Ear, Nose and Throat Examination
Study Guide

Clinical Skills Teaching & Learning Centre
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## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Angular stomatitis</td>
<td>Inflammation at the angles of mouth, with possible cracking or scaling, causes are multi-factorial.</td>
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<tr>
<td>Ankyloglossia</td>
<td>Tongue tie</td>
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<tr>
<td>Anosmia</td>
<td>Loss of smell</td>
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<tr>
<td>Aspiration</td>
<td>When something enters the airway or lungs by accident</td>
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<tr>
<td>Auricle</td>
<td>The outer part of the ear</td>
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<td>Epistaxis</td>
<td>Nosebleed</td>
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<tr>
<td>Gingivitis</td>
<td>Inflammation of the gums</td>
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<tr>
<td>Leucoplakia</td>
<td>White patches developed in the mouth</td>
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<td>Ossicles</td>
<td>Incus, stapes and malleolus</td>
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<tr>
<td>Otalgia</td>
<td>Pain in ear</td>
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<tr>
<td>Otorrhoea</td>
<td>Discharge in ear</td>
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<tr>
<td>Phonation</td>
<td>The process by which the vocal folds produce certain sounds</td>
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<tr>
<td>Pinna</td>
<td>See auricle</td>
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<tr>
<td>Polyp</td>
<td>Small growth, usually benign, originating in mucous membrane</td>
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<tr>
<td>Post nasal discharge</td>
<td>Catarrh</td>
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<tr>
<td>Rhinitis</td>
<td>Inflammation of the mucous membrane inside the nose.</td>
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<tr>
<td>Rhinorrhoea</td>
<td>Runny nose</td>
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<tr>
<td>Septum</td>
<td>A partition separating both nasal cavities.</td>
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<tr>
<td>Sinus</td>
<td>Connected system of hollow cavities in the skull – they filter and humidify air</td>
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<tr>
<td>Speculum</td>
<td>Latin word for “mirror” a medical device inserted into a body passage to facilitate visualisation or inspection</td>
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<tr>
<td>Sternutation</td>
<td>Sneezing</td>
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<tr>
<td>Tinnitus</td>
<td>Ringing or buzzing in the ears</td>
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<tr>
<td>Turbinate</td>
<td>Shell shaped network of bones, vessels and tissue in the nasal passageway</td>
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<tr>
<td>Tympanic membrane</td>
<td>Eardrum</td>
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Learning Objectives

Year 2
- To understand the anatomy and physiology of the ear, nose and throat
- To be able to inspect the external ear, nose and throat
- To understand the basic use of an otoscope and be able to identify the structures in your partner’s ear
- To be able to recognise common abnormalities in the ear
- To be able to take a nose and throat swab from a patient without contamination
Introduction

The ears, nose and throat are located near to each other and are intricately connected. Due to these connections a disturbance in one can cause a problem in or for the other, for example an ear problem may lead to post nasal drip in the throat which may result in an irritating cough. The ear, nose and throat form part of the respiratory system and share the same mucous membranes. The examination will involve an otoscope being inserted into the ear canal to examine the internal structures. The external structures of the ear will also be inspected, along with the internal and external structures of the nose and the throat/mouth. It can be a painful examination, especially if there is swelling/discharge in the ear canal.

Indications for an ENT examination.

There are a number of reasons for performing an ENT examination. These include, but are not limited to;

**Ear**
- pain (otalgia)
- vertigo
- foreign body
- tinnitus
- swelling
- deafness
- trauma
- discharge (otorrhoea).

**Nose**
- pain
- difficulty breathing through their nose
- nose is constantly running
- constantly sneezing
- epistaxis (nose bleeds)
- noticeable growths
- patient can smell an offensive odour
- loss of sense of smell etc.

**Throat**
- Sore throat
- Irritation
- tickly cough
- food sticking
- visible lesions
- change in voice.
Surface Anatomy / Relevant Physiology

Ear

The ear is divided anatomically and clinically into the external, middle and inner ear (figure 1). The external ear consists of the pinna (auricle), the external auditory canal and the tympanic membrane (eardrum). The tympanic membrane divides the external and middle ear. The function of the external ear (figure 2) is to collect sound, amplify it and channel it along the auditory canal to the tympanic membrane.

