



Endocrinology Module Root of Neck (SGD)





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Motto Vision ;The Dream/Tomorrow



- To impart evidence based research oriented medical education
- To provide best possible patient care
- To inculcate the values of mutual respect and ethical practice of medicine

Prof. Umar's Model of Teaching Strategy Self Directed Learning Assessment Program

Objectives : To cultivate critical thinking, analytical reasoning, and problem-solving competencies.

To instill a culture of self-directed learning, fostering lifelong learning habits and autonomy.

How to Assess?

➤Ten randomly selected students will be evaluated within the first 10 minutes of the lecture through 10 multiple-choice questions (MCQs) based on the PowerPoint presentation shared on Students Official WhatsApp group, one day before the teaching session.

➤ The number of MCQs from the components of the lecture will follow the guidelines outlined in the Prof. Umar model of Integrated Lecture.

Component	Core	Horizontal	Vertical	Spiral
of LGIS	Knowledge	Integration	Integration	Integration
No. of MCQs	6-7	1-2	1	1



Professor Umar Model of Integrated Lecture



Learning objectives

- Discuss arteries and veins in root of neck
- Discuss the nerves in root of neck.
- Discuss the paravertebral muscles with special emphasis on scalenous anterior
- Describe Submandibular gland and its relation to hyoglossus muscle
- Related Physiology and Biochemistry (Horizontal Integration)
- Related clinical/congenital abnormalities (Vertical integration)
- Professionalism/ Communication Skills
- Bioethics
- Research article related to topic
- HEC Digital Library
- Learning Resources

INTERACTIVE SESSION

Kite String or Manja Cut Injury: A New Culprit



Root of neck

- At thoracic inlet
- Formed by
 - Anteriorly manubrium sterni
 - Posteriorly body of first thoracic vertebra
 - Laterally first rib and costal cartilage
 - Central markers scalenus anterior



Arteries in root of neck

• 1. Brachiocephalic trunk : Thyroida ima artery





- 2. Subclavian arteries :
- <u>**1 part</u>**: Vetebral , Internal thoracic & thyrocervical trunk (inf. Thyroid / Ascending cervical , Transverse cervical & suprascapular)</u>
- <u>2 part</u>: Costocervical trunk (Superior intercostal & deep cervical arteries)
- <u>**3 part</u>**: Dorsal scapular artery</u>



BRANCHES OF THE SUBCLAVIAN ARTERY





Relations of first part of Subclavian Artery

- <u>Anterior</u>
- 1. Common carotid artery
- 2. Vagus
- 3. IJV
- 4.Sternthyroid & Sternohyoid
- 5.Sternocleidomastoid
- <u>Posterior</u>
- 1. Apex of lung
- 2. Suprapleural membrane
- 3. Cervical pleura





Relations of second part of Subclavian

<u>Artery</u>

• Anterior

- 1. Scalenus anterior
- 2. Phrenic nerve deep to prevertebral fascia
- 3.Sternocleidomastoid
- <u>Posterior</u>
- 1. Apex of lung
- 2. Suprapleural membrane
- 3. Cervical pleura
- <u>Superior</u>
- 1. Upper & middle trunks of brachial plexus

Relations of third part of Subclavian

<u>Artery</u>

<u>Anterior</u>

- 1. Middle one third of clavicle
- 2. Post border of sternocleidomastoid
- Posterior
- 1. Apex of lung
- 2. Suprapleural membrane
- 3. Cervical pleura
- 4. Lower trunk of brachial plexus
- 5. Scalenus medius
- <u>Superior</u>
- 1. Upper & middle trunks of brachial plexus
- Inferior
- 1. First rib

3. Common carotid arteries



Veins and lymphatics in root of neck

- 1. AJV
- 2. IJV
- 3. EJV
- 4. Subclavian vein
- 5. Inferior thyroid veins
- 6. Thoracic duct & right lymphatic duct





