



# CLINICAL PRACTICE GUIDELINE: CERUMEN IMPACTION

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Presenter : R1 韋佩吟  
Supervisor: VS 褚嘉慧

- Cerumen is a naturally occurring substance that cleans, protects, and lubricates the external auditory canal.
- Cerumen forms when glandular secretions from the outer one-third of the ear canal mix with exfoliated squamous epithelium.



- Cerumen is eliminated by a self-cleaning mechanism, which causes it to migrate out of the ear canal, assisted by jaw movement.
- Excessive or impacted cerumen is present in one in 10 children, one in 20 adults, and more than one-third of the geriatric and developmentally delayed populations



- The target patient for this guideline is over six months of age
- Cerumen impaction
  - Accumulation of cerumen that causes symptoms, prevents a needed assessment of the ear canal/tympanic membrane or audiovestibular system
- Symptoms
  - hearing loss, tinnitus, fullness, itching, otalgia, discharge, odor, or cough



# BURDEN OF CERUMEN IMPACTION

- 2% to 6% of the general population in the United Kingdom suffers from cerumen impaction
- Cerumen impaction is more common in the elderly and in patients with cognitive impairment.
  - 19% to 65% of patients over 65 years old have cerumen impaction
  - 28% to 36% of developmentally delayed adult population
- associated with hearing loss and diminished cognitive function



- Patients seek treatment for cerumen impaction for a host of symptoms.
- Pain, itching, sensation of fullness, tinnitus, odor, and dizziness
- complete occlusion can result in significant hearing loss



## STATEMENT 1A

- DIAGNOSIS OF CERUMEN IMPACTION:  
Clinicians should diagnose cerumen impaction when an accumulation of cerumen 1) is associated with symptoms, or 2) prevents needed assessment of the ear, or 3) both.



- only problematic cerumen is considered impacted
- clinicians should diagnose cerumen impaction when an accumulation of cerumen causes symptoms, prevents needed assessment of the ear, or both
- Symptoms of cerumen impaction
  - otalgia; tinnitus; fullness in the ear; pain; cough; hearing loss; and vertigo





- Cerumen impaction may impair a clinician's ability to visualize the tympanic membrane and assess the status of the middle ear.
- children ranging in age from 2 to 60 months
  - cerumen was removed in 89 of 279 children (29%) subsequently diagnosed with acute otitis media
  - cerumen impaction can inhibit or prevent diagnosis of middle ear disease
- If cerumen in the ear canal would compromise auditory or vestibular testing, cerumen impaction is also diagnosed



## STATEMENT 1B

- MODIFYING FACTORS: Clinicians should assess the patient with cerumen impaction by history and/or physical examination for factors that modify management such as one or more of the following: non-intact tympanic membrane, ear canal stenosis, exostoses, diabetes mellitus, immunocompromised state, or anticoagulant therapy.



- The management of cerumen can be influenced by host factors or anatomic abnormalities of the ear canal or tympanic membrane.
- assessment of these factors by history, physical examination, or both
- Anatomic factors
  - Stenosis
  - Exostoses or osteomas
  - Limiting visualization or increasing the likelihood of trauma



- A perforated tympanic membrane limits the options available for cerumen removal
- Depending on the irrigation solution used, infection, pain, or ototoxic hearing loss could result
- irrigation could produce caloric effects resulting in vertigo
- Mechanical removal of cerumen is the preferred technique when the ear drum is not intact.



