

The Royal Victorian Eye & Ear Hospital



Nursing Learning Package

REMOVAL OF EAR WAX AND CONDITIONS OF THE EAR

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LEARNING PACKAGE

AIM:

This training package is a competency based training program for Outpatient Department Nursing Staff to enhance their ENT knowledge and support the development of an ear care clinic. This training program will develop the nursing staff skill set to ensure that the highest standards of care continue to be delivered at the Royal Victorian Eye and Ear Hospital.

OBJECTIVES:

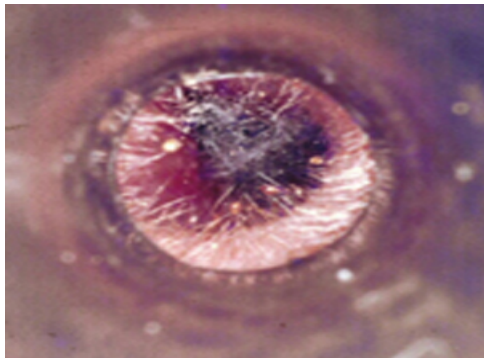
After completing this module and with practice the nurse should be able to:

1. Identify the structures of the ear
2. Describe the different areas of the external ear
3. List the functions of the external ear
4. Discuss the function(s) of cerumen
5. Identify the indications for removal of wax
6. Identify common pathological conditions which may be present in the external ear
7. Identify the various ways the ear can be illuminated
8. Perform an accurate examination of the external ear
9. Recognize any abnormalities in the patient's history &/or examination
10. Document accurately information and findings of examination
11. State the circumstances the patient would be referred to the doctor
12. Competently demonstrate aural suction of the ear and removal of wax
13. Describe any follow-up care that may be required

Overview

Cerumen is a secretion of glands in the hair bearing region of the ear canal. It is formed as a greasy material but for a number of reasons it may fail to leave the canal, become dry and hard and may accumulate to the point that it is impacted in the depth of the canal. The aim of this course is to demonstrate the techniques of removing wax safely using a wax ring or suction.

The prismatic binocular headlight gives such a good view into narrow places that removal of a lump of wax that is obstructing the view into the depth of the canal becomes a simple manoeuvre with a wax ring. With training we believe it should be possible to treat impacted wax without referral to an otology clinic or using the syringe technique.



A nasal speculum can open the canal and reveal a boggy mass of cerumen.

Removal of wax opens several other clinical possibilities.

- The picture above shows the typical appearance of impacted cerumen. There is no space around the mass to pass a wax ring and syringing will be ineffective for the same reason.
- We cannot be sure whether this is accumulated keratin associated with a perforated drum until the drum is examined. Until then syringing the ear risks driving infection into the middle ear and causing damage to the inner ear.
- Commonly impacted cerumen is putrid. In this case it is not enough to remove the wax in the ear but the otitis externa will need ongoing treatment by an otologist.
- Though the patient might notice an improvement in hearing it maybe misleading because the wax impaction is not noticed initially by people with presbycusis (degenerative conductive deafness).

Removal of Wax

Cerumen is produced to protect the ear by trapping dirt and foreign bodies in the sticky wax and hairs. It should only be removed to allow inspection of the drum or for treating symptoms caused by accumulation or putrefaction.

Please read the following article:

[Clinical practice guideline: Cerumen impaction. Otolaryngology Head and Neck Surgery \(2008\)139, S1-S21 Roland Peter S. et al](#) It has been produced by a multidiscipline panel.

