Cerumen Impaction: Diagnosis and Management

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Cerumen production is a normal and protective process for the ear canal. However, cerumen should be removed when it causes symptoms (e.g., hearing loss, itching, pain, tinnitus) or prevents assessment of the external auditory canal, the tympanic membrane, or audiovestibular system. Cerumen should also be removed when it limits examination in patients who cannot communicate their symptoms, such as those with dementia or developmental delay, nonverbal patients with behavioral changes, and young children with fever, speech delay, or parental concerns. Patients with coagulopathies, hepatic failure, thrombocytopenia, or hemophilia, and those taking antiplatelet or anticoagulant medications, should be counseled about the increased risk of bleeding in the external auditory canal when cerumen is removed. Effective treatment options include cerumenolytic agents, irrigation with or without cerumenolytic pretreatment, and manual removal. Home irrigation with a bulb syringe may be appropriate for selected adults. Cotton-tipped swabs, ear candling, and olive oil drops or sprays should be avoided. If multiple attempts to remove the impacted cerumen—including a combination of treatments—are ineffective, clinicians should refer the patient to an otolaryngologist. Persistent symptoms despite resolution of the impaction should also prompt further evaluation for an alternative diagnosis. (*Am Fam Physician*. 2018;98(8):525-529. Copyright © 2018 American Academy of Family Physicians.)

Cerumen, or earwax, is a combination of glandular secretions and desquamated epithelial cells that cleans, protects, and lubricates the external auditory canal.[1] Cerumen is typically expelled from the ear canal spontaneously via a self-cleaning mechanism that is assisted by jaw movement.[2] In some persons, however, this mechanism fails and cerumen becomes impacted. Cerumen impaction is defined as an accumulation of cerumen that causes symptoms or prevents assessment of the ear canal, tympanic membrane, or audiovestibular system; complete obstruction is not required.[3] Cerumen impaction is a common reason for consultation with primary care physicians and is present in about 10% of children, 5% of healthy adults, up to 57% of older persons in nursing homes, and one-third of patients with mental retardation.[1,4-6] Cerumen-related procedures accounted for nearly $50 million in Medicare spending in 2012.[6]

CME **This clinical content** conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 484.

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Patient information: A handout on this topic is available at https://www.aafp.org/afp/2007/0515/p1530.html.

Diagnosis

The diagnosis of cerumen impaction is made by direct visualization with an otoscope. Common symptoms include hearing loss, feeling of fullness in the ear, itching, otalgia, tinnitus, cough, and, rarely, a sensation of imbalance.[1,7] Hearing loss from cerumen impaction can cause reversible cognitive impairment in older persons.[8] Some patients are unable to accurately convey symptoms, such as those with dementia or developmental delay; nonverbal patients with behavioral changes; and young children with fever, speech delay, or parental concerns. In these patients, cerumen should be removed when it limits examination.[3,9,10]

A study of 819 children one month to 12 years of age presenting with upper respiratory infection or for a well-child visit examined whether cerumen affected the diagnosis of acute otitis media.[11] Approximately 50% of children with acute otitis media had cerumen impaction that prevented the initial diagnosis. Cerumen was removed by pediatricians in less than one-third of the children compared with almost all of the children evaluated by otolaryngologists when a final diagnosis of acute otitis media was made.

Cerumen in the ear canal can compromise auditory or vestibular testing and should therefore be removed before these tests are performed. Cerumen does not affect temperature measurement with an ear thermometer.[12]

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	References
Cerumen impaction should be treated when it causes symptoms such as hearing loss, itching, pain, or tinnitus, or when it prevents assessment of the external auditory canal, tympanic membrane, or audiovestibular system.	C	3
Cerumen should be removed when it limits examination in patients who cannot communicate their symptoms, such as those with dementia or developmental delay, nonverbal patients with behavioral changes, and young children with fever, speech delay, or parental concerns.	B	3, 8-10
Irrigation, cerumenolytic agents, and manual removal with instrumentation are effective treatments for cerumen impaction. There is not enough evidence supporting the superiority of one option over another.	B	3, 17, 18
Cotton-tipped swabs, ear candling, and olive oil drops or sprays should not be used to remove cerumen because they are ineffective and have potential adverse effects.	C	3, 20, 27

A = consistent, good-quality patient-oriented evidence; **B** = inconsistent or limited-quality patient-oriented evidence; **C** = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to https://www.aafp.org/afpsort.