Superior And Inferior Bulb



Tributaries



Central Lines	\int
What is ?	Ç.
Cotheter inserted into large vein close to ♡ (SVC/IVC)	\rightarrow
-Single lumen vs multiple lumens Insertion Sites - Different purposes	
1) Internal Jugular (IJ) *Most common - Quick i easy access	
2)Subclavian (SC) -More difficult to place Terminates in SVC -Trade offs wirisks (good us bad)	
3) Femoral * Least preferred Emergency (D24hrs) Terminates in IVC - Trade offs whicks	



Nerves in the root of neck

- <u>1. Vagus nerve</u>:
- Right & left recurrent laryngeal nerves
- <u>2. Phrenic nerve :</u>
- <u>3.Sympathetic trunks :</u>
- Stellate ganglion / Cervicothoracic ganglion (inferior cervical ganglion & first thoracic ganglion)





Vagus /Wanderer Nerve





Fig. 24.1: Attachment of cranial nerves to the base of brain



Figs 24.5a to c: (a) Nucleus of facial nerve, (b) nucleus ambiguus, and (c) nucleus of hypoglossal nerve



Fig. 3.3: Transverse section through the neck at the level of the seventh cervical vertebra



Branches in the neck

- Pharyngeal branches Provides motor innervation to the majority of the muscles of the pharynx and soft palate.
- Superior laryngeal nerve Splits into internal and external branches. The external laryngeal nerve innervates the cricothyroid muscle of the larynx. The internal laryngeal provides sensory innervation to the laryngopharynx and superior part of the larynx.
- **Right recurrent laryngeal nerve** –innervates the majority of the intrinsic muscles of the larynx.

Thorax

In the thorax, the right vagus nerve forms the **posterior vagal trunk**, and the left forms the **anterior vagal trunk**. Branches from the vagal trunks contribute to the formation of the oesophageal plexus, which innervates the smooth muscle of the oesophagus.

Two other branches arise in the thorax:

- Left recurrent laryngeal nerve hooks under the arch of the aorta, ascending to innervate the majority of the intrinsic muscles of the larynx.
- Cardiac branches regulate heart rate and provide visceral sensation to the heart

<u>In Abdomen</u>

Vagal trunks **terminate** by dividing into branches that supply:

- ✓ Oesophagus
- ✓ Stomach
- ✓ Small and large bowel (up to the splenic flexure).



Phrenic Nerve



Phrenic Nerve



Core Knowledge



PARAVERTEBRAL MUSCLES

- 1. Scalene anterior
- 2. Scalene medius
- 3. Scalene posterior



TABLE 8.4. PREVERTEBRAL MUSCLES

Muscle	Superior Attachment	Inferior Attachment	Innervation	Main Action(s)
Anterior vertebral muscles				
Longus colli	Anterior tubercle of C1 vertebra (atlas); bodies of C1–C3 and transverse processes of C3–C6 vertebrae	Bodies of C5–T3 vertebrae; transverse processes of C3–C5 vertebrae	Anterior rami of C2–C6 spinal nerves	Flexes neck with rotation (torsion) to opposite side if acting unilaterally ^a
Longus capitis	Basilar part of occipital bone	Anterior tubercles of C3–C6 transverse processes	Anterior rami of C1–C3 spinal nerves	
Rectus capitis anterior	Base of cranium, just ante- rior to occipital condyle	Anterior surface of lateral mass of atlas (C1 vertebra)	Branches from loop between C1 and C2 spinal nerves	Flex head ^b
Anterior scalene	Transverse processes of C3–C6 vertebrae	1st rib	Cervical spinal nerves C4–C6	

