HEAD AND NECK BLOCK 2 EXAM

1 - WRITTEN EXAM
18 Questions 4.90% of grade

2 - PRACTICAL EXAM
15 Questions Gross Anatomy
2.72% of grade

1) Prosections – already in lab; some correspond to photos; some structures not labeled
2) X-rays, Angiograms

NO SKULL SESSIONS: no questions on skulls

ATLAS HOLDING UP WORLD
ADVICE ON HOW TO TAKE THE HEAD AND NECK EXAM

DRAW:

1. CRANIAL NERVE FUNCTIONAL COMPONENTS

CHART

3. SVE MUSCLES - 'incantation'

4. BRANCHIAL ARCHES, POUCHES

5. GVE PARASYMPATHETICS - HITCHHIKING PATHWAYS - BRANCHES IX (VIDEO REVIEW)

[6. BRANCHES OF MAXILLARY ARTERY]
REVIEW

1. LARYNX
2. NECK - Compartments, Carotid Artery
3. PHARYNX - TONSILS, POPCORN
4. ORAL CAVITY
LARYNX REVIEW: CARTILAGES

THYROID CARTILAGE
- shield shaped
- has Sup. and Inf. Horns
- Laryngeal prominence

ARYTENOID - 2 pyramidal shaped cartilages above lamina of cricoid

CRICOID = signet ring
- complete ring of cartilage
- narrow Arch ant., broad Lamina post.
LARYNX REVIEW: SYNOVIAL JOINTS

THYROID and CRICOID

ARYTENOID and CRICOID

JOINTS PERMIT TILTING OF THYROID-CRICOID

Hinge Joint

ROTATION

SLIDING

SYNOVIAL JOINT BETWEEN ARYTENOID AND CRICOID

JOINTS PERMIT ROTATION AND SLIDING
SOUND PRODUCTION: CONUS ELASTICUS

CONUS ELASTICUS

INTERNAL ELASTIC MEMBRANE ATTACHED TO CRIOCID; UPPER FREE EDGES = VOCAL LIGAMENTS

VOCAL LIGAMENTS EXTEND FROM ARYTENOID TO THYROID, ACROSS TWO JOINTS

RIMA GLOTTIDIS = opening
CHANGE PITCH BY TILTING AT HINGE JOINT – Thyroid cartilage tilts down; cricoid tilts up

Tilting - STRETCHES vocal ligaments

RELAX vocal ligament
DECREASE PITCH - THYROARYTENOID

STRETCH vocal ligament
INCREASE PITCH - CRICOTHYROID
CRICOTHYROID M. -
Tenses
Vocal Ligament
Increasing Pitch

STRETCH vocal ligament
INCREASE PITCH -
CRICOTHYROID

MUSCLES OF LARYNX

Tilting - STRETCHES vocal ligaments

HINGE JOINT
THYROARYTENOID MUSCLES - adjacent to vocal ligament - Relaxes Vocal Ligaments Decreases pitch

THYROID

CRICOID

HINGE JOINT

RELAX vocal ligament
DECREASE PITCH - THYROARYTENOID
OPEN AND CLOSE RIMA GLOTTIDIS BY ROTATING/SLIDING ARYTENOID -

Rotate laterally opens; Rotate medially or slide closes

REST POSITION

OPEN

POSTERIOR CRICOARYTENOID

CLOSE

LATERAL CRICOARYTENOID

CLOSE

SLIDE

ARYT ENOIDEUS
Arytenoids can rotate/slide. Adduct closes rima glottidis. Abduct opens rima glottidis.

5) ARYTENOID (Transverse and oblique arytenoid) - Adduct vocal folds

4) LATERAL CRICO-ARYTENOID - Adduct vocal folds

3) POSTERIOR CRICO-ARYTENOID – Abducts vocal fold

MUSCLES OF LARYNX
LARYNX: POSTERIOR VIEW

GHHB - GREATER HORN OF HYOID BONE
EG - EPIGLOTTIS
PWP - POSTERIOR WALL OF PHARYNX
AM - ARYTENOID MUSCLE
PCAM - POSTERIOR CRICOARYTENOID MUSCLE
CCA - CRICOID CARTILAGE
CCA - COMMON CAROTID ARTERY
TG - THYROID GLAND
T - TRACHEA
VN - VAGUS NERVE
E* - ESOPHAGUS (REFLECTED)
IV. TERMS ASSOCIATED WITH LARYNX

Bisect Larynx to see interior structures
VESTIBULE - inlet above false vocal folds

VESTIBULAR (FALSE VOCAL) FOLDS - overlie vestibular ligaments

VENTRICLE - area between true and false vocal folds; lateral extension is Laryngeal Sinus

