SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE
CLINICAL DECISION TOOL
DECEMBER 1, 2016

OTITIS EXTERNA ADULT

DEFINITION

Otitis externa (OE) is the inflammation of the ear canal lining which presents in two forms:

1. A benign painful infection of the outer canal. This is most common and can occur in all age groups.
2. Malignant (necrotizing) OE: A potentially lethal form that usually occurs in immunocompromised or diabetic clients. It involves bacterial spread to the cartilage of the external ear with pain and edema. It may be accompanied by a fever and systemic manifestations of infection.

OE is also called swimmer's ear, tropical ear, or external ear infection.

IMMEDIATE CONSULTATION REQUIRED IN THE FOLLOWING SITUATIONS

- Fever > 39°C oral
- Extensive cervical lymphadenopathy
- Mastoid process erythema, tenderness, swelling with fever, protrusion of pinna
- Facial nerve palsy
- Suspicion of malignant OE
- Initial therapy failure or recurrence
- Local cellulitis
- Parotitis
- Vertigo

Types:

Acute

- Usually due to bacterial infection (swimmer's ear)
- Most common
- Sterile canal or Staphylococcus
- Severe infection could be due to Pseudomonas infection

Chronic

- Lasting > 3 months
- Usually fungal or allergic in origin
- May be manifestation of dermatitis
- May result from incomplete resolution of acute form

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Localized

- Due to folliculitis or furuncle in external ear canal
- Occurs usually in outer third of canal

Diffuse OE

- Due to a more widespread inflammation of the skin and subdermis of the external ear canal

Malignant OE

- Also called malignant external otitis, necrotizing external otitis, necrotizing OE, or osteomyelitis of ear canal
- Extends beyond the external auditory canal and may include the mastoid bone, cranial nerves (facial nerve with glossopharyngeal and less often spinal accessory nerves), parotid gland, paranasal sinuses, vein, or meninges. *Pseudomonas aeruginosa* (*P. aeruginosa)* is usually the organism involved.

CAUSES

A disruption of the skin or cerumen protective barrier in the external ear canal leads to OE.

Acute OE

- Gram-negative rods: Proteus, Pseudomonas
- Gram-positive cocci (less common): Staphlylococcus, Streptococcus
- Fungal infection (e.g., Aspergillus and Candida)

Chronic OE

- Inadequate treatment of acute form
- Allergic contact dermatitis
- Seborrheic dermatitis
- Food sensitivity associated with atopic dermatitis
- Systemic dermatitis
- Generalized skin conditions (atopic dermatitis/eczema, psoriasis)
- Variants of chronic OE
- Type IV cell-mediated hypersensitivity reaction to ototopical treatment of acute form

- Dermatophytid eruptions caused by hematogenous spread of fungal by-products from primary site to external ear

Localized OE

- Typically caused by infection of hair follicle by *Staphylococcus aureus (S. aureus)*

Malignant OE

- *P. aeruginosa*
- *S. aureus*
- Proteus species
- Klebsiella

PREDISPOSING AND RISK FACTORS

- Hearing aids
- Narrow ear canal
- More common in women than in men
- Use of cotton-tipped applicators
- Use of ear plugs
- Swimming
- Excessive bathing
- Histiocytosis
- Immunocompromised conditions

Likely risk factors:
Activities/conditions that introduce irritation, trauma, or infectious agent:

- Prolonged swimming
- Hearing aids
- Impacted cerumen
- Insufficient cerumen
- Microtrauma secondary to ear cleaning

Conditions that disrupt epithelium of the skin canal such as:

- Seborrheic dermatitis
- Eczema
- Psoriasis

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Possible risk factors:

- High humidity
- Warmer temperatures
- Exposure to water high in bacterial counts
- Chronic dermatologic conditions
- Maceration of skin
- Sweating
- Allergy
- Stress
- Anatomic abnormalities (narrow canal or exostoses) may predispose client to acute OE
- Previous ear surgery (such as tympanostomy)

Risk factors for malignant OE:

- Diabetes
- Immunocompromised state
- Radiation therapy to head and neck

HISTORY

- Ear pain (otalgia)
- Pruritus or irritation
- Purulent discharge from canal (cheesy white, greenish blue or grey)
- Recent exposure to water or mechanical trauma
- Reduced hearing or feelings of fullness in the ear may be present
- Unilateral headache may be present
- Erythema
- Edema
- Tinnitus
- Jaw pain
- Facial paralysis, vertigo, meningeal signs (such as headache) may be present in malignant external otitis
- 90% of cases are unilateral

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PHYSICAL FINDINGS

- Temperature may be > 39°C oral in malignant OE but this is not common in acute OE.
- Pain with pinna/tragus manipulation or pressure may be used to differentiate OE from acute otitis media with otorrhea.
- Regional cellulitis of auricle, pinna, and adjacent skin may be present in some clients.
- Necrosis or granulation of canal skin in malignant OE.
- Look for other dermatologic manifestations (such as eczema, psoriasis, etc.).

