College of Registered Nurses of Saskatchewan

Ceruminosis (Impacted Cerumen): Adult & Pediatric

Ears, Eyes, Nose, Throat and Mouth

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

Effective Date: May 4, 2022

Background

Cerumen is produced naturally in the ear canal and is normally cleared by the body's own mechanisms but occasionally it is produced in excessive amounts and partially or totally occludes the ear canal (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Ceruminosis is a partial or complete occlusion of the ear canal with wax (cerumen) that results in symptoms or prevents assessment of the ear canal, tympanic membrane (TM), or audiovestibular system (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017). Cerumen impaction occurs when the self-cleaning mechanism fails and cerumen accumulates in the external auditory canal (Dynamed 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Immediate Consultation Requirements

The RN(AAP) must seek immediate consultation from a physician/NP when any of the following circumstances exist:

- unusual anatomy,
- bleeding from ear,
- foreign body in the ear canal, and/or
- hearing loss (Interprofessional Advisory Group [IPAG], personal communication, August 28, 2019).

Predisposing and Risk Factors

Predisposing and risk factors for ceruminosis include:

- narrow ear canals,
- hairy ear canals,
- individuals who use in-ear hearing aids,

- frequent use of earphones,
- cotton swab use causing further impaction,
- osteomata: a benign bony growth in the external ear canal,
- use of in-ear hearing protection,
- drier cerumen production or overproduction,
- recurrent otitis externa,
- elderly clients,
- client with cognitive impairments, and/or
- skin disease of periauricular area or scalp (e.g., eczema, seborrheic dermatitis) (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Health History and Physical Exam

Subjective Findings

The circumstances of the presenting complaint should be determined. These include:

- conductive hearing loss;
- ear pain/discomfort;
- sensation of fullness;
- itching;
- tinnitus;
- vertigo; and/or
- chronic cough, related to pressure on the vagus nerve (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

The RN(AAP) should enquire about the use of anticoagulant therapy, diabetes mellitus, immunocompromised state, and/or keratosis obturans. These clients are at higher risk for bleeding in the external auditory canal or post-procedural otitis externa when cerumen is removed (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Objective Findings

The signs and symptoms of ceruminosis may include the following:

- hardened wax in the ear canal,
- complete or partial obstruction of the ear canal,
- red and swollen ear canal,
- obscured TM, or
- decreased hearing (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Differential Diagnosis

The following should be considered as part of the differential diagnosis:

- foreign body in the external ear canal,

- otitis externa,
- keratosis obturans (build-up of keratin in the external ear canal). Keratosis obturans is more commonly seen in younger clients and is rare (especially in Western countries), but people may present with bilateral accumulation of large plugs of desquamated keratin in the ear canal, acute onset of severe pain (most common presenting symptom), conductive hearing loss, or rarely, otorrhea (Dynamed, 2018; Zwemstra, Ebbens, de Wolf, & van Spronsen, 2021).

Making the Diagnosis

The diagnosis is based on history and physical findings and direct visualization of impacted cerumen.

Investigations and Diagnostic Tests

Investigations and diagnostic tests are not required.

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to remove cerumen, treat any underlying canal irritation, and prevent recurrence (Dynamed, 2018; Michaudet & Malaty, 2018 Schwartz, et al., 2017).

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, non-pharmacological options including:

Non-pharmacological Cerumenolytic Agents

These are used to soften cerumen before irrigation, or as an alternative to irrigation, and include:

- normal saline 0.9%:
  - instill into affected ear canal 15 to 30 minutes before irrigation.
- olive oil:
  - instill three drops into affected ear canal at bedtime for three to four days,
  - the use of vegetable oils for wax removal may result in a foul smell (Michaudet & Malaty, 2018; Schwartz et al., 2017). Cerumenolytic agents are contraindicated if the TM is perforated, an intact TM cannot be confirmed, patent tympanostomy tubes are present, or if there is an acute ear canal infection (Dynamed, 2018; Michaudet & Malaty, 2018; Schwartz et al., 2017).

Ear Canal Irrigation

Prior to ear canal irrigation the cerumen should be softened with a commercially prepared agent or olive oil for three to four days. If the client has symptoms such as pain or vertigo, and same-day irrigation is required, soften wax with alternative agents such as hydrogen peroxide, normal saline, or docusate sodium. Do not perform ear irrigation in young children with ear wax or

uncooperative clients at any age (Michaudet & Malaty, 2018; Schwartz et al., 2017).

Contraindications to irrigation include:

- obstruction of the ear canal by a vegetable foreign body (e.g., pea, bean, or corn kernel);
- presence of a cold, fever, or known ear infection;
- unknown injury or perforation of the TM;
- history of ear surgery;
- if previous irrigations caused pain; or
- if the client is known to have anatomic abnormalities such as congenital malformations, exostosis, scar tissue, or chronic otitis externa (Michaudet & Malaty, (2018); Schwartz et al., 2017).