VOCAL (TRUE VOCAL) FOLDS - overlie vocal ligaments

Clinical - Anaphylactic shock - mucosa tightly attached at vocal folds; swelling of vestibular folds blocks airway
VESTIBULE - inlet above false vocal folds

VESTIBULAR (FALSE VOCAL) FOLDS - overlie vestibular ligaments (lower edge of Quadrangular membrane)

VOCAL (TRUE VOCAL) FOLDS - overlie vocal ligaments (upper edge of Conus elasticus)
1) Superior Laryngeal N.
   a) Internal Laryngeal N.
      GVA Sensory to Larynx Above (true vocal folds)
   b) External Laryngeal N.
      SVE Motor to Cricothyroid

2) Recurrent Laryngeal n.
   - GVA Sensory to Larynx True Vocal Folds
   - SVE motor to all other Muscles of Larynx

Clinical - damage to Recurrent Laryngeal nerve in Thyroid surgery
NERVES OF LARYNX – Branches of Vagus

SUPERIOR LARYNGEAL NERVE - pierces thyrohyoid membrane

RIGHT RECURRENT LARYNGEAL NERVE - passes under Subclavian Artery

LEFT RECURRENT LARYNGEAL NERVE - passes under Arch of Aorta
Deep Cervical fascia
- one layer surrounds neck, other layers form tubes (names poorly chosen)

1. Investing layer
2. Prevertebral Layer
3. Pre-tracheal layer
4. Carotid sheath
Prevertebral Layer - surrounds vert. column & muscles back of neck, prevertebral, lateral vertebral and suboccipital m.

Pretracheal Layer - surrounds trachea, esophag. & thyroid continues to mediastinum

Carotid Sheath - surrounds common & int carotid, int jugular and X (not: Symp. Chain)

Retropharyngeal Space - between PreTrach & Pre Vert layers - infection from head (tonsillitis) can spread to mediastinum

FASCIA OF NECK
Pretracheal layer

Carotid Sheath

Prevertebral layer

Retropharyngeal Space

Carotid sheath is anterior to vertebrae
A. MUSCLES OF NECK - NOT ATTACHED TO HYOID - move head & neck

1. STERNO-CLEIDOMASTOID

- Two heads
  - 1) manubrium of sternum
  - 2) clavicle - medial 1/3

- Mastoid process of temporal bone

- Act: bilateral - flex head; unilateral rotate head, face to directed opposite side

- Inn: CN XI Accessory n.

MOST IMPORTANT LANDMARK IN NECK

PULL MASTOID TOWARD STERNUM

TORTICOLLIS – Contracture of Sternocleidomastoid
Sternocleidomastoid muscle - divides neck into anterior & posterior triangles

**Posterior triangle -**
- Prevertebral layer; Brachial plexus, cervical plexus (Phrenic nerve);
- Subclavian artery

**Anterior triangle -**
- Pretracheal layer; Contents of Lateral compartment: Carotid sheath
MUSCLES OF NECK - NOT ATTACHED TO HYOID

2. SCALENUS ANTERIOR AND SCALENUS MEDIUS

- **O**: vertebrae-trans processes upper cervical
- **I**: rib 1
- **A**: flex neck & elevate rib 1
- **Inn**: ventral rami of cervical spinal nerves

SECOND MOST IMPORTANT LANDMARKS IN NECK
Posterior triangle -
Preveretebral layer;
Brachial plexus, cervical plexus (Phrenic nerve);
Subclavian artery

Anterior triangle -
Pretracheal layer;
Contents of Lateral compartment:
Carotid sheath

Posterior triangle -
Preveretebral layer;
Brachial plexus, cervical plexus (Phrenic nerve);
Subclavian artery
1. COMMON CAROTID
2. INTERNAL CAROTID
3. ASCENDING PHARYNGEAL
4. OCCIPITAL
5. SUPERFICIAL TEMPORAL
6. MIDDLE CEREBRAL
7. ANTERIOR CEREBRAL
8. MIDDLE MENINGEAL
9. MAXILLARY
10. FACIAL
11. LINGUAL
12. EXTERNAL CAROTID
13. SUPERIOR THYROID

*- OPHTHALMIC ARTERY ARISING FROM CAROTID SIPHON
PHARYNX - is continuous with esophagus, opens to larynx and trachea.
PHARYNX

All Pharynx is GVA
In 3 Cranial Nerves

NASOPHARYNX - VII
Oropharynx - IX
Laryngopharynx - X

Nasal Cavity GSA
Oral Cavity GSA

soft palate
epiglottis
Tell Constrictors Apart by level

SUP. CONST.
O - Pterygomandibular Raphe
(Conn. Tiss. Lig. from Med. Pterygoid plate to Mandible - CONTINUOUS ANT. WITH BUCCINATOR)

MID. CONST.
O - HYOID

INF. CONST.
O - THYROID & CRICOID Cartilage
Structures Through Gaps In Constrictors

1) Between Sup. Constrictor and Skull
   Levator Veli Palatini M.
   Auditory Tube

2) Between Sup. and Mid. Constrictor
   Glossopharyngeal N. (IX)
   Stylopharyngeus M.