Modifying Factors

Patients with coagulopathies, hepatic failure, thrombocytopenia, or hemophilia and those taking antiplatelet or anticoagulant medications should be counseled about the increased risk of bleeding in the external auditory canal when cerumen is removed. Clinicians should avoid traumatic irrigation or traumatic manual removal in these patients, or refer them to a subspecialist. Immunocompromised patients and those with uncontrolled diabetes mellitus are at increased risk of postprocedural otitis externa, especially when irrigation is performed. Malignant otitis externa, a potentially life-threatening external auditory canal infection that spreads rapidly to the surrounding tissues and bones, has been reported with the use of tap water irrigation. If irrigation is performed in at-risk patients, they should be counseled to follow up promptly if they develop fever, ear pain, or discharge.[13-15]

Patients with a history of head and neck radiation may have drier cerumen and require more careful debridement, because injury to the ear canal may evolve into osteoradionecrosis of the external auditory canal or temporal bone.[3] The presence of dermatologic conditions, such as eczema, seborrheic dermatitis, and ectodermal dysplasia, can increase the frequency of impaction and the risk of otitis externa.[16] Anatomic challenges, such as narrowing of the ear canal, congenital or acquired stenosis, diffuse exostoses, and solitary osteomas (bony projections into the ear canal), can make irrigation or manual instrumentation difficult and can increase the risk of otitis externa. Microscope-assisted mechanical removal of cerumen is the preferred technique in patients with a perforated tympanic membrane or who have a patent tympanostomy tube.

Management

No intervention is required for cerumen that does not meet the definition of impaction, except in patients who cannot report their symptoms and who have a significant amount of cerumen that impairs examination. Three options are widely used to treat cerumen impaction: irrigation, cerumenolytic agents, and manual removal with instrumentation.[3] A 2010 systematic review determined that cerumen softening by any agent was more effective than no softening.[17] Another systematic review found weak evidence that using a cerumenolytic agent alone or before irrigation was more beneficial than no treatment or irrigation alone.[18] Symptoms and the ear canal should be reassessed after the first attempt. If the impaction is not resolved, additional treatments should be attempted. If the impaction is resolved but symptoms persist, an alternative diagnosis should be considered.

CERUMENOLYTIC AGENTS

Cerumenolytic agents are commonly used alone or in combination with irrigation or manual instrumentation to remove impacted cerumen. Topical preparations are available in three forms: water-based, oil-based, and non–water- or oil-based *(Table 1)*.[19,20] Based on low- to moderate-quality studies, a 2009 Cochrane review concluded that using ear drops is better than no treatment, but it is unknown whether any formulation is superior.[21] Although ear drops have the advantage of easy application and no risk of mechanical damage, some may cause ear canal irritation or contact dermatitis. Clinicians should ensure that the patient has no history of allergies to any of the components. Ear drops should be close to body temperature to avoid caloric effects (vertigo), and should not be used if there is a possibility that the tympanic membrane is not intact, if a patent tympanostomy tube is present, or if the ear canal is infected.[3]

TABLE 1

Cerumen-Softening Agents for Cerumen Removal

Agent	Use	Dosing	Comment
Water-based			
Acetic acid, 2.5%	Home treatment of impacted cerumen	Fill affected ear with 2 to 3 mL twice daily for up to 14 days	More effective in children than in adults
Docusate sodium	Soften cerumen before irrigation	Fill affected ear canal with 1 mL 15 to 30 minutes before irrigation	In one study, one-fifth of tympanic membranes were visualized without irrigation
Hydrogen peroxide, 3%	Soften cerumen before irrigation	Fill affected ear canal 15 to 30 minutes before irrigation	If not completely removed, bubbling may interfere with ability to visualize tympanic membrane
Sodium bicarbonate, 10%	Soften cerumen before irrigation or as an alternative to irrigation	Fill affected ear with 2 to 3 mL 15 to 30 minutes before irrigation, or alternatively for three to 14 days at home with or without irrigation	More effective in children than in adults
Triethanolamine polypeptide oleate condensate, 10%	Soften cerumen before irrigation	Fill affected ear canal 15 to 30 minutes before irrigation	Can be irritating to the ear canal and should not be used for a prolonged period
Water or saline	Soften cerumen before irrigation	If irrigation is attempted without softening and is ineffective after the first attempt, instill water and wait 15 minutes before repeating irrigation	—
Non–water- or oil-based			
Carbamide peroxide (Debrox)	Soften cerumen before irrigation or as an alternative to irrigation	Put five to 10 drops into the affected ear twice daily for up to seven days	—
Choline salicylate plus glycerol (e.g., Earex Advance); ethylene oxide polyoxypropylene glycol (Addax); propylene glycol; chlorbutol, 0.5%	Soften cerumen before irrigation or as an alternative to irrigation	Put three drops into the affected ear twice daily for four days	Not all brands and formulations are available in the United States
Oil-based			
Almond, arachis, or rectified camphor oil (e.g., Otocerol, Earex)	Soften cerumen before irrigation or as an alternative to irrigation	Put four drops into the affected ear twice daily for up to four days	Not all brands and formulations are available in the United States
Almond or mineral oil	Soften cerumen before irrigation	Put three drops into the affected ear at bedtime for three or four days	—
Arachis oil, 57%; chlorbutol, 5%; paradichlorobenzene, 2%, and turpentine oil, 10% (e.g., Cerumol)	Soften cerumen before irrigation or as an alternative to irrigation	Fill affected ear with 5 mL twice daily for two or three days	Not all brands and formulations are available in the United States

Adapted with permission from McCarter DF, Courtney AU, Pollart SM. Cerumen impaction. Am Fam Physician. *2007;75(10):1526, with additional information from reference 20.*

