Neck pins · front

General: bones, cartilages and superficial neck 35

Mandible (neck boundary) B Angle of the mandible inf V External jugular vein lat superf. ★ N Cervical plexus lat deep B Mylohyoid line med B Digastric fossa med B Superior mental spine med B Inferior mental spine med B Mental foramen lat ★ *Mylohyoid line: sublingual fossa superior to it, submandibular fossa inferior to it; mental foramen at the second premolar*

↳ Posterior auricular vein post superf. Retromandibular vein ant ↳ Lesser occipital nerve post superf. Great auricular nerve sup superf. Transverse cervical nerve ant superf. Supraclavicular nerves inf superf.

Mastoid and styloid processes B Mastoid process inf M Sternocleidomastoid lat superf. ★ B Jugular foramen inf B Styloid process inf B Stylohyoid ligament inf *Three styloid muscles, three nerves: stylohyoid (VII), styloglossus (XII), stylopharyngeus (IX); jugular foramen transmits IX, X, XI and the internal jugular vein*

Hyoid bone (stylohyoid ligament to lesser horn) Hyoid bone ★ Body of the hyoid bone ant Greater horn of the hyoid bone lat Lesser horn of the hyoid bone sup *Vertebral levels: hyoid C3, thyroid cartilage C4 to C5, cricoid C6*

Cervical transverse processes, first rib and manubrium (superior to inferior) B Anterior tubercle of the transverse process ant B Carotid tubercle (C6) ant B Scalene tubercle sup B Sternoclavicular joint inf M Sternal head of the sternocleidomastoid med B Jugular notch sup V Anterior jugular vein ant superf. *Carotid tubercle (Chassaignac) on C6: the common carotid can be compressed against it*

↳ Jugular venous arch inf superf.

Platysma, its nerve and the anterior jugular veins M Platysma ant superf. ★ Or Investing layer of the deep cervical fascia superf. *Platysma is a facial-expression muscle: cervical branch of the facial nerve (VII). Deep cervical fascia: investing, pretracheal, prevertebral, carotid sheath*

Sternocleidomastoid and the external jugular vein on it Superficial cervical lymph nodes lat superf. *External jugular vein = posterior auricular + posterior division of the retromandibular vein at the angle of the mandible, crossing SCM superficially; SCM divides the neck into anterior and posterior triangles*

Nerve point of the neck: cutaneous nerves (superior to inferior) Nerve point of the neck post *Erb's point (midpoint of the posterior border of SCM), superior to inferior: lesser occipital (C2), great auricular (C2, C3), transverse cervical (C2, C3), supraclavicular (C3, C4)*

Superior: submental triangle 6

Submental triangle Or Submental triangle med M Anterior belly of the digastric lat superf. ★ M Mylohyoid inf ★ V Submental lymph nodes med superf. A Submental artery inf *Submental triangle: both anterior bellies of the digastric and the body of the hyoid; floor = mylohyoid*

Mylohyoid floor: nerve to mylohyoid and submental artery Geniohyoid sup deep ★ *Suprahyoid nerves 2-2-1: mylohyoid and anterior digastric (V3, nerve to mylohyoid); posterior digastric and stylohyoid (VII); geniohyoid (C1 via XII)*

Superior: submandibular triangle 23

Submandibular triangle: posterior belly of the digastric and stylohyoid Or Submandibular triangle lat A Facial artery med deep V Facial vein lat superf. V Submandibular lymph nodes sup superf. N Hypoglossal nerve lat superf. ★ N Nerve to mylohyoid inf M Posterior belly of the digastric post ★ M Stylohyoid sup ★ M Intermediate tendon of the digastric inf Or Tail of the parotid gland inf N Cervical branch of the facial nerve inf deep *Two bellies, two nerves: anterior digastric V3, posterior digastric VII (with stylohyoid)*

Submandibular gland: facial vein superficial, facial artery deep Or Submandibular gland ★ Or Superficial part of the submandibular gland lat superf. N Marginal mandibular branch of the facial nerve sup superf. *Facial artery grooves the gland deeply, facial vein passes superficial to it; marginal mandibular branch of VII superficial to both*

