Hypoglossal nerve**
Emerges from hypoglossal canal and picks up a branch from the anterior ramus of C1. Spirals behind the inferior ganglion of the Vagus to emerge between the internal carotid artery and internal jugular vein. Lies on the carotid sheath deep to styloid muscles and posterior belly of digastric and passes over the arteries and deep to the veins to the tongue. Runs below occipital artery branch of external carotid. C1 fibres supply thyrohyoid and geniohyoid.

**Greater petrosal nerve** – from nervus intermedium part of the facial. Runs obliquely forwards and is joined by deep petrosal nerve. A branch from the carotid plexus of sympathetic nerves. The two form the nerve of the pterygoid canal (vidian nerve) and enter the pterygoid canal in the foramen lacerum and join the pterygopalatine ganglion. Carrying secretomotor fibres (GPN) and sympathetic fibres (DPN)

**Deep petrosal nerve** – from the carotid plexus of sympathetic nerves described above.

**Lesser petrosal nerve** – From glossopharyngeal and funs forwards beneath the fibrous floor of the MCF to emerge through the foramen ovale to join the otic ganglion.