IRRIGATION

Irrigation can be attempted alone or with cerumenolytic pretreatment. Before performing aural irrigation, it is important to obtain a detailed history and to view the tympanic membrane and external auditory canal to ensure that the membrane is intact, that no patent tympanostomy tubes are present, and that there are no anatomic abnormalities. There are several irrigation techniques using syringes or electronic irrigators, and although none has been proven superior, manual irrigation with a syringe is most often used.[3] Gentle upward and backward traction should be placed on the external ear to help straighten the external auditory canal. The water should be close to body temperature and instilled gently to avoid trauma, bleeding, and pain. The canal should be checked intermittently for clearance of the cerumen and potential complications, such as pain, skin injury with or without hemorrhage, or acute otitis externa. Major complications such as tympanic membrane perforation and vertigo are rare, occurring in approximately one in 1,000 ears syringed.[22] To reduce the risk of infection, a 50/50 mixture of vinegar and isopropyl alcohol can be instilled after treatment.[13]

In a randomized trial of 237 adults with symptomatic cerumen impaction, those who received cerumenolytic drops and instructions for home irrigation with a bulb syringe had similar outcomes and satisfaction as those who received in-office irrigation by a primary care clinician.[23] However, it is unclear if these results are generalizable to all patients with cerumen impaction, particularly children and others who are unable to accurately convey symptoms. Jet irrigators should not be used for self-treatment because of the risk of damage to ear structures.[22]

MANUAL REMOVAL WITH INSTRUMENTATION

Manual removal of cerumen is the preferred technique in patients with abnormal ear canal anatomy, a history of ear surgery, systemic illnesses that increase the risk of infection, or a nonintact tympanic membrane. To minimize the risk of trauma, a cooperative patient and greater clinical skill than for other removal methods are required.[24] Manual removal is often quicker, involves the use of a metal or plastic loop or spoon, and allows direct visualization via a handheld otoscope or binocular microscope.

Patient Education

The 2017 guideline on cerumen impaction by the American Academy of Otolaryngology–Head and Neck Surgery Foundation, endorsed by the American Academy of Family Physicians, recommends that clinicians provide counseling on proper ear hygiene, especially to patients with cerumen impaction and those who are particularly susceptible, such as children, older adults, and patients who use hearing aids or have cognitive impairment.[3,19,25] Education should focus on behaviors that promote safe and effective ear hygiene *(Table 2[3])* while minimizing self-inflicted harm, such as abrasions, cuts, tympanic membrane perforation, and cerumen impaction due to manipulation.[26]

Although cleaning the outer ear is acceptable once cerumen is visible, patients should not insert foreign bodies into the ear canal, including cotton-tipped swabs and candles.[3] Ear candling consists of lighting one end of a hollow candle and placing the other end in the ear canal. It is thought that the flame creates negative pressure, drawing wax and debris out of the ear. However, this method has potential adverse effects and is ineffective.[27] Similarly, regular use of olive oil drops or spray is ineffective and should not be recommended.[20] Successful and safe self-help measures include cerumen-softening drops or home irrigation kits.[28] Persons who use hearing aids should follow cleaning recommendations from the manufacturer and have ear canal checks every three to six months, because these devices increase cerumen production and disrupt external migration.[29]

Referral

If multiple attempts to remove the impacted cerumen, including a combination of treatments, are ineffective, clinicians should refer the patient to an otolaryngologist. Referral should also be considered for patients who experience pain or vertigo during the removal attempt or who have a swollen ear canal, unusual anatomy, or a history of

TABLE 2

Options to Help Reduce Cerumen

Secondary prevention
Alcohol or hydrogen peroxide drops or irrigation
Checking of the ear canal for cerumen by clinician in patients with hearing aids
Irrigation with bulb syringe or irrigation kits
Physical removal of cerumen by clinician
Topical cerumen-softening agents
Not advised
Ear candling
Olive oil drops or spray
Probing ears with foreign objects (e.g., cotton-tipped swabs, pens/pen tops, paper clips)

Adapted with permission from Schwartz SR, Magit AE, Rosenfeld RM, et al. Clinical practice guideline (update): earwax (cerumen impaction) [published correction appears in Otolaryngol Head Neck Surg. *2017;157(3):539].* Otolaryngol Head Neck Surg. *2017; 156(1 suppl):S25.*

tympanic membrane perforation, head and neck radiation, or previous ear surgery.[24] Persistent symptoms despite successful removal of the cerumen impaction should also prompt referral if the etiology of symptoms is not clear.

This article updates a previous article on this topic by McCarter, et al.[19]

Data Sources: A PubMed search was completed in Clinical Queries using the key terms cerumen, cerumen impaction, earwax, earwax removal, and ear canal irrigation. The search included meta-analyses, randomized controlled trials, clinical trials, and reviews. Searches were also performed on the National Institute for Health and Care Evidence website, Essential Evidence Plus, Clinical Evidence, and the Cochrane Database of Systematic Reviews. Search dates: November 18 to 24, 2017, and July 14, 2018.

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