3) Between Mid. and Inf. Constrictor
   Superior Laryngeal A.
   Internal Laryngeal N.
POSTERIOR PHARYNX AND RETROPHARYNGEAL SPACE

HYPOGLOSSAL NERVE (XII)
ACCESSORY NERVE (XI)
VAGUS NERVE (X)
SUPERIOR CERVICAL GANGLION
SUPERIOR PHARYNGEAL CONSTRICCTOR M.
GLOSSOPHARYNGEAL NERVE (IX)
STYLOPHARYNGEUS M.
INTERNAL CAROTID ARTERY
HYOID BONE
SYMPATHETIC TRUNK
RETROPHARYNGEAL SPACE

PROSECTION BY AMY BAIR, JCESOM SURGICAL ANATOMY COURSE 2009
POSTERIOR PHARYNX AND CRANIAL NERVES IX, X, XI AND XII

SPM - STYLO-PHARYNGEUS MUSCLE
IX - GLOSSO-PHARYNGEAL N.
SCM - SUPERIOR PHARYNGEAL CONSTRICCTOR M.
MCM - MIDDLE PHARYNGEAL CONSTRICCTOR M.
HB - HYOID BONE
ICM - INFERIOR PHARYNGEAL CONSTRICCTOR M.

SCG - SUPERIOR CERVICAL GANGLION
X - VAGUS NERVE
XII - HYPOGLOSSAL NERVE
XI - ACCESSORY NERVE
SCMM - STERNOCLEIDOMASTOID MUSCLE
CCA - COMMON CAROTID ARTERY
SLN - SUPERIOR LARYNGEAL NERVE
Carotid sheath is anterior to vertebrae
CONTENTS OF PHARYNX

in Nasopharynx
- Pharyngeal Tonsil (Adenoids)
- opening of Auditory Tube

in Oropharynx
- Palatine Tonsils (Tonsillitis)
posterior to Palatoglossal Arch
PALATINE TONSILS - LOCATION

PALATO-GLOSSAL ARCH

PALATO-PHARYNGEAL ARCH

PALATINE TONSIL

AAH!
PALATINE TONSILS - Tonsillectomy - incise mucosa

Tonsillar ‘Bed’ - Formed by
1) Superior Constrictor of pharynx and
2) Styloglossus

Clinical -
1) Damage IX
2) Bleeding
A child complains that he has popcorn stuck in his throat. Examination shows that it is lodged in the laryngopharynx, lateral to the inlet of the larynx. The popcorn is in the _________.

CLINICAL VIGNETTE

PHARYNX - INTERNAL STRUCTURES

PIRIFORM RECESS: lateral to inlet of larynx

Inlet of Larynx
PHARYNX - INTERNAL STRUCTURES

VALLECEULAE - in Oropharynx
A. SUPERFICIAL STRUCTURES

1. SULCUS TERMINALIS - V-SHAPE GROOVE DIVIDES TONGUE INTO: ANT. 2/3- ORAL PART - GSA; POST 1/3 - PHARYNGEAL PART - GVA

2. FORAMEN CAECUM - PIT IN MIDDLE OF SULCUS TERMINALIS- SITE OF INVAGINATION OF THYROID GLAND

CLINICAL QUESTION: MASS IN POSTERIOR TONGUE; CHECK IF IT IS THYROID TISSUE BEFORE SURGICAL EXCISION
3. **LINGUAL FRENULUM (L. BRIDLE)**
Midline fold from floor of mouth

**SUBLINGUAL PAPILLA-SWELLING AT BASE OF FRENULUM; OPENINGS SUBMANDIB. SALIV. GLANDS**

4. **FIMBRIATED FOLDS (PLICA FIMBRIATA) (L. FRINGE)** - Lateral to lingual frenulum, location of lingual veins

**SUBLINGUAL FOLDS (PLICA SUBLINGUALIS)** overlie & have openings for sublingual saliv. glands
1. **EXTRINSIC MUSCLES** - ATTACH TONGUE TO BONES