The middle ear consists of the ossicles; three small bones: the malleus, incus and stapes (the smallest bone in the body) that are connected and transmit the sound waves to the inner ear. The eustachian tube is also in the middle ear. This connects the middle ear to the back of the throat and helps to equalize the pressure in the middle ear (enabling proper transfer of soundwaves).
The inner ear consists of the cochlea, containing the nerves for hearing, the vestibule, containing the nerves for balance (cranial nerve VIII is the vestibulocochlear nerve). The functions of the inner ear is to convert the mechanical signs received from the middle ear, to electrical signals which transfer the information to the auditory pathway in the brain. It also maintains balance by detecting position and motion.

Nose

The external nose consists of two nasal bones, providing support and stability to the nose. The structure of the nose is supported by stiff paired upper lateral cartilages. The lower third of the nose consists of softer lateral cartilages. (figure 3)
Internally the nostrils are separated by the nasal septum (made of bone and cartilage). There are three turbinates (conchae) on each side of the nose. (Figure 4). The mucous membrane is a thin tissue that lines the nose, sinuses and throat. It warms and moistens airflow and makes the sticky mucous that helps to clean the air of dust and other small particles. Additionally nasal hair will filter foreign particles and prevent them from entering the nasal cavity. Additionally there are paired sinuses (frontal, sphenoid, maxillary and anterior and posterior ethmoid sinuses) which are air filled spaces in the skull.

The nose allows air to enter the body. As it does it passes over specialized cells of the olfactory system which the brain can then recognise and identify smells. The air is also warmed, as mentioned before, and then passes to the lungs. During a nasal examination a special speculum will be used to open the nostrils out and then a torch can be used to examine the internal aspect of the nose. It can be a little uncomfortable for the patient, but should not be too painful.
Throat

Although the mouth and throat form part of the gastrointestinal tract, they would also be examined as part of an ENT examination. The oral cavity (figure 5) contains the anterior two thirds of the tongue, which has filiform papillae containing taste buds, giving the tongue its velvet texture. It also contains the floor of the mouth, the hard palate and the inner surfaces of the gums and teeth. There are salivary glands present in the mouth (parotid, submandibular and sublingual). The parotid duct opens behind the 2nd molar (figure 6).

The pharynx is a shared upper aerodigestive channel running from the anterior tonsillar pillar to the laryngeal inlet. The larynx (voice box) prevents aspiration and is responsible for phonation. It is formed by two external cartilages, the thyroid cartilage (Adam’s apple) and the cricoid cartilage, separated by the cricothyroid membrane.
**History**

Prior to any clinical examination you should have taken a detailed history from the patient to enable you to tailor the examination to the patient’s presenting complaint and current clinical condition. The patient may complain of a variety of symptoms which would require an ENT examination.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Signs and symptoms</th>
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<tbody>
<tr>
<td><strong>EAR</strong></td>
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<tr>
<td>Tonsilitis</td>
<td>Enlarged tonsils +/- exudate, pyrexia, adenopathy</td>
</tr>
<tr>
<td>Otitis Externa</td>
<td>Earache, discharge, inflammation, temperature</td>
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<tr>
<td>Vertigo</td>
<td>Nausea, vomiting, postural or gait instability, dizziness,</td>
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<tr>
<td>Perforated TM</td>
<td>Bleeding to ear, reduced hearing,</td>
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<tr>
<td><strong>NOSE</strong></td>
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<tr>
<td>Epistaxis</td>
<td>Nose bleed, possible hypertension,</td>
</tr>
<tr>
<td>Rhinitis</td>
<td>Runny nose, mucosal inflammation, sneezing</td>
</tr>
<tr>
<td><strong>THROAT</strong></td>
<td></td>
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<tr>
<td>Cancer</td>
<td>Leukoplakia, swelling, difficulty swallowing,</td>
</tr>
<tr>
<td><strong>ALL</strong></td>
<td></td>
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<tr>
<td>Foreign body</td>
<td>Hearing problems, pain, discharge, swallowing problems. (May be nasal, auricular or in throat.)</td>
</tr>
</tbody>
</table>
Preparation