Lateral surface of the hyoglossus (superior to inferior) M Styloglossus sup Or Deep part of the submandibular gland med deep M Hyoglossus med deep N Lingual nerve sup superf. Or Submandibular duct med M Genioglossus med deep ★ V Lingual vein inf *Superior to inferior on hyoglossus: lingual nerve, submandibular duct, hypoglossal nerve; the lingual nerve double-crosses the duct (lateral, then inferior, then medial); the lingual artery runs deep to hyoglossus*

↳ Submandibular ganglion sup

Sublingual gland on the genioglossus Sublingual gland sup *Parotid is serous, submandibular mixed (mainly serous), sublingual mixed (mainly mucous); the sublingual gland opens by many small ducts on the sublingual fold*

Anterior: carotid triangle 22

Carotid sheath: common carotid artery, vagus nerve, internal jugular vein Or Carotid triangle sup ★ A Common carotid artery med ★ V Internal jugular vein lat deep ★ N Vagus nerve post ★ A Superior thyroid artery sup ★ Or Carotid sheath lat deep ★ N Ansa cervicalis ant superf. ★ V Deep cervical lymph nodes lat deep *I See 10 CCs in the IV (internal jugular vein lateral, vagus (X) posterior between, common and internal carotid medial)*

↳ Carotid bifurcation sup ★ ↳ Carotid bifurcation: Carotid body post ↳ Internal carotid artery lat ★ ↳ Internal carotid: Carotid sinus sup ↳ Common facial vein ant ↳ Cervical cardiac branches of the vagus nerve inf ↳ Superior root of the ansa cervicalis med Inferior root of the ansa cervicalis lat ↳ Jugulodigastric lymph node sup deep Jugulo-omohyoid lymph node inf deep

Carotid bifurcation Carotid sinus branch sup *Bifurcation at the superior border of the thyroid cartilage (C3/C4); carotid sinus senses pressure, carotid body senses chemistry (both IX); the internal carotid has no branches in the neck*

Nerves crossing the internal carotid artery (superior to inferior) Inferior ganglion of the vagus nerve sup *Between internal and external carotids: styloglossus, stylopharyngeus, glossopharyngeal nerve, pharyngeal branch of the vagus; the superior laryngeal nerve passes deep (medial) to both carotids*

↳ Pharyngeal branch of the vagus nerve med Superior laryngeal nerve med deep ★

Anterior: muscular triangle 9

Muscular triangle: sternohyoid and superior belly of the omohyoid Or Anterior triangle of the neck ant ★ Or Muscular triangle med M Sternohyoid med superf. ★ M Superior belly of the omohyoid lat superf. ★ M Sternothyroid inf deep M Thyrohyoid sup deep M Intermediate tendon of the omohyoid inf deep *Anterior triangle splits into 4: submental, submandibular, carotid, muscular. Strap muscles: superficial sternohyoid and omohyoid, deep sternothyroid and thyrohyoid*

Sternothyroid, thyrohyoid and the pretracheal fascia N Nerve to thyrohyoid sup Or Pretracheal layer of the deep cervical fascia ant *Ansa cervicalis (C1 to C3) supplies sternohyoid, sternothyroid, omohyoid; thyrohyoid (and geniohyoid) get C1 via the hypoglossal nerve*

Medial: larynx 47

Thyroid cartilage Or Thyroid cartilage ★ M Cricothyroid ant superf. M Inferior pharyngeal constrictor inf superf. Or Laryngeal prominence ant ★ Or Superior thyroid notch sup Or Lamina of the thyroid cartilage lat M Thyropharyngeal part of the inferior constrictor sup Or Oblique line of the thyroid cartilage lat Or Superior horn of the thyroid cartilage sup N Internal laryngeal nerve sup ★ Or Inferior horn of the thyroid cartilage inf N Recurrent laryngeal nerve med ★ *Thyroid cartilage at C4 to C5; carotid bifurcation at its superior border (C3/C4)*

