NECK

FASCIA

Brachial Plexus C3-T1
- Roots: Brachial mid scalene
- Passes through costocervical canal (on rib, clavicle, scapula)
- Supraclavicular: from superior trunk → Suprascapular, Infrascapular & 3rd

Cervical Plexus C1-4
- Brachial scalene & middle scalene (deep to SCM)
- Arises cervicals
- Superior Root: C1,2, joins CN XI briefly as it descends then splits away at level C3
- Inferior Root: C2,3
- Both combine to form a second loop to supply Inferior strap muscles (not Thyrohyoid – C1)

Branches of C2-3 loop
- Lesser Occipital: C2 [neck, post scalp]
- Great Auricular: C2,3 [over SCM to parotid, mastoid, auricle]
- Transverse cervical: C2,3 [skin over anterior cervical region]

Branches of C3-4 loop
- Supraclavicular nerve: emerges brachial SCM to supply clavicle and shoulder skin

Phrenic Nerve
- C3,4,5
- Motor, sensory, sympathetic
- Diaphragm, mediastinal pleura, pericardium
- Forms at lateral border of sternocleidomastoideus (sup border of thyroid cart)
- Descends deep to Prevertebral fascia
- Left crosses ant to 1st post Subclavian a | Right crosses ant to 2nd post
- Both desc post to Subclavian vein/ant to internal thoracic artery

Lympathics
- Superficial cervical along EJV → deep cervical

(3) Anterior Cervical Region
Border Structure
Ant Ant border SCM
Post Inf border mandible
Sup Jug notch
Axilla Platysma and subcut tissue
Floor Pharynx, larynx, thyroid

Subdivisions

Submental
- Hyoid/mandible/digastria/mandibular symphysis
- Contains mandible/mandibular symphysis

Submandibular (4)
- Floor Mylohyoid & hypoglossus, middle pharyngeal constrictor
- Submandibular gland: as part of triangle. Submandibular nodes, CN XI and branch of V3

Carotid (6)
- Contains: common carotid (CN IX, X)
- Superior border Omohyoid, border of digastria, and border SCM.

Muscular (7)
- Superior border Omohyoid, border of neck, middle plane of neck
- Inferior strap muscles

By Omohyoid & digastria:

Arteries
- Brachiocephalic branches into r Subclavian & r carotid vs l carotid from Ao arch
- Both bifurcate at level of thyroid cartilage
- Internal carotid has no branches in neck, enters cranium via carotid canal (in petrous temp)

External carotid
- Supplies outside of cranium except scalp and orbits (supraclavicular artery)
- Terminates as mandibular and superficial temporal artery after traversing parotid gland
- 6 main branches arise (1-2-3 = 1 medial, 2 posterior, 3 anterior)

Veins
- Superior petrosal sinus (from cranial via jug foramen and into IJV)
- Facial vein enters near hyoid
- Lingual enters EJV near artery
- Pharyngeal veins at level of mandible
- Thyroid veins (superior/middle)

Nerves
- Transverse cervical (C2-3)
- CN XII
- CN IX
- CN X

Deep Structures of the Neck

Prevertebral Muscle

Anterior Ventral Muscle
Lung Colli
- Contains: mastoid process of temporal bone
- Apex: internal head of sternocleidomastoid
- Base: front of cranium

Ramus Cervicalis Anterior
- Branches to Infrahyoid muscles

Posterior Rami
- Branches to inferior strap muscles

Lateral Vertebral Muscles

Ramus Cervicalis Lateral
- Branches to vertebral arteries

Splenius Cervicalis
- Lateral aspect of mastoid process
- Appears: IJV, Post rami C5-6
- Flex head, stabilize

Leverator Scapulae

Medial rami C2-4 TP
- Sup-Med scapula
- Superior scapular, C3 spinal nerves
- Down rotate scapula
- To Glissow tuber

Middle Scalene
- C3-2 TP
- Sup surface T1 rib
- Post to Subclavian groove
- Anterior to spinal nerve

Posterior Scalenes
- External border C2
- Anti ram C7
- Flex, extend 2nd rib

Post to retrolaryngeal space & medial to cervical brachial plexus and Subclavian a

Ant to occipital condyle

Transdystomy Neck 2012 | Page 2 of 5
ROOT OF NECK

Arteries:
- Brachiocephalic trunk branches post to SCJ on right
- Subclavian on both sides begin at SCJ and reach highest point behind ant scalenes

3 parts based on location to scalenes

<table>
<thead>
<tr>
<th>Part</th>
<th>Location</th>
<th>Branches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medial</td>
<td>Vertebral, Internal Thoracic, Thyrocervical trunk</td>
</tr>
<tr>
<td>2</td>
<td>Posterior</td>
<td>Costocervical trunk</td>
</tr>
<tr>
<td>3</td>
<td>Lateral</td>
<td>Dorsal Scapular</td>
</tr>
</tbody>
</table>