Irrigation should be performed as follows:

1. Position client with head tilted toward the side of the affected ear.
2. Clean the pinna and opening of the external ear canal with normal saline.
3. Fill the irrigating syringe with warmed normal saline. Use an irrigating syringe or a 60 mL luer lock syringe and a 16-gauge IV catheter with the needle removed.
4. Straighten the ear canal by pulling the pinna up and back in adults and down and back in pediatrics.
5. Place the tip of the catheter at the opening of the ear canal. Direct a steady, slow stream of solution against the roof of the ear canal. Allow the solution to flow out freely. Continue until the cerumen is removed or the client expresses dizziness or discomfort.
6. Reassess external ear canal to assess for resolution of the condition and the TM (Stephenson et al., 2019).

Manual Cerumen Removal with Instrumentation

Manual removal should be done by a physician/NP, or RN where employer policy permits or as contained in an applicable RN Clinical Protocol within RN Specialty Practices.

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of ceruminosis impacted cerumen are in accordance with the *Cerumen Impaction: Diagnosis and Management* (Michaudet & Malaty, 2018), *Cerumol* (Paladin Labs, n.d.), and *Clinical Practice Guideline (update): Earwax (cerumen impaction)* (Schwartz et al., 2017).

Pharmacological Cerumenolytic Agents

These agents are contraindicated if TM is perforated, an intact TM cannot be confirmed, patent tympanostomy tubes are present, or active ear canal infection.

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 12 years of age) and Adult					
	Commercially- prepared agents (e.g., Cerumol) (contraindicated in peanut allergy)	instill 5 drops to affected ear canal	topical	b.i.d.-t.i.d.	3 days
OR	Docusate sodium pediatric syrup (provide dropper)	instill 1 mL into the affected ear canal	topical	15 to 30 minutes before irrigation	n/a

Client and Caregiver Education

The RN(AAP) provides client and caregiver education:

- Counsel about the appropriate use of medications (dose, frequency, compliance, etc.).
- Explain disease course and expected outcome.
- Advise that a small amount of bleeding is common post procedure.
- If asymptomatic, advise that cerumen does not need to be removed as it has a protective, emollient, and bactericidal properties.
- Suggest avoiding the use of cotton swabs.
- Educate about prevention by instilling one or two drops of mineral oil/olive oil/ almond oil or warm water into the ear canal once or twice per week, which may decrease the recurrence of cerumen impaction.
- Avoid ear candling as it is not recommended due to safety concerns and a lack of proven efficacy (Schwartz et al., 2017).

Monitoring and Follow-Up

The RN(AAP) should advise the client to return to clinic in three days if they are immunocompromised or if symptoms persist. Immunocompromised clients should monitor for fever, ear pain, or discharge, and seek immediate care if present (Michaudet & Malaty, 2018).

Complications

The following complications may be associated with ceruminosis:

- hearing loss;
- bleeding or trauma to the external ear canal;
- vertigo;
- otitis externa;
- perforation of TM;
- vasovagal response with irrigation of the ear;

- chronic cough may result due to the irritation of the vagus nerve which innervates the external auditory canal;
- tinnitus; and
- social withdrawal, poor work performance, and mild paranoia associated with hearing loss (Michaudet & Malaty, 2018; Schwartz et al., 2017).

Referral

Refer to a physician/NP if the client presentation is consistent with:

- the *Immediate Consultation Requirements* section;
- client does not respond to treatment;
- pain persists after two removal attempts (with second attempt preceded by two to three days with oil preparation);
- history of TM perforation, radiation, or surgery;
- vertigo or severe pain develops during irrigation with water at body temperature (perilymphatic fistula or perforation of oval window may be suspected);
- hearing loss persists after removal of cerumen (IPAG, personal communication August 28, 2019; Michaudet & Malaty, 2018; Schwartz et al., 2017).

References

Dynamed. (2018). *Cerumen impaction.* https://www.dynamed.com/condition/cerumen-impaction#GUID-ECC25086-3BE0-41D0-96DE-88303D6F4D6E

Michaudet, C., & Malaty, J. (2018). Cerumen impaction: Diagnosis and management. A*merican Family Physician, 98*(8), 525-529. www.aafp.org/afp

Paladin Labs. (n.d.). *Cerumol*. http://www.paladin-labs.com/our_products/Cerumol_Insert_En.pdf

Schwartz, S. R., Magit, A. E., Rosenfeld, R. M., Ballachanda, B. B., Hackell, J. M., Krouse, H. J., Lawlor, C. M., Lin, K., Parham, K., Stutz, D. R., Walsh, S., Woodson, E. A., Yanagisawa, K., & Cunningham, E. R. (2017). Clinical practice guideline (Update): Earwax (cerumen impaction). *Otolaryngology–Head and Neck Surgery*, *156*(1_suppl), S1–S29. https://doi.org/10.1177/0194599816671491

Stephenson, B., Bruce, J., Verville, F., Giebel, S., Miller, L., & Duff, E. (2019). *Advanced procedural skills.* https://pcnp.pressbooks.com/

Zwemstra, M., Ebbens, F., de Wolf, M. & van Spronsen, E. (2021). A novel topical treatment for keratosis obturans. *Otology & Neurotology, 42* (10), e1503-e1506. doi: 10.1097/MAO.0000000000003301.