- Irrigation with tap water has been implicated as an etiologic factor of malignant external otitis
  - Immunocompromised, AIDS patients
- Patients who are on anticoagulant therapy are at higher risk for cutaneous hemorrhage or subcutaneous hematomas



## STATEMENT 2

- OBSERVATION OF NONIMPACTED CERUMEN:  
Clinicians may observe patients with non-impacted cerumen that is asymptomatic and does not prevent the clinician from adequately assessing the patient



- Cerumen is a naturally occurring product of the ear canal
- self-cleaning mechanism: normal lateral migration of epithelium in the external auditory canal
- protective, emollient, and bacteriocidal properties



- Since cerumen is naturally removed from the ear canals of most people, observation over time can be offered as reasonable management
- Residents at a privately owned intermediate care facility for the mentally retarded
  - 50% to 80% of their external canal occluded by cerumen without conductive hearing loss
  - no intervention and were examined after a year.
  - 44% had no cerumen
  - 53% still had the same amount but no conductive hearing loss
  - 3% progressed to impaction with associated hearing loss





## STATEMENT 3A

- NEED FOR INTERVENTION: Clinicians should treat cerumen impaction that causes symptoms expressed by the patient or prevents clinical examination when warranted



- Cerumen impaction may cause symptoms including itching and pain, discharge, ear fullness, cough, hearing loss, and tinnitus.
- There are strong data that indicate removal of impacted cerumen can improve hearing
- Older patients are often unaware that they have a cerumen impaction potentially impairing their hearing
  - In a random sample of 226 patients over the age of 65
  - 35% had cerumen impaction
  - after lavage and otoscopic confirmation of clearing, repeat hearing tests showed improved hearing at several frequencies



## STATEMENT 3B

- NEED FOR INTERVENTION IN SPECIAL POPULATIONS: Clinicians may distinguish and promptly evaluate the need for intervention in the patient who may not be able to express symptoms but presents with cerumen obstructing the ear canal



- Elderly patients, young children, and the cognitively impaired are at high risk for cerumen impaction
- may be unaware of it or unable to express the symptoms
- the hearing loss associated with cerumen impaction may further impair cognitive function



- A higher incidence of cerumen impaction in these populations is well documented.
  - may be related to the size of the external auditory canal in children
  - from changes in the skin of the external auditory canal in elderly patients



## STATEMENT 4

- HEARING AID USE: The clinician should examine patients with hearing aids for the presence of cerumen impaction during a healthcare encounter



- The normal self-cleaning process of cerumen can be disturbed by the presence of objects such as hearing aids or earplugs.
- Perry: stimulation of cerumen glands, leading to excessive cerumen production
- Therefore, hearing aid users are at increased risk for cerumen impaction.



- cerumen impaction can reduce the intensity of sound reaching the tympanic membrane by as much as 10 to 15 dB
- clinician should examine patients with hearing aids for impacted cerumen
- not need to occur more frequently than every three months





## STATEMENT 5A

- THERAPEUTIC INTERVENTIONS: Clinicians should treat the patient with cerumen impaction with an appropriate intervention, which may include one or more of the following: cerumenolytic agents, irrigation, or manual removal other than irrigation.



- In the symptomatic patient, the goal is to help alleviate or relieve the symptoms
- In the asymptomatic patient, the goal is to allow visualization of the ear canal and the tympanic membrane or perform audiometric or vestibular evaluations



- Cerumenolytic agents
  - disperse the cerumen
- Irrigation
  - flushing the wax out by a jet of warm water
- Manual removal
  - use of ear cures, probes, hooks, forceps, or microsuction



## STATEMENT 5B

- CERUMENOLYTIC AGENTS: Clinicians may use cerumenolytic agents (including water or saline solution) in the management of cerumen impaction



- Topical preparations exist in three forms: water-based; oil-based; and non-water-, non-oil-based
- Water-based agents have a cerumenolytic effect by inducing hydration and subsequent fragmentation of corneocytes
- Oil-based preparations lubricate and soften cerumen without disintegrating cerumen
- The mechanism by which non-oil-, non-water-based ear drops manage cerumen has not been defined