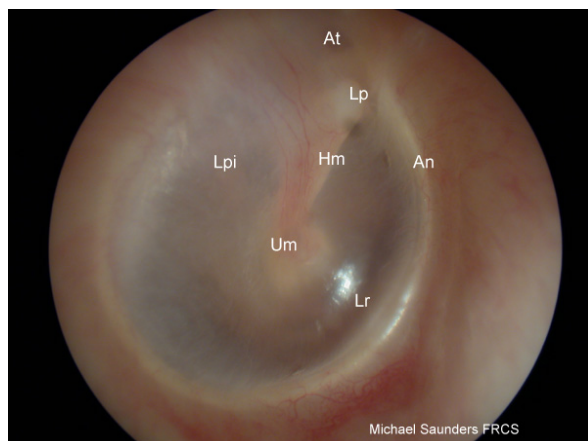
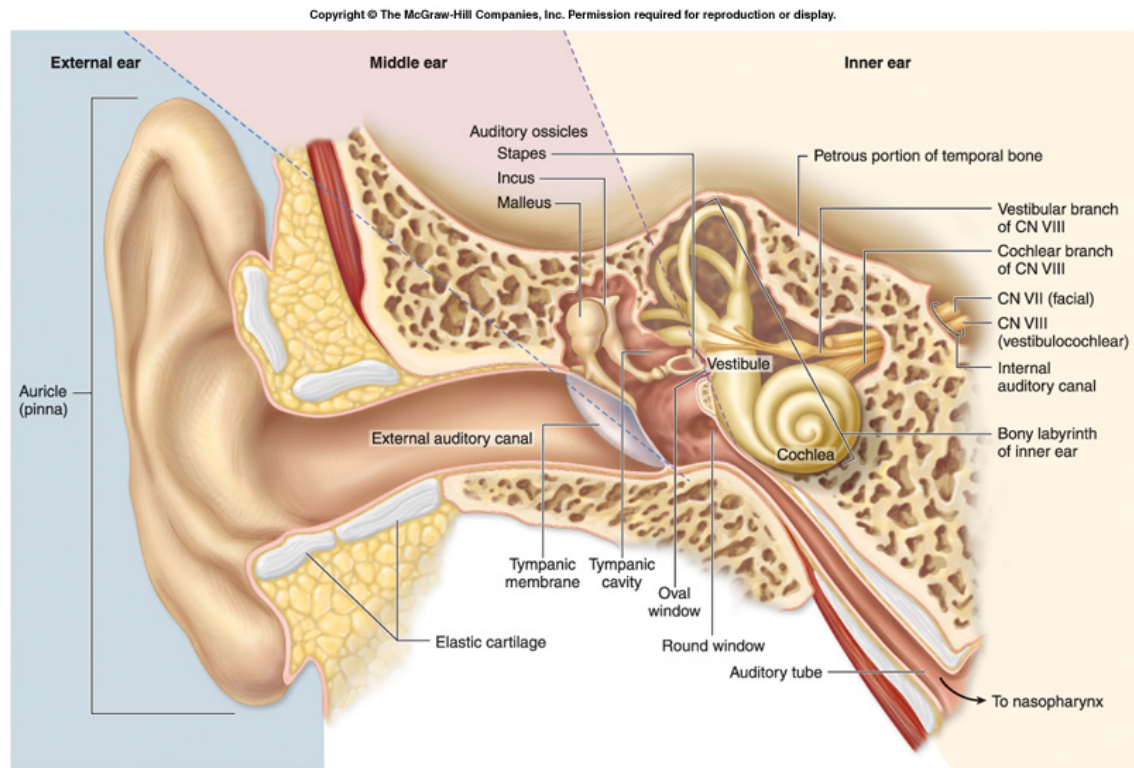
It has defined the presentations that require intervention, and made recommendations about their management.

Indications for removal of wax include:

- Difficulty in examining the full tympanic membrane
- Otitis externa
- Wax occlusion of the external ear canal
- As part of the workup for conductive hearing loss
- Prior to taking the impression for hearing aid fitting
- Suspected external ear canal or middle ear cholesteatoma
- Suspected external ear canal pathology such as squamous cell carcinoma or eczema
- As part of the follow-up to canal wall down mastoidectomy
- As part of grommet insertion or middle ear surgery (preoperatively or perioperatively)
- Patient request

Anatomy

The ear canal as part of the temporal bone



Anatomy of the tympanic membrane:

- An long process of incus* – sometimes visible through a healthy translucent drum
- Um Umbo* – the end of the malleus handle & the centre of the drum
- Lr light reflex* – antero-inferiorly
- Lp lateral process of malleus*
- At Attic* – also known as *pars flaccida*
- Hm* – handle of the malleus

Illumination

Illumination is designed to free your hands and use both eyes.

VoroTek headlight gives stereoscopic vision into narrow holes. Adjust the prisms to provide a single image for an object sited about 25cm from the face.

When the casing is mounted on a spectacle frame prescription lenses may be fitted.

When the lamp is shared amongst clinicians, some of whom use spectacles, it is sensible to use a headlight mounted on a head band.

Practice examining right and left ears changing hands for each side

Practice using a probe or speculum to hold the tragus out of the view.

Practice retrieving a lump of Blue tack from the depth of a pen cap.



The otoscope is a common source of illumination. Select the largest speculum that will fit the canal. Hold the otoscope like a pen, not like a hammer. Rehearse using it with either hand. Open the tragus and cartilage ring gently, beyond this depth the bony part of the ear canal is tender. Look through the lens and, using the mind's eye, find the posterior wall of the canal. As you insert the speculum further follow the posterior wall to its junction with the posterior rim of the drum.