Vertebral Artery
- Cervical (branch of vertebral) ascends between scalenes and longus, passes deep through foramen transversaria of C1-6
- Suboccipital part ascends in groove on post arch C1 through foramen magnum
- Cranial part supplies medulla, cord, cerebellum, dura
- Joints to form basilar artery

Thyrocervical trunk
- Branches from Subclavian near medial border of ant scalenes
- 4 branches
  - Inferior thyroid
  - Asc cervical artery
  - Suprascapular
  - Cervicodorsal trunk

Costocervical trunk
- Branches into sup intercostal and deep cervical

Veins
- EJV (scalp and skin of face) & AJV
- AJV drains into EJV at root
- Suprasternal, AJV combine to form jugular venous arch
- Subclavian vein begins at lateral border 1st rib

NERVES

Vagus
- Exits through jugular foramen & travels post in carotid sheath
- Right: ant to 1st part of SCA/post to brachiocephalic vein and SCJ
- Left: b/w L Common carotid/Subclavian and post to SCJ

Recurrent laryngeal
- Right: loops under R SCA at T4
- Left: loops under Arch Ao at T6/7
- Both asc in tracheo-oesophageal groove

Phrenic
- Descends ant to ant scalene under UV & SCM

Sympathetic Trunk
- Cervical portion: anterolateral to vert column
- No white rami
- Efferent to cervical spinal nerves via grey rami communicantes
- Thoracic viscera via cardiac/sympathetic splanchic nerves
- Head and neck viscera via celiacic arterial branches

NECK

ROOT OF NECK

Arteries:
- Brachiocephalic trunk branches post to SCJ on right
- Subclavian on both sides begin at SCJ and reach highest point behind ant scalenes

3 parts based on location to scalenes

<table>
<thead>
<tr>
<th>Part</th>
<th>Location</th>
<th>Branches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medial</td>
<td>Vertebral, Internal Thoracic, Thyrocervical trunk</td>
</tr>
<tr>
<td>2</td>
<td>Posterior</td>
<td>Costocervical trunk</td>
</tr>
<tr>
<td>3</td>
<td>Lateral</td>
<td>Dorsal Scapular</td>
</tr>
</tbody>
</table>

Vertebral Artery
- Cervical (branch of vertebral) ascends between scalenes and longus, passes deep through foramen transversaria of C1-6
- Suboccipital part ascends in groove on post arch C1 through foramen magnum
- Cranial part supplies medulla, cord, cerebellum, dura
- Joints to form basilar artery

Thyrocervical trunk
- Branches from Subclavian near medial border of ant scalenes
- 4 branches
  - Inferior thyroid
  - Asc cervical artery
  - Suprascapular
  - Cervicodorsal trunk

Costocervical trunk
- Branches into sup intercostal and deep cervical

Axillary a.
- Forms when SC a. passes 1st rib

Veins
- EJV (scalp and skin of face) & AJV
- AJV drains into EJV at root
- Suprasternal, AJV combine to form jugular venous arch
- Subclavian vein begins at lateral border 1st rib
  - IJV (NB EJV joins near insertion to IJV)

NERVES

Vagus
- Exits through Jugular foramen & travels post in carotid sheath
- Right: ant to 1st part of SCA/post to brachiocephalic vein and SCJ
- Left: b/w L Common carotid/Subclavian and post to SCJ

Recurrent Laryngeal
- Right: loops under R SCA at T1-2
- Left: loops under Arch Ao at T4-5
- Both asc in trachea-oesophageal groove

Phrenic
- Descends ant to ant scalene under UV & SCM

Sympathetic Trunk
- Cervical portion: anterolateral to vert column
- No white rami
- Efferent to cervical spinal nerves via grey rami communicantes
- Thoracic viscera via cardiac/sympathetic splanchic nerves
- Head and neck viscera via celiacic arterial branches

Longus capitis
- Anteromedial to longus capitis
- Anterolateral to anterior oblique, transverse cervical
- Posterior to superior cervical rami

Longus colli
- Anteromedial to longus colli
- Anterolateral to posterior oblique, transverse cervical
- Posterior to superior cervical rami

Longus cervicis
- Anteromedial to longus cervicis
- Anterolateral to longus colli
- Posterior to superior cervical rami

Jugular foramen
- Anteromedial to longus capitis
- Posterior to internal carotid

2. RESPIRATORY LAYER

Laryngeal Skeleton
- 9 cartilages: unpaired x3 (thyroid, cercloid, epiglottic) & 3 paired (arytenoid, corniculate, cuneiform)