Patient safety

- Introduce yourself
- Check the patient’s identity and allergies
- Explain what you want to do
- Gain informed consent
- Consider an appropriate chaperone, although it is unlikely to be needed with an ENT examination
- There is no need for the patient to undress for this examination
- Position the patient appropriately – consider moving and handling – the patient can be examined in a chair or on the couch / bed
- Wear Personal Protective Equipment as required.
- Wash your hands before and after you touch the patient (as per WHO guidelines)

On first meeting a patient introduce yourself and confirm that you have the correct patient with the name and date of birth, if available please check this with the name band, written documentation and the NHS number/ hospital number/ first line of address.

Check the patient’s allergy status, for an ENT examination the equipment used is unlikely to cause reactions, but it is good practice to check allergies.

Ensure the procedure is explained to the patient in terms that they understand and gain informed consent.

This procedure does not normally require the presence of a chaperone.

Generally, personal protective equipment (PPEs) may be required if the patient has bleeding or discharge from the ears / nose. Generally gloves are not usually worn for this examination. As always ensure good hand hygiene and wash your hands before and after touching the patient. Please be aware that the current guidelines the message from the school is that students should not be going anywhere near aerosol generating procedures (AGP). For non AGPs a facemask must be worn at all times.

Patient Positioning / Exposure

For this examination the environment should be well lit, warm and private, The patient can sit in a chair where you can get good access to the head and neck.
Equipment

For this examination you will need:

1. Hand wash
2. Otoscope and speculum covers
3. Thudichum Speculum

Inspection

Ear General Inspection

The initial inspection can be performed with the patient sitting in a chair. There should be room behind the chair for the clinician to stand so they can assess lymph nodes more easily. However the patient could also be on a couch either sitting or lying down. When inspecting the ears, check the size, shape and symmetry of the pinna and compare with the other ear.

Specific inspection

For ear examination an otoscope is used, this can be used as a torch to examine the external ear (figure 7) checking for abnormalities.

Observe the ear and around the ear for any ulcers, lumps, scars, areas of tenderness or if the patient has hearing aids. Remember to examine the posterior aspect of the ear (figure 8), the sulcus (the grove behind the ear) and mastoid.

On inspection of the external meatus there may be evidence of discharge, which could be blood or pus indicating possible trauma or infection. Additionally the area may be swollen or there may be notable masses present.
For the internal ear use the otoscope and an appropriate sized speculum. You should use the largest sized speculum that fits comfortably into the patient's ear.

The otoscope should be held in the right hand to examine the right ear and held between the thumb and index finger, resting on the middle finger as seen in figure 9. The patient should be positioned with their head flexed laterally away from the examiner (figure 10). The external auditory canal, is slightly S-shaped and normally restricts the examiner's view of the tympanic membrane. The pinna needs to be gently pulled upwards and backwards to straighten the canal. This should be done with the hand not holding the otoscope. If a patient has a painful ear or is presenting with a history of otorrhoea, then examine the 'good' ear first.

Examine the canal and the canal wall and look for discharge / debris (figure 11), note any swelling or masses and if there is any wax present. Foreign bodies such as peas or Play Doh may be found in children’s ears, whereas the tips of cotton buds may be found in adults ears.

Finally inspect the tympanic membrane and identify the normal structures to see if there is any significant variation in appearance. Observe the colour and shape checking for perforations or scars. Check the ossicles (if visible) and observe for the presence of the light reflex (cone of light), a distortion of the cone of light could be a sign of increased middle ear pressure. Finally check to see if there is any fluid behind the tympanic membrane, sometimes made more noticeable due to the presence of air bubbles, a fluid line or ballooning of the membrane. Change the speculum prior to inspecting the patient's other ear to prevent cross contamination if an ear infection is suspected.
Inspection of the tympanic membrane

You should be able to identify the normal structures of the tympanic membrane (figure 12 and 13) to see if there is any significant variation in appearance. Observe the colour and shape checking for perforations or scars. Check the ossicles (if visible) and observe for the presence of the light reflex (cone of light), a distortion of the cone of light could be a sign of increased middle ear pressure. Finally check to see if there is any fluid behind the tympanic membrane, sometimes made more noticeable due to the presence of air bubbles, a fluid line or ballooning of the membrane. Change the speculum prior to inspecting the patient’s other ear to prevent cross contamination if an ear infection is suspected.