Examination of External Ear and Tympanic Membrane

Systematically examine the drum

1. Move the speculum so your view pans across the drum as far as the alcove.
2. Identify the malleus and umbo
3. Change the view again and perhaps tip the head away to find the short process
4. If the drum is transparent seek the outline of the incus.

5. Confirm your orientation by locating the light reflex



Illustration of the effect the anterior wall of the canal has on the view of the drum
Note that the anterior wall of the ear canal often bulges into the line of view and restricts the view of anterior half of the ear drum.

Pathology

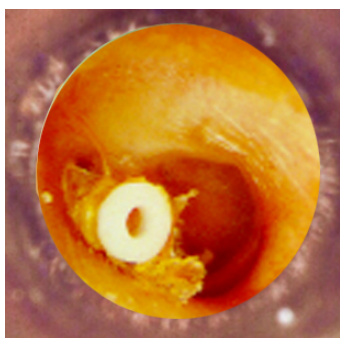
When working within the Wax Clinic it is important that the normal development and resorption of wax is understood.

Ear wax contains sebaceous material and the secretions from the ceruminous glands which line the outer one-third of the ear canal. The primary component of ear wax is keratin (derived from dead skin). These secretions combine with desquamated skin and hair to form wax. Wax (cerumen) appears to be partly controlled by circulating catecholamines. It is normal to have some cerumen in the ear canal where it provides protection to the skin and also possesses bactericidal activity. Ear canal epithelium migrates outwards, providing a natural cleaning mechanism for desquamated tissue and cerumen. Wax provides protection to the skin and also possesses bactericidal activity. Attempts to clean the ear usually forces the ear canal contents deeper into the meatus. Wax impaction is therefore a common cause of hearing loss. If water enters the ear, the desquamated keratin expands, often trapping fluid deep in the canal. This may cause otitis externa unless the plug is removed.

Reasons for wax or keratin not passing out of the ear canal include:

- dermatitis such as eczema or psoriasis
- genetic disorders such as keratosis obturans and ichthyosis
- loss of elasticity of the canal skin with aging
- a narrow canal such as we see in Downs Syndrome

If wax and keratin build up in the ear it may eventually lead to putrefaction of the keratin and infection that may spread back to the middle ear. Surgical closure of the perforation is also effective at preventing keratin accumulation. Patients will not let you remove keratin adhering to a tympanostomy tube. Pulling at a large mass of keratin adherent to the drum risks pulling the ossicle out.



Perforation & ventilation tubes.
caused by abnormal flow of
keratin



Swollen,
inflamed ear
– otitis
externa



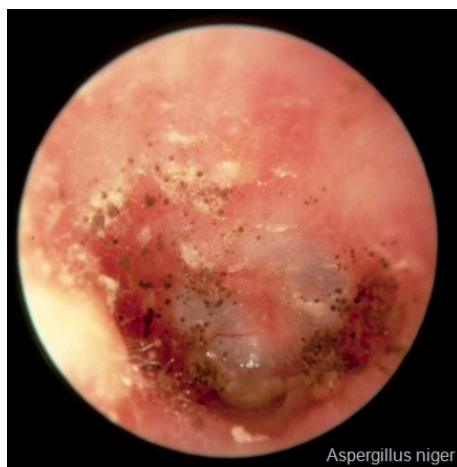
Inflamed, red
external ear canal
– otitis externa

Pathological conditions of the ear

Otomycosis

The humid, dark conditions in the canal almost inevitably lead to putrefaction of this material by fungus such as *Aspergillus niger* (80-90%) and *Candida albicans*. The fungus breaks through the skin. Bacterial cellulitis is from saprophytic bacteria such as *Pseudomonas aeruginosa*, *Proteus* and *Staphylococcus aureus*. The features of cellulitis are

- offensive odour and scanty discharge
- swelling of the skin
- tenderness below the ear canal, and pain moving the pinna
- osteomyelitis if there is diabetes present



Asp. niger – characterised by black spots.

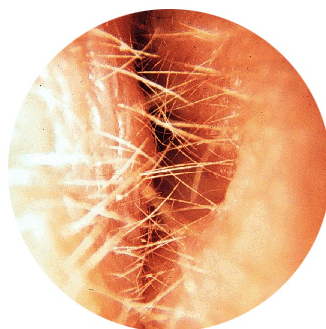
C. albicans – characterised by white discharge.