↳ Right recurrent laryngeal nerve med ★ Left recurrent laryngeal nerve med

Cricoid cartilage and the arytenoids on its lamina Or Cricoid cartilage ★ M Cricopharyngeus inf ★ M Posterior cricoarytenoid post ★ M Lateral cricoarytenoid lat deep Or Arch of the cricoid cartilage ant Or Lamina of the cricoid cartilage post Or Arytenoid cartilage post M Transverse arytenoid post deep M Oblique arytenoid post superf. M Thyroarytenoid lat deep Or Muscular process lat Or Vocal process ant M Vocalis med deep Or Corniculate cartilage sup Or Cuneiform cartilage ant *C6 rule at the cricoid: larynx becomes trachea, pharynx becomes oesophagus. Laryngeal cartilages: 3 unpaired (thyroid, cricoid, epiglottis), 3 paired (arytenoid, corniculate, cuneiform)*

Epiglottis Epiglottis ★ Stalk of the epiglottis inf *Elastic cartilages: epiglottis, corniculate, cuneiform and the apex of the arytenoid; thyroid, cricoid and most of the arytenoid are hyaline and calcify with age*

Thyrohyoid membrane: internal laryngeal nerve and superior laryngeal artery Or Thyrohyoid membrane sup ★ A Superior laryngeal artery inf Or Median thyrohyoid ligament med *Internal laryngeal nerve and superior laryngeal artery pierce the thyrohyoid membrane; sensation superior to the vocal folds = internal laryngeal, inferior = recurrent laryngeal*

Laryngeal vestibule and ventricle Laryngeal vestibule Quadrangular membrane lat Vestibular fold sup Laryngeal ventricle lat *Superior to inferior: vestibular folds (false cords), laryngeal ventricle, vocal folds*

Vocal fold and rima glottidis Vocal fold inf ★ Vocal ligament med Rima glottidis med ★ *Vocal ligament = free superior edge of the conus elasticus; rima glottidis lies between the vocal folds*

Conus elasticus and infraglottic cavity Conus elasticus lat Median cricothyroid ligament ant ★ Infraglottic cavity inf Cricotracheal ligament inf *Median cricothyroid ligament is the emergency airway (cricothyrotomy)*

Cricothyroid and the external laryngeal nerve Cricothyroid joint lat *Cricothyroid is the only intrinsic laryngeal muscle supplied by the external laryngeal nerve (all others: recurrent laryngeal); the nerve runs with the superior thyroid artery*

Cricoarytenoid joint and its muscles Cricoarytenoid joint post *Posterior cricoarytenoid is the only abductor of the vocal folds*

Neck pins · back

Medial: pharynx 59

Nasal cavity: lateral wall (superior to inferior)

Superior nasal concha [lat] Middle nasal concha [lat] Ethmoidal bulla [lat] ⭐ Semilunar hiatus [lat] Inferior nasal concha [lat]

Drainage: sphenoethmoidal recess = sphenoid; superior meatus = posterior ethmoidal; middle meatus (semilunar hiatus) = frontal, maxillary, anterior ethmoidal; inferior meatus = nasolacrimal duct

Nasopharynx: opening of the auditory tube

Or Nasopharynx Or Choanae [ant] Or Pharyngeal opening of the auditory tube [lat] ⭐ M Levator veli palatini [med] Or Torus tubarius [lat] ⭐ M Salpingopharyngeus [lat] Or Salpingopharyngeal fold [lat] Or Pharyngeal recess [post] Or Pharyngeal tonsil [sup]

Pharyngeal tonsil (adenoids) on the roof and posterior wall; salpingopharyngeus runs from the torus tubarius inside the salpingopharyngeal fold

Oropharynx and soft palate Or

Oropharynx Or Oropharyngeal isthmus [ant] M Palatoglossus [ant] Or Soft palate [sup] M Tensor veli palatini [lat] M Palatopharyngeus [post] A Ascending palatine artery [sup] Or Uvula [sup] *All palate muscles are vagus (pharyngeal plexus) except tensor veli palatini (V3)*

Tonsillar bed between the palatine arches

Or Palatoglossal arch [ant] Or Palatine tonsil [lat] ⭐ A Tonsillar branch [lat] M Superior pharyngeal constrictor [sup] [deep] N Glossopharyngeal nerve [ant] ⭐ Or Palatopharyngeal arch [post] *Palatoglossal arch anterior, palatopharyngeal arch posterior; palatoglossus is the only tongue muscle supplied by the vagus*