A) **GENIOGLOSSUS**
- O - GENIAL TUBERCLE OF MANDIBLE
- I - TONGUE TO ITS DORSAL SURFACE
- A - PROTRUDE

B) **HYOGLOSSUS**
- O - GREATER & LESSER HORNS OF HYOID BONE
- I - LAT. SIDE OF TONGUE
- A - DEPRESS

C) **STYLOGLOSSUS**
- O - STYLOID PROCESS OF TEMP. BONE
- I - LAT. SIDE OF TONGUE
- A - DRAWS TONGUE SUPERIORLY & POSTERIORLY
PROSECTION OF ORAL CAVITY

ORIENT:
LIFT SKIN OF CHEEK TO VIEW ABOVE

SD - SUBMANDIBULAR DUCT
LN - LINGUAL NERVE
XII - HYPOGLOSSAL NERVE
M - MANDIBLE (CUT)
MHM - MYLOHYOID MUSCLE
FA - FACIAL ARTERY
N TO MHM - NERVE TO MYLOHYOID MUSCLE
MA - MAXILLARY ARTERY
DGM - DIGASTRIC MUSCLE
SCMM - STERNOCLEIDOMASTOID MUSCLE
XI - ACCESSORY NERVE
ECA - EXTERNAL CAROTID ARTERY
IAA - INFERIOR ALVEOLAR ARTERY
IAN - INFERIOR ALVEOLAR NERVE
DTA - DEEP TEMPORAL ARTERY
SG - SUBMANDIBULAR GANGLION
SGM - STYLOGLOSSUS MUSCLE
XII - LESION - PROTRUDED TONGUE DEVIATES TOWARD SIDE OF LESION - due to unopposed action of the Genioglossus muscle.
VEINS OF NECK

1. Superficial Temporal & Maxillary vv. form Retromandibular V. (RM)

2. Retromand. V. Divides Ant. (AD) and Post. (PD) divisions

3. Ant. Division joins Facial V. to form Common Facial V. -> Int. jugular V.

4. Post. Division joins Post. Auricular V. to form External Jugular V-> Subclavian V.

5. Ant. Jugular from veins below mandible -> Ext. Jugular above clavicle
VEINS OF NECK

Pattern of Venous Drainage

SUPERFICIAL TEMPORAL V.

MAXILLARY V.

RETROMANDIBULAR V.

POST. AURICULAR V.

POST. DIV.

EXTERNAL JUGULAR V.

ANT. DIV.

COMMON FACIAL V.

TO SUBCLAV. V.

TO INT. JUG. V.

FACIAL V.
DEEP STRUCTURES IN PAROTID GLAND:
FORMATION OF RETROMANDIBULAR VEIN

NOTE: PAROTID GLAND DISSECTED AND REFLECTED

RV - RETROMANDIBULAR VEIN
ADR V - ANTERIOR DIVISION OF RV
PDRV - POSTERIOR DIVISION OF RV
FA - FACIAL ARTERY
AA - ANGULAR ARTERY
SLA - SUPERIOR LABIAL ARTERY
ILA - INFERIOR LABIAL ARTERY
FV - FACIAL VEIN
GAN - GREAT AURICULAR NERVE
STV - SUPERFICIAL TEMPORAL VEIN
STA - SUPERFICIAL TEMPORAL ARTERY
PAV - POSTERIOR AURICULAR VEIN (CUT)

MV - MAXILLARY VEIN
CFV - COMMON FACIAL VEIN
EJV - EXTERNAL JUGULAR VEIN
PG - PAROTID GLAND (cut and reflected)
Good luck!
PROSECTION OF TENSOR AND LEVATOR OF PALATE

RETROPHARYNGEAL SPACE - posterior to Constrictors; anterior to Prevertebral muscles

TP - TENSOR PALATI M.
LP - LEVATOR PALATI M.
PT - PHARYNGEAL TONSIL
HP - HARD PALATE
SP - SOFT PALATE
IM - INFERIOR MEATUS
IC - INFERIOR CONCHA
CG - CRISTA GALLI
FC - FALX CEREBRI
ST - SELLA TURCICA
TC - TENTORIUM CEREBELLI
TS - TRANSVERSE SINUS
SAS - SPHENOID AIR SINUS
SSS - SUPERIOR SAGITTAL SINUS
GG - GENIOGLOSSUS M.
GH - GENIOHYOID M.
MH - MYLOHYOID M.
HB - HYOID BONE
RPS - RETROPHARYNGEAL SPACE
Infection in retropharyngeal space can spread unimpeded to mediastinum.