Other pathology found while cleaning the ear, which should be brought to the notice of an otologist include:

Diffuse otitis externa

Also known as “swimmers ear”, but since the cause of the infection is water trapped in the ear canal, bathing or showering may also cause this common infection. When water is trapped in the ear canal, bacteria that normally inhabit the skin and ear canal multiply, causing infection and irritation of the ear canal. If the infection progresses, it may involve the outer ear.



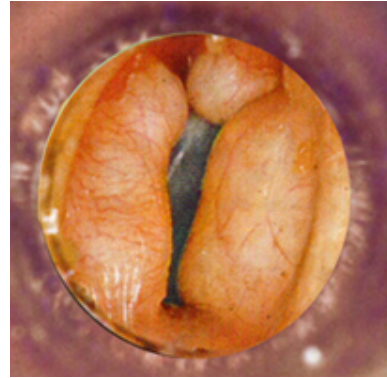
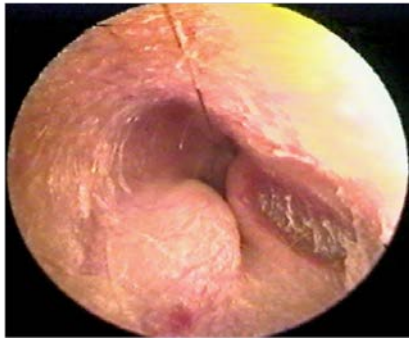
Ear Canal Swollen Shut



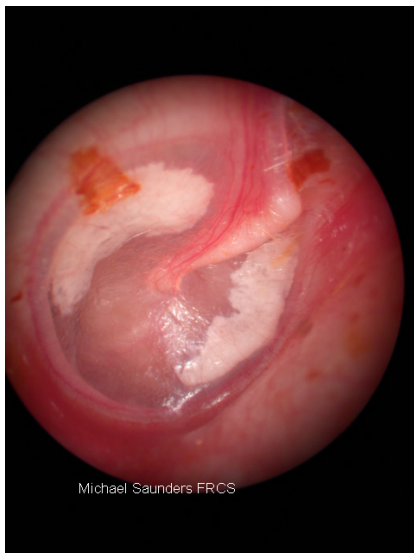
Earwax and Wet Debris

It is urgent to reduce the swelling of the canal and clean the depth of the canal and region beside the drum. Persistent discharge from the middle or external ear tends to dry out and create debris that looks like wax. Relapse of infection is commonly from infection hidden by the crust. In the either type of infection it is important to see that the cycle of infection has been controlled

Exostoses are bony lumps found in the depth of the canal. They are the result of swimming repeatedly in cold water. They block the hearing suddenly because, after swimming, water tends to gather deep to very big lumps.



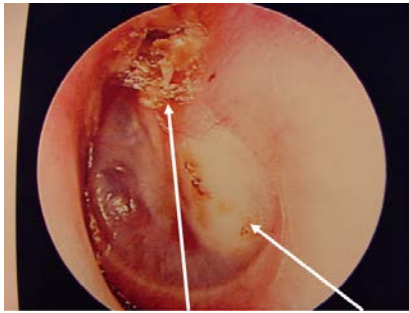
Tympanosclerosis is a white patch is calcified thickened scar tissue. It is a late outcome of Eustachian obstruction.



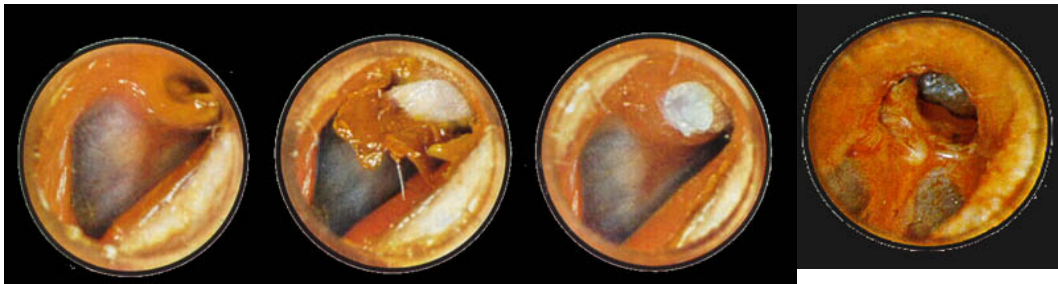
Dangerous lesions

Sometimes the debris removed from the drum and roof of the canal will reveal **cholesteatoma** extending into the ear canal from the attic of the middle ear. Just as this inflammation has eroded the bone of the canal it can erode other walls of the middle ear and

cause lethal infections. The cases that have been life threatening have been undiagnosed for years.