↳ Branch to stylopharyngeus [post]

Base of the tongue and valleculae Or

Root of the tongue [inf] A External carotid artery [med] ⭐ Or Terminal sulcus [sup] Or Foramen caecum of the tongue [sup] Or Lingual tonsil [ant] Or Median glossoepiglottic fold [med] ⭐ Or Epiglottic vallecula [ant] Or Lateral glossoepiglottic fold [lat] ⭐

Terminal sulcus divides anterior two-thirds from posterior third; posterior third: IX for taste and touch; foramen caecum = origin of the thyroid

↳ Ascending pharyngeal artery [med] [deep] Lingual artery [ant] [deep] Occipital artery [post] Posterior auricular artery [post] Maxillary artery [med] [deep] Superficial temporal artery [sup] [superf.]

Laryngeal inlet and laryngopharynx

Laryngeal inlet [sup] Aryepiglottic fold [lat] ⭐ Laryngopharynx [post] Piriform recess [lat] ⭐ Fold of the superior laryngeal nerve [lat]

Internal laryngeal nerve runs in the mucosa of the piriform recess (fish bones lodge there)

Superior and middle constrictors Or

Pharyngobasilar fascia [sup] M Pterygomandibular raphe [ant] M Stylopharyngeus [lat] Or Pharyngeal raphe [post] M Middle pharyngeal constrictor [inf] N Pharyngeal plexus [lat] Or Retropharyngeal space [post] M Longus colli [med] [deep] M Longus capitis [lat] [deep] *All pharyngeal muscles are vagus (pharyngeal plexus) except stylopharyngeus (IX); stylopharyngeus and IX enter between the superior and middle constrictors*

Inferior constrictor and the Killian dehiscence

Inferior pharyngeal dehiscence (Killian) [post] Pharyngo-oesophageal junction [inf]

Killian's dehiscence between thyropharyngeus and cricopharyngeus: site of the Zenker diverticulum

Medial: thyroid and parathyroid glands 15

Thyroid gland: lobes and isthmus Or

Thyroid gland ⭐ A Inferior thyroid artery [post] [deep] ⭐ Or Lobes of the thyroid gland [lat] V Middle thyroid vein [lat] Or Isthmus of the thyroid gland [ant] V Inferior thyroid veins [ant] A Thyroid ima artery [inf] Or Pyramidal lobe of the thyroid gland [sup] ⭐ Or Suspensory ligament of the thyroid gland [med] [deep] *Isthmus lies on tracheal rings 2 to 4; pyramidal lobe = thyroglossal duct remnant*

Superior pole: superior thyroid vessels

Or Superior pole of the thyroid gland [sup] V Superior thyroid vein [sup] N External laryngeal nerve [med] [deep] ⭐ *Superior thyroid artery: first branch of the external carotid, with the external laryngeal nerve; ligate it close to the gland*

Posterior border of the lobe: parathyroid glands and middle thyroid vein

Superior parathyroid gland [post] ⭐ Inferior parathyroid gland [post] ⭐ *Inferior parathyroids come from the 3rd pouch (with the thymus) and migrate further; superior from the 4th. Superior and middle thyroid veins to the internal jugular, inferior to the brachiocephalic*

Inferior pole: inferior thyroid vessels

Inferior pole of the thyroid gland [inf] *Inferior thyroid artery from the thyrocervical trunk, close to the recurrent laryngeal nerve: ligate it away from the gland; thyroid ima artery (about 10%) from the brachiocephalic trunk or arch*

Medial: cervical trachea and oesophagus 14

Tracheo-oesophageal groove and the recurrent laryngeal nerves

Or Cervical part of the trachea [ant] A Brachiocephalic trunk [med] ⭐ Or Tracheal cartilages [ant] Or Tracheo-oesophageal groove [lat] Or Cervical part of the oesophagus [post] V Venous angle [post] *Right recurrent laryngeal hooks the right subclavian, left hooks the aortic arch (posterior to the ligamentum arteriosum); both ascend in the tracheo-oesophageal groove*