Thyroid cartilage
- Anterior: Fuse to form thyroid prominence with sup thyroid notch
- Posterior: Opens, greatest horn and lesser horns
  - Sup border (C4)
  - Inf border (C6)

Thyroid notch
- Posterior border of trachea

Cricoid cartilage
- Posterior border of trachea

Innervation
- Superior middle inferior nerves
- From cardiac and superior/inferior thyroid perianterial plexus
- Vasomotor (secretion is hormonally regulated)

Parathyroid
- x2 superior x2 inferior (superior less variable)
- Superior located at inferior border of cricoid cartilage
- Without capsule but within sheath

Vessels
- Inferior thyroid a.
- Parathyroid vein → thyroid plexus
- Lymphatics → Paratracheal or deep cervical nodes

Innervation
- Thyroid branches of cervical sympth ganglia
- Vasomotor not vasosecretory
### Laryngeal Muscles

#### Extrinsic
- Move larynx as a whole
- Include infrahyoid and suprahyoid

#### Intrinsics
- Move individual components
- All supplied by CN X (recurrent laryngeal) except cricothyroid (external laryngeal – from sup laryngeal)

#### Arteries
- Branches of superior & inferior thyroid

#### Veins
- Superior and inferior follow arteries and nerves
- Superior → sup thyroid → UV
- Inferior → venous plexus on trachea → L brachiocephalic trunk

#### Lymphatics
- Superior to vocal folds → sup deep cervical nodes
- Inferior to vocal folds → pre & paratracheal nodes → inferior deep cervical nodes

#### Trachea
- Incomplete tracheal rings (post) with Trachealis muscle overlies incomplete areas
- 2.5cm diameter
- C6 → T4/5

#### 3. Alimentary Layers

#### Pharynx
- Cranial base → inf border of cricoid cartilage & C6
- Widest app hyoid vs Narrowest at inferior end
- Piniform fossa (around larynx) houses internal & recurrent laryngeal nerves

#### Interior
- Nasopharynx: post nose
- Oropharynx: post mouth
- Laryngopharynx: posterior to larynx

#### Tonsils
- Lymphoid aggregates
- Palatine: roof post wall of nasopharynx
- Pharyngeal: post to nasal cavity
- Tubal: sup to entry of pharyngotympanic tube
- Lingual: post tongue
### NECK

**External Layer: Pharyngeal constrictors**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Muscles</th>
<th>Occipital bone</th>
<th>Pharyngeal branch of</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>Pharygohyoid, hyoglossus,</td>
<td></td>
<td>CN X &amp; pleural</td>
<td>Pharyngeal constrictor muscles, stylohyoid, palatopharyngeus</td>
</tr>
<tr>
<td></td>
<td>Post midline of mandible,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lateral tongue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>Pharyngolaryngeal, stylohyoid</td>
<td>Pharyngeal</td>
<td>+ branches of crico-</td>
<td>Levator veli palatini, palatopharyngeal tube, posterior pharyngeal</td>
</tr>
<tr>
<td></td>
<td>muscle</td>
<td>larynx</td>
<td>arytenoid recurrent</td>
<td>constrictor nervous, stylopharyngeal nerve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>larynx</td>
<td></td>
</tr>
<tr>
<td>Inferior</td>
<td>Thyroid and cricoid cartilage</td>
<td>Pharyngo-oesophageal</td>
<td></td>
<td>Recurrent laryngeal nerve, stylopharyngeal muscle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>junction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Internal**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Muscles</th>
<th>Esophagus</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palatopharyngeus</td>
<td>Hard palate &amp; palatine</td>
<td></td>
<td>Palatopharyngeus</td>
</tr>
<tr>
<td>Salpingopharyngeus</td>
<td>Pharyngotympanic tube</td>
<td>Oesophagus</td>
<td>Palatopharyngeus</td>
</tr>
<tr>
<td>Stylopharyngeus</td>
<td>Stylopharyngeus</td>
<td></td>
<td>Palatopharyngeus</td>
</tr>
</tbody>
</table>

**Located on lateral wall of pharynx mostly on middle constrictor**

**Vessels**
- Tonsillar artery (branch of facial) pierces superior constrictor
- External palatine vein → **pharyngial venous plexus**
- Lymphatics → jugulo-gastric nodes

**Nerves**
- Pharyngeal plexus
- Motor: CN X to all but **stylopharyngeus** (CN IX) and **tensor veli palatine** (CN V3)
- Sensory: CN XII

**OESOPHAGUS**
- Cervical oesophagus starts at **C6** – also the narrowest part of oesophagus
- Supplied by inferior thyroid arteries
- Drained by inferior thyroid veins
- Lymphatics → Paratracheal or inf deep cervical nodes
- Innervated by recurrent laryngeal (somatic) and cervical sympathetic trunk (motor)