**Table 6**  
**Topical preparations (Hand 2004)<sup>75</sup>**

	Preparation	Active constituents
Water-based	Acetic acid	Aqueous acetic acid
	Cerumenex	Triethanolamine polypeptide oleate condensate
	Colace	Docusate sodium
	Hydrogen peroxide	Hydrogen peroxide solution
	Sodium bicarbonate	Sodium bicarbonate
	Sterile saline solution	Water
Oil-based	Almond oil	Almond oil
	Arachis oil	Arachis oil
	Earex	Arachis oil, almond oil, rectified camphor oil
	Olive oil	Olive oil
	Mineral oil/liquid petrolatum	Liquid petrolatum
Non-water-, non-oil-based	Audax	Choline salicylate, glycerine
	Debrox	Carbamide peroxide (urea-hydrogen peroxide)



- Cochrane review
  - no specific agent was superior to another and none were superior to either saline or water
- any type of cerumenolytic agent tends to be superior to no treatment but lacks evidence that any particular agent is superior to any other
- Use of a cerumenolytic improves success of irrigation



## STATEMENT 5C

- IRRIGATION: Clinicians  
may use irrigation in the management of  
cerumen impaction





- Aural irrigation is a widely practiced form of cerumen removal
- can be performed with a syringe or electronic irrigator
- pretreatment with an otic drop improves the efficacy of aural irrigation, regardless of solution type



- Hearing outcome: an average 5-dB increase in hearing after aural irrigation
- Complications: pain, injury to the skin of the ear canal with hemorrhage, and acute otitis externa, perforation and vertigo



- Ear syringing should not be performed in individuals who have had ear surgery or who have a non-intact tympanic membrane
- A higher incidence of malignant otitis externa is found among patients with diabetes following aural irrigation with tap water



## STATEMENT 5D

- MANUAL REMOVAL: Clinicians may use manual removal other than irrigation in the management of cerumen impaction.



- Advantages of manual removal
  - often quicker
  - direct visualization of the external auditory canal
  - does not expose the ear to moisture
- Instruments include a metal and plastic loop or spoon, alligator forceps, curette, right-angled hook, angulated suction tips, and a Jobson-Horne probe.



- *Harms*
- trauma to the external auditory canal
- perforation of the tympanic membrane
- infection
- suctioning may create a cooling effect and elicit a caloric response from the inner ear, causing nystagmus and vertigo.



## STATEMENT 6

- OUTCOMES ASSESSMENT:  
Clinicians should assess patients at the conclusion of in-office treatment of cerumen impaction and document the resolution of impaction. If the impaction is not resolved, the clinician should use additional treatment. If full or partial symptoms persist despite resolution of impaction, alternative diagnoses should be considered



- The symptoms of cerumen impaction include hearing loss, tinnitus, fullness, itching, otalgia, and occasionally cough.
- Outcome assessment requires
  - examination of the ear
  - patient assessment for symptom resolution
- post-treatment evaluation for is important for patient safety and medicolegal purposes
  - otitis externa, pain, dizziness, syncope, tinnitus, and tympanic membrane perforation





- The impaction is resolved when
  - clinician can examine the ear or perform the appropriate testing
  - associated symptoms have resolved
- If this first condition is met but symptoms persist, the clinician should consider alternative diagnoses



## STATEMENT 7

- PREVENTION: Clinicians may educate/counsel patients with cerumen impaction/excessive cerumen regarding control measures



- Measures that may be beneficial in reducing cerumen impaction include
  - prophylactic topical preparations
  - irrigating the ear canal
  - routine cleaning of the ear canal by a clinician
- Patients should be counseled not to insert foreign objects, such as cotton-tip swabs or bobby pins, into the ear canal



- preventive measures should be focused towards individuals who are at greatest risk for developing occlusion
  - elderly, cognitively impaired, narrowed or anatomically deformed ear canals
- Hearing aid users also have a higher incidence of impaction
  - overstimulation of cerumen production
  - impairment of normal cleaning mechanisms



# CONCLUSION

- clinicians should diagnose and treat cerumen impaction when an accumulation of cerumen is associated with symptoms, or prevents needed assessment of the ear
  - elderly patients, young children, and the cognitively impaired
  - hearing aid user
- cerumenolytic agents, irrigation, or manual removal
- outcome assessment



- Thanks for your attention.