↳ Subclavian artery [lat] ⭐

↳ Subclavian: First part of the subclavian artery [med]

↳ First part of the subclavian:

Vertebral artery [sup] ⭐ Internal thoracic artery [inf] ⭐ ↳ Jugular lymphatic trunk [sup] Subclavian lymphatic trunk [lat] Thoracic duct (cervical part) [post] Right lymphatic duct [med]

Lateral: posterior triangle 26

Occipital triangle: accessory nerve on the levator scapulae

Or Posterior triangle of the neck [lat] ⭐ M Descending part of trapezius [post] [superf.] N Accessory nerve [sup] [superf.] ⭐ M Inferior belly of the omohyoid [inf] ⭐ N Roots of the brachial plexus [med] A Transverse cervical artery [sup] Or Occipital triangle [sup] M Levator scapulae [post] [deep] M Scalenus medius [post] [deep]

Accessory nerve lies superficially on levator scapulae: enters at the junction of the superior and middle thirds of the posterior border of SCM, reaches trapezius at the junction of its middle and inferior thirds

↳ Superior trunk [sup]

↳ Superior trunk: Suprascapular nerve [lat]

↳ Middle trunk [lat] Inferior trunk [inf] Divisions of the brachial plexus [inf]

Scalenus medius: dorsal scapular and long thoracic nerves

N Dorsal scapular nerve [post] A Dorsal scapular artery [post] N Long thoracic nerve [post] ⭐ M Scalenus posterior [post] [deep]

C5, 6, 7 - wings of heaven (long thoracic nerve, winged scapula); dorsal scapular (C5) and long thoracic pierce scalenus medius

Omoclavicular triangle Or

Omoclavicular triangle [inf] A Third part of the subclavian artery [lat] V Subclavian vein [ant] ⭐ A Thyrocervical trunk [med] ⭐ V Supraclavicular lymph nodes [inf] V Transverse cervical vein [sup] V Suprascapular vein [inf] *Inferior belly of the omohyoid divides the posterior triangle into occipital (superior) and omoclavicular (inferior) triangles*

↳ Suprascapular artery [ant]

Inferior and posterior: root of the neck, prevertebral region, sympathetic trunk 16

First part of the subclavian artery: vertebral and internal thoracic branches

Vertebral vein [ant] *VIT C and D (vertebral, internal thoracic, thyrocervical trunk, costocervical trunk, dorsal scapular); first part medial to scalenus anterior gives the first three*

Thyrocervical trunk at the medial border of scalenus anterior

Ascending cervical artery [med] *Thyrocervical trunk: inferior thyroid (gives ascending cervical), transverse cervical, suprascapular; SIT on the thyrocervical trunk (suprascapular, inferior thyroid, transverse cervical)*

Scalenus anterior: phrenic nerve and the scalene interval

Or Scalene interval [post] M Scalenus anterior [ant] ⭐ A Second part of the subclavian artery [post] *C3, 4, 5 keeps the diaphragm alive: phrenic descends on the anterior surface of scalenus anterior. Subclavian vein anterior to scalenus anterior, subclavian artery and plexus posterior to it (scalene interval); artery parts 1, 2, 3 = medial, posterior, lateral to the muscle*

↳ Costocervical trunk [post]

Venous angle: veins and lymphatic ducts

Or Lesser supraclavicular fossa [ant] [superf.] M Clavicular head of the sternocleidomastoid [lat]

Thoracic duct ends at the left venous angle (internal jugular + subclavian); right lymphatic duct drains only the right upper quadrant

Prevertebral fascia and muscles Or

Prevertebral layer of the deep cervical fascia [post] [deep] N Phrenic nerve [ant] [deep] ⭐ N Cervical sympathetic trunk [ant]

Deep cervical fascia: investing, pretracheal, prevertebral, carotid sheath; the danger space (anterior to the prevertebral layer) runs from skull base to diaphragm

↳ Superior cervical ganglion [sup] ⭐ Middle cervical ganglion [ant] Ansa subclavia [ant] Cervicothoracic ganglion [inf] ⭐ Cervical cardiac nerves (sympathetic) [inf]