Muscle	Superior Attachment	Inferior Attachment	Innervation	Main Action(s)
Lateral vertebral muscles				
Rectus capitis lateralis	Jugular process of occipital bone	Transverse process of atlas (C1 vertebra)	Branches from loop between C1 and C2 spinal nerves	Flexes head and helps stabilize it ^b
Splenius capitis	Inferior half of nuchal ligament and spinous processes of superior six thoracic vertebrae	Lateral aspect of mastoid process and lateral third of superior nuchal line	Posterior rami of middle cervical spinal nerves	Laterally flexes and rotates head and neck to same side; acting bilaterally, extends head and neck ^c
Levator scapulae	Posterior tubercles of transverse processes C2–C6 vertebrae	Superior part of medial border of scapula	Dorsal scapular nerve C5 and cervical spinal nerves C3 and C4	Downward rotation of scapula and tilts its glenoid cavity inferiorly by rotating scapula
Middle scalene	Posterior tubercles of transverse processes of C5–C7 vertebrae	Superior surface of 1st rib; posterior to groove for sub- clavian artery	Anterior rami of cervical spinal nerves	Flexes neck laterally; elevates 1st rib during forced inspiration ^a
Posterior scalene		External border of 2nd rib	Anterior rami of cervical spinal nerves C7 and C8	Flexes neck laterally; elevates 2nd rib during forced inspiration ^a

TABLE 8.4. PREVERTEBRAL MUSCLES (Continued)

^aFlexion of neck = anterior (or lateral) bending of cervical vertebrae C2–C7.

^bFlexion of head = anterior (or lateral) bending of the head relative to the vertebral column at the atlanto-occipital joints.

^cRotation of the head occurs at the atlanto-axial joints.

Scalenus Anterior

- 'Key muscle' at the root of the neck.
- Most superficial and lies deep to Sternocleidomastoid muscle.
- It is a useful 'surgical landmark'.
 ORIGIN-
- Anterior tubercles of the transverse processes of all typical cervical (C3- C6) vertebrae.

INSERTION-

- Scalene tubercle on inner border of the 1st rib.
- Ridge on the upper surface of 1st rib separating the groove for subclavian artery posteriorly and groove for subclavian vein anteriorly.



Scalenus Anterior contd...

NERVE SUPPLY-

 Anterior primary rami of C4, C5, and C6 spinal nerves.

ACTIONS-

- Flexion of cervical part of vertebral column.
- Elevates the 1st rib-accessory muscle of respiration.



Relations of Scalenus Anterior

ANTERIOR-

One nerve-

1. Phrenic Nerve.

Two arteries-

- 1. Suprascapular artery.
- 2. Transverse cervical artery.

Two veins-

- 1. Anterior jugular vein.
- 2. Subclavian vein.

Two muscles-

- 1. Inferior belly of omohyoid.
- 2. Clavicular head of Sternocleidomastoid

Carotid sheath.

Clavicle bone.



Relations of Scalenus Anterior contd...

POSTERIOR-

- Roots of brachial plexus.
- 2nd part of Subclavian artery.
- Scalenus medius muscle.
- Cervical pleura.
- Suprapleural membrane.





Scalenus Medius

ORIGIN-

 Posterior tubercles and costo-transverse bars of the transverse processes of C2- C6 vertebrae.

INSERTION-

 Upper surface of the 1st rib, between the tubercle of the rib and groove for subclavian artery.

NERVE SUPPLY-

Anterior primary rami of C3-C8 spinal nerves.

ACTIONS-

- Bends the cervical vertebral column to the same side (when the 1st rib is fixed).
- Elevates the 1st rib (when upper attachment is fixed)accessory muscle of respiration.



Scalenus Posterior

- Smallest and most deeply situated muscle in this group.
 ORIGIN-
- Posterior tubercles of the transverse processes of C4, C5, and C6 vertebrae.

INSERTION-

 Outer surface of the 2nd rib, behind the tubercle for Serratus anterior.

NERVE SUPPLY-

 Anterior primary rami of lower three cervical (C6, C7, and C8) spinal nerves.

ACTIONS-

- Bends the cervical vertebral column to the same side (when the 2nd rib is fixed).
- Elevates the 2nd rib (when upper attachment is fixed).



Scalenus minimus



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Scalene Triangle

LOCATION-

• Above the first rib between Scalenus anterior and Scalenus medius muscle.

CONTENTS-

- Trunks of brachial plexus.
- Subclavian artery.