Palpation

Palpate around the ear for signs of tenderness and also palpate for lymph nodes. You will need to palpate gently, especially if there is a history of trauma. For the ear exam the relevant lymph nodes would be the pre and post auricular nodes.

Nose General Inspection

When you first see the patient you may note if the nose is deviated or deformed. It may be long stanging or may be the reason for their attendance.
Specific inspection
Inspect the nose to assess the shape - look from the sides and above, ask the patients if they have noticed any changes. Observe for any abnormal nasal creases, deviation, scars, discharge or crusting, redness or skin disease, do you note any offensive odour?

Inspect the front of the nose first by tipping the nose up and inspecting without a speculum. You can insert a big otoscope speculum as far as the nasal hairs go (figure 14 A) or use a Thudichum or Kilian speculum (figure 14 B & 15) and a light. Don’t touch the septum; it’s very sensitive. You should be able to identify the septum medially and the inferior turbinates laterally.

Internal inspection should also cover the mucosa, is there any swelling, redness or oedema (rhinitis), the septum should be straight but may be deviated, especially following trauma. The septum should be pink in colour due to the rich supply of blood. Check for any sign of a septal haematoma (shine the torch in one nostril while looking in the other, it should glow a pinky red colour, however if there is a haematoma is may be darker as the blood is blocking the light?)

Observe for any masses (or foreign bodies in a child), polyps (figure 16) (abnormal growth of tissue projecting from a mucous membrane) which appear are grey / yellow whereas turbinates are normally pink. Oedematous turbinates can look like polyps (e.g. in hay fever when inflamed) but polyps are not sensitive to touch whereas turbinates are exquisitely so. Also be aware that you may need to inspect the mouth to observe nasal problems e.g. polyps or tumours may hang into the pharynx or grow through the palate.

To assess the nasal airway cover one nostril and ask the patient to sniff. This gives a reasonable idea of the nasal airway and it sounds wet if there is discharge. Perform the cold spatula test, where by a cool piece of metal is placed under the nose to see if it mists which represents condensation from the breath from each side of the nose. Can be recorded as
diminished misting on the right – left or bilaterally. Airway patency is very subjective; even flow meter readings often don’t match patient scoring.

**Palpation**

Again palpate around the nose for signs of tenderness and also palpate for lymph nodes. You will need to palpate the nose gently, especially if there is a history of trauma. As stated, be aware the turbinates are sensitive to touch. Again lymph nodes may need to be palpated.

**Throat General Inspection**

On general inspection observe for any obvious swellings, deformity, assymetry or tracheal deviation.

**Specific inspection**

Examining the throat will start with inspection of the lips. Note pallor, angular stomatitis, which can be a sign of impetigo, thrush or other infections (figure 17) and asymmetry. Retract the lips with the teeth partly closed, the patient can assist with moving the lips.

Examine the gums (with and without any dentures) note any gingivitis (inflammation of the gums), ulcers (eroded patches of tissue), missing teeth, dental carries. Note the buccal mucosa of the cheeks (figure 18) it should be pink and healthy. As mentioned before the parotid duct opens behind the 2nd molar.
Ask the patient to lift their tongue. If the tip can touch the roof of the mouth superiorly and extend beyond the vermillion border (outer edge of lips) inferiorly there is no significant tongue tie (Ankyloglosia). Inspect the floor of the mouth to beyond the last molar, use a spatula / tongue depressor, against the cheek and also hold the tongue across. Note oral hydration, halitosis, ulcers or masses. Use a bright light. With the tongue out, inspect the tonsils, uvula and soft palate. Ask for head up to inspect the palate. Use a tongue depressor to raise the tongue edges to inspect the underside of the tongue in detail. Inspect the back of the mouth and look for abnormalities to the tonsils or, in the case of figure 19 a nasopharangeal tumour, presenting in the throat. Any further examination of the larynx requires specialised equipment.