Cholesteatoma source and extension to middle ear behind the ear drum



This hole above the short process appears to be clean but could be associated with very slow discharge and relapse of "wax" in the canal especially if there is cholesteatoma in the middle ear.

Instruments

The instruments used in removing wax and detritus



Ear specula

Ear specula vary in shape according to their purpose.

1. Speculae made to attach to an otoscope are round in section.
2. Speculae with a trumpet shape are useful for cleaning the canal because the shape keeps instruments out of the view.



Pneumatic otoscopy

1. Pneumatic otoscopy is an examination that allows determination of the mobility of a patient's tympanic membrane (TM) in response to pressure changes. The normal tympanic membrane moves in response to pressure. Immobility may be due to fluid in the middle ear, a perforation, or tympanosclerosis, among other reasons. It is important, as it can indicate the presence of effusion even when the appearance of the eardrum otherwise gives no indication of middle ear pathology. The speculum is oval so that it seals better with the ear canal of an adult. Notice that the lens of the Siegle device is placed so it is parallel to the drum.



The Siegle speculae and lens set is made to seal in the ear canal and work as a pneumatic otoscope.

Operation microscope



The binocular operating microscope is an asset for treating external otitis, impacted wax or foreign bodies.

Suction

Suction removes softened debris without digging or rubbing.

Prolonged suction will cool the inner ear and induce vertigo.

Suction is noisy for the patient.

The bony walls of the canal are tender at any time but particularly if you try to winkle adherent keratin from them.



An assortment of ear suction devices.

Lifting instruments

1. A perforation of the drum is often associated with accumulation of keratin at the rim. It looks like impacted wax.
2. If you do not know whether the drum is perforated it is reasonable to use ear drops to soften the outer layers of the plug and suck away the softened material.
3. Wetting and suction and should completely replace the use of a syringe when the material is hard to move

Wax removal instruments



If the wax is very hard or very difficult to remove or on the ear drum then Hydrogen Peroxide should be used to soften and moisten the wax. The patient should lie of the opposite side for at least 10 minutes. This often will facilitate wax removal. If the nurse thinks that further attempts to remove the wax may either hurt the patient or she/he is concerned about its removal the doctor should be



Skills

Ear cleaning simulation

Removing impacted wax can take a long time.

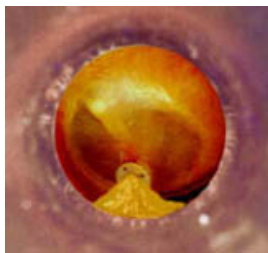
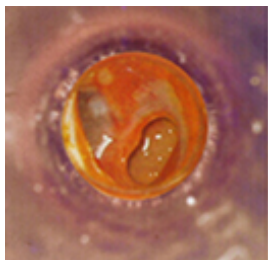
The wax ring is often used but takes more space than a sucker and could rub tender parts of the canal.

1. Select one that can be inserted beyond the object without touching the walls.
2. If this is not possible the outer layer of the debris should be moistened and suction used to lift out fragments of the mass.
3. Suction avoids digging into the canal walls.
4. Tap water is as effective as patented solvents at softening or fragmenting the wax.
5. Hydrogen peroxide may be used to accelerate the process by fragmenting the mass with effervescence if there is space for the fluid to seep through.
6. The kernel of the mass is often hard and may be rolled out with a bent fine needle or wax ring.
7. When the wax is smelly or clearly associated with fungal infection assume there will be continuing infection obvious within a week.
8. Check the hearing because people with presbycusis may not appreciate that there hearing has reason they allowed the wax to gather without doing something about it sooner.

Examples

Examples of ear conditions needing cleaning.

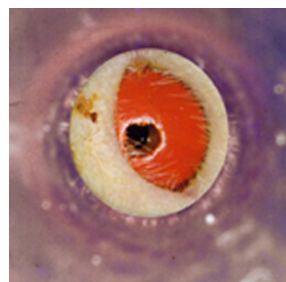
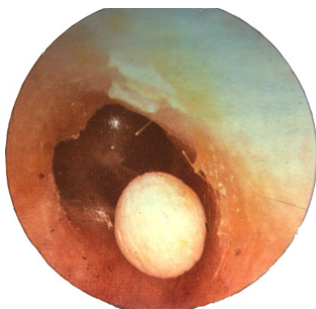
How would you deal with the following examples?



A cotton swab may be used to maintain a dry ear canal or expose an important feature but a sucker would be needed to remove a mass of debris



Which instrument would you use to remove these foreign bodies?



Use the wax ring when there is enough space around the object.
Seek a specialist opinion; perhaps use a fine cotton swab in a narrow canal.
Use a hook to catch the bead