Scalenovertebral Triangle OR Triangle of Vertebral Artery

· A deeply placed triangular space at the root of the neck.

BOUNDARIES-

Medial-Inferior oblique part of Longus colli.

Lateral-Medial border of Scalenus anterior.

Apex-

Transverse process of C6 vertebra.

Base-

1st part of subclavian artery.



Boundaries of Scalenovertebral Triangle contd...

Floor-

- 1. Transverse process of C7 vertebra.
- 2. Ventral ramus of C8 spinal nerve.
- 3. Neck of 1st rib.
- 4. Cupola of cervical pleura.

Roof-

Carotid sheath



SCALENOVERTEBRAL TRIANGLE CONTD...

CONTENTS-

- 1st part of vertebral artery.
- Thyrocervical trunk.
- Inferior thyroid artery.
- Sympathetic chain with stellate ganglion.
- Ansa subclavia.



Vertical Integration

HORNER'S SYNDROME

Y	AND
	inter a second sec
S	Sympathetic Nerve Fiber Injury
Α	Anhidrosis
М	Miosis
Ρ	Ptosis
L	Loss of ciliospinal reflex
Е	Enophthalmos

Vertical Integration



Spiral Integration

Family Medicine CERVICAL RADICULOPATHY

DEFINITION & SYMPTOMS

0

Radiculopathy when one or more nerves are affected at the level of the nerve root (radix = "root") resulting in pain (radicular pain), weakness, & numbriess. Cause can be disc herniation, spondylosis or osteophytosis.



Increased prevalence 40-49 years of age.

DIAGNOSIS



- 8 Fositive Spuring's test
- Fositive distraction test
- E Cervical rotation + 82 degs
- Fositive Upper Limb Tension Test

WAINNER ET AL 2003

BOYLES ET AL 208

NATURAL HISTORY OF CERVICAL RADICULOPATHY



Substantial improvement 4 - 6 months

Time to complete recovery can be 24 - 36 months



Neurological deficit: full recovery in majority of cases with no myelopathy works et al. 2014 EXERCISE & MANUAL THERAPY MORE EFFECTIVE THAN 'WAIT & SEE'



SURGERY V PHYSIOTHERAPY: MINIMAL DIFFERENCE LONG TERM



Surgery confers greater reductions in pain in short term



ENOQUIST ET AL 2013

H1 Boyles at al 36 Manual & Maripalither Therapy 2011 19: 5 (Hanney et al Spice 2003)812-42 (World H & Spice M 2014) 81(16) -1789 / Thomsen Chicopercht & Manual Therapies 2016 2445 / English et al Spice 2013 3829 1775-1722

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Communication Skills/ Professionalism

Breaking bad news

Setting up and starting. Mentally rehearse and arrange for privacy.

Perception. Elicit the patient's perspective.

nvitation. Ask the patient what they would like to know.

Knowledge. Provide information in small pieces.

motions. Recognize and empathize with the patient's emotions.

Strategy and summary. Set out a medical plan of action.

Spiral Integration



Framework^a

Principle	Description
Respect for Autonomy	Respect for the individual patient and his or her ability to make decisions with regard to own health and future; right to self-determination
Beneficence	Doing and promoting good; preventing and removing evil or harm
Nonmaleficence	Doing no harm; avoiding harming
Justice	Maximizing benefit to patients and society while emphasizing equality, fairness, and impartiality

^a Adapted from Beauchamp and Childress.³

Research Article

Stellate ganglion block for non-pain indications

https://doi.org/10.1093/pm/pnad011

Abstract

Introduction

Stellate ganglion block (SGB) is performed to relieve head, face, neck, or upper limb pain, and several non-pain indications for performing this block have emerged over the years. To date, there has been no attempt to synthesize evidence on SGB for treating non-pain indications

Conclusions

SGB can be considered for obtunding cardiovascular sympathetic stimulation and stress response, reducing vascular tone to improve vascular insufficiency in the limbs and perioperative hemodynamic stability, and alleviating hot flashes in menopause, in conditions refractory to conventional medical management.

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Video