**Palpation**

Palpate any swellings for signs of tenderness and also palpate for lymph nodes. You will need to palpate the throat gently, it can be uncomfortable pressing directly onto the throat. The lymph nodes to palpate will vary on the presenting complaint and history, however the ones linked to a throat examination would be submental, submandibular, jugulodigastric and the cervical chain, deep, superficial and posterior.

Remember in health lymph nodes are impalpable. However, enlarged lymph nodes may be palpable and the size needs to be determined. Note texture and whether they are painful when palpated or not. See the lymph node study guide for further information. Palpation can be carried out at the start of the examination or the end, as long as you remember to do it.
Additional Tests / Special Tests

Obtaining Swabs

Obtaining a swab is the process of obtaining tissue or fluids for laboratory analysis. It is a step in investigating the nature of disease to determine diagnosis and mode of treatment. The skill must be performed adhering to Trust guidelines to reduce any risk to the health and safety of those handling the samples and to reduce the risk of erroneous data and/or results, predominantly caused by contamination of the sample. Those tasked with taking any sample must be aware of the key parts used in the procedure and ensure they are not contaminated. For example:

Image A shows the key part of the swab and its sealed tube with outer packaging open just before the swab is taken. Both the tube and swab are key parts.

Image B shows the tube lid removed ready to receive the used swab (this must be done in quick succession to the sample being taken to minimise exposure of both key parts being contaminated by air or other surfaces.

Image C shows the used swab being placed in the tube
Image D the tube sealed ready to be labelled and transported to the lab.

Please see nasal swab video for guidance on how to take a swab under direct vision of an area of concern.

Below, is a detailed explanation of how to obtain a swab of the nasopharynx, swabs of the ears or throat and surrounding tissues that are symptomatic (inflamed or purulent) are taken directly from the area of concern but with the same equipment and method described below.

**Nasal swabs**
May be collected to detect the presence of respiratory viruses/infections the sensitivity is comparable with the nasopharyngeal aspirates for certain viruses (Heikkinen et al, 2001). A swab may be taken within the nasal cavity under direct observation of an area of concern, in this case the swab would be applied only to the area of concern and not advanced further than can be observed.

**Equipment needed:**
- Hand wash
- Gloves
- apron
- the swab
- tissues
- appropriate documentation.

**Procedure:**
Please refer to the patient safety information above which applies to all clinical examinations and procedures.
- After washing hands and putting apron and gloves on
- Offer the patient a tissue to blow their nose before hand
- Open swab outer packaging, checking expiry date
• Insert the swab on to the area of concern and gently rotated to obtain a sufficient tissue or exudate sample.
• To avoid contamination the swab must then be placed directly back in the swab tube and its medium without touching any other surfaces
• The swab and documentation should be completed and stored correctly for dispatch to the laboratory.
Documentation

Be sure to report any abnormal findings to your supervisor

Your findings should be written in a clear and concise manner aided with pictures or diagrams where appropriate. All abnormalities should be reported to your supervisor.

Included in all documentation:

- Patient's name.
- Hospital ID number or NHS number.
- Date. dd/mm/yyyy
- Time in 24 hour clock format.
- Signature of the person conducting the examination.
- Print the examiner's name and that of the chaperone.

If swabs are taken the form and the tubes should be filled in correctly and should detail the exact area the swab was obtained from, for example: the right nare (nostril) of the septal surface.

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<tr>
<th>UROGENITAL DIAGNOSTIC &amp; SCREENING</th>
<th>Details</th>
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<tbody>
<tr>
<td>CLINICAL SKILLS Teaching and Learning Centre</td>
<td>Relevant Clinical Details</td>
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<tr>
<td></td>
<td>Antibiotics</td>
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<tr>
<td></td>
<td>Name of antibiotic</td>
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[Table containing various check boxes and options for different medical conditions and tests.]

Figure 20
Bibliography & Further Reading

References

4.

Picture Credits

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1. By Lars Chittka; Axel Brockmann - Perception Space—The Final Frontier, A PLoS Biology Vol. 3, No. 4, e137 doi:10.1371/journal.pbio.0030137 (Fig. 1A/Large version), vectorised by Inductiveload, CC BY 2.5, https://commons.wikimedia.org/w/index.php?curid=5957984
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9. CSTLC
10. CSTLC
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19. CSTLC

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