ANATOMY THEME SESSION: Head and Neck – pharynx, larynx and thyroid gland

AIM
- Identify the different parts of the pharynx and describe the organization of pharyngeal musculature.
- Describe the framework (cartilages, ligaments and membranes) of the larynx.
- Discuss the muscles controlling the laryngeal inlet and muscles that control the movements of the vocal cords.
- Describe the nerve supply, blood supply and lymphatic drainage of the pharynx and larynx.
- Describe the different parts of the thyroid gland; its blood supply, relations and lymphatic drainage.

LECTURER ROLE
- Largely facilitatory: should NOT provide a mini-lecture to the students.
- When students first arrive, to orientate them to the notes and prosections relevant to the activity.
- To answer questions from students.

STUDENT ROLE
- View introductory DVD on the theme session website BEFORE attending the session.
- Make sure to identify all structures mentioned in the notes.
- To ask the tutor questions, but do NOT expect a mini-lecture on the topic.
- Attempt the quiz on the theme session website.
LEARNING ACTIVITY 1 - Pharynx

1. **Parts.** Identify the different parts of the pharynx; nasopharynx, oropharynx and laryngopharynx. Consider their different locations and structures.
2. **Muscles.** Appreciate the organisation of pharyngeal musculature; *identify* the superior, middle and inferior constrictors; the salpingopharyngeus, palatopharyngeus, stylopharyngeus.

Consider their roles in swallowing; which one raise, propel or constrict?
3. **Nerve supply.** Describe the nerve supply to the muscles and different regions of the pharynx.

4. **Blood supply and lymphatic drainage.** *Describe* the blood supply and lymphatic drainage of the pharynx.

What is the clinical significance of the lymphoid tissue of the pharynx?
LEARNING ACTIVITY 2 - Larynx

Using specimens and/or models.

1. **Cartilage.** *Describe* the framework of the larynx. *Identify* the cartilages.

2. **Muscles.** *Discuss* the muscles controlling the laryngeal inlet and muscles that control the movements of the vocal cords.

3. **Folds.** *Identify* the vestibular and vocal folds. Consider the function and content of each of these folds. Also *explore* the different shapes and positions of the vocal cords during phonation, normal respiration and forced respiration.

4. **Nerve supply.** What are the nerve supplies to the muscles and mucous membrane of the larynx?

   What would happen if there is a lesion to the recurrent laryngeal nerve and/or the superior laryngeal nerve?
LEARNING ACTIVITY 3 - Thyroid gland

Describe the different parts of the thyroid gland; its blood supply, relations and lymphatic drainage.

Indicate features of clinical interest.
LEARNING ACTIVITY 4 – Surface anatomy of the neck

Using the table below, explore the surface markings on yourself and other students. Consider the clinical significance of each of these structures/markings.

<table>
<thead>
<tr>
<th>FEATURE/POSITION</th>
<th>LEVEL/LOCATION</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyoid bone</td>
<td>• upper neck, C2 (C3)</td>
<td>• muscle fixation point - swallowing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• thyroglossal cyst</td>
</tr>
<tr>
<td>Thyroid prominence (BIG Granny Smith)</td>
<td>• mid-neck, C4</td>
<td>• vocal cords</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• laterally, bifurcation of common carotid (C3); carotid pulse</td>
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<tr>
<td>Cricoid cartilage (little Fuji)</td>
<td>• lower neck, C6</td>
<td>• cricopharyngeal sphincter (cricoid pressure)</td>
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<tr>
<td></td>
<td></td>
<td>• upper oesophagus/trachea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• cricothyroid lig: LARYNGOTOMY</td>
</tr>
<tr>
<td>Thyroid gland</td>
<td>• lower neck</td>
<td>• goitres</td>
</tr>
<tr>
<td></td>
<td>(thyroid cartilage, ~5th tracheal ring)</td>
<td></td>
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</tbody>
</table>

Clinical notes:

1. Cricoid pressure (Sellick’s manoeuvre).

- Application of backward pressure on cricoid cartilage to occlude oesophagus. This prevent aspiration of gastric contents during induction of anaesthesia and in resuscitation of emergency victim (e.g. full stomach in emergency surgery). Place the thumb and index finger on either side of cricoid cartilage and press directly backwards at force against the cervical vertebrae.
2. Swellings in the lower neck.

- It should be noted that swellings which indicate thyroid masses, including cysts, move upon deglutition (swallowing). This movement occurs because thyroid gland is enclosed in a layer of pretracheal fascia (a fascia of neck that attaches to hyoid bone, thyroid cartilage and extends down into thorax). Masses that do not move upon deglutition usually are not of thyroid origin.
LEARNING ACTIVITY 5 - Imaging

Identify the major structures shown in the MRI scan below.

Cross section of the neck at the level of the thyroid gland (MRI scan, courtesy of Prof. Heuck, Munich)

This material has been modified from Sydney Medical Program for teaching purposes of the University of Malaya Medical Program (UMMP) by the Department of Anatomy, Faculty of Medicine, University of Malaya.