Acute forms may have:

- Ear canal edema, erythema, or both
- Erythema of tympanic membrane
- Canal obstruction
- Aural discharge may occur and may be serous or purulent
- Auricular cellulitis
- Parotitis
- Enlarged cervical lymph nodes

Chronic forms may have:

- Erythema of external canal
- Lichenification of skin of external canal
- Whitish cotton-like strands in the canal (with or without black or white fungal balls) with fungal infections
- Canal appearance of "wet newspaper" with grey or slightly black colour
- Check for tympanic membrane integrity
- Discomfort and pain, if present, is usually mild
- Ear manipulation may be painful, especially pressure on tragus or movement of auricle
- Cervical lymphadenopathy may be present with severe disease and extra-canal manifestations

Localized OE may have:

- Initially a red swelling in the canal which may progress into an abscess, which may occlude the ear canal

DIFFERENTIAL DIAGNOSIS

- Acute otitis media with perforation
- Chronic suppurative otitis media
- Skin condition involving the ear (e.g., eczema)
- Mastoiditis
- Furuncle in the canal
- Foreign body irritation
- Ear damage due to radiation treatment
- Acute mastoiditis
- Carcinoma of the external auditory canal
- Ramsay Hunt syndrome
- Apocrine hidrocystoma of external auditory canal
- Bullous myringitis

COMPLICATIONS

- Ear canal narrowing
- Tympanic membrane perforation
- Conductive hearing loss
- Extracanalicular dissemination of infection (auricular cellulitis, chondritis, parotitis, adenopathy)
- Opportunistic bacterial or fungal infection may complicate chronic OE
- Fungal involvement is uncommon in primary OE but may be more common in chronic OE or after treatment with topical antibiotics (or less often, systemic antibiotics).
- Furuncle
- Regional lymphadenitis
- Progression to malignant OE may rarely lead to osteomyelitis of ear canal, perichondritis, or bacterial meningitis.
- External auditory canal cholesteatoma

- Mastoiditis

INVESTIGATIONS AND DIAGNOSTIC TESTS

Otoscopy

- Will reveal diffuse ear canal edema, erythema, or both, with or without otorrhea or material in ear canal

Pneumatic otoscopy findings

- Good tympanic membrane mobility with acute OE
- Absent or limited mobility with acute otitis media and associated middle-ear effusion

Tympanometry findings

- Normal peaked curve with acute OE
- Flat tracing with acute otitis media

Culture of the ear canal can identify fungi, resistant bacteria, or unusual causes of infection. Testing is usually unnecessary.

MAKING THE DIAGNOSIS

Criteria for diagnosis of acute OE:

- Rapid onset (usually within 48 hours) in past 3 weeks
- Symptoms of ear canal inflammation:
  - Otalgia severity may vary from mild to severe
  - Itching
  - Fullness
  - May or may not have hearing loss or jaw pain
- Signs of ear canal inflammation:
  - Tenderness of tragus and/or pinna
  - Diffuse ear canal edema and/or erythema
  - May or may not have otorrhea, regional lymphadenitis, tympanic membrane erythema, or cellulitis of pinna and adjacent skin
- Consider malignant OE if:
  - Presence of severe OE
  - Intractable otalgia and/or headache

- Pain and tenderness near ear and mastoid
- Persistent discharge from ear
- Client has known or suspected immunocompromised status
- Facial nerve palsy
- Granulation tissue at junction of bone and cartilage in external ear

Rule out:

- Unusual causes of OE
  - Viral infections of external ear
  - Otomycosis (fungal infection of external ear)
  - Contact dermatitis of ear canal (may be cause of chronic OE)
- Otitis media
  - Acute otitis media
  - Chronic suppurative otitis media
  - Otitis media in clients with perforation or tympanostomy tubes
- Foreign body in external ear
- Furunculosis
- Ear damage due to radiation therapy (may involve pinna, external canal, and periauricular region)
- Acute mastoiditis
- Carcinoma of external auditory canal
- Ramsay Hunt syndrome
- Malignant OE
- Apocrine hidrocystoma of external auditory canal

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Relieve pain
- Prevent recurrence
- Eradicate infection

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Appropriate Consultation

- Consult a physician/RN(NP) for severe OE that requires systemic antibiotic treatment and in those who are immunocompromised.
- When the presence of ear wax or debris obstruct penetration of topical medication
- Clients with signs and symptoms of malignant OE

Non-Pharmacological Interventions

- Debriding the canal is critical. The importance of this step cannot be overemphasized.
- Clean the outer ear and the canal with normal saline and gently debride the area of debris and exudate with a gauze wick.
- If there is significant drainage or if there is threat of further narrowing, an ear wick (1 inch [2.5 cm] of cotton or gauze) threaded gently into the canal and left there will help keep the canal open and ensure that medicated drops reach the distal part of the canal.
- The wick will eventually fall out as edema subsides or can be removed after 2-3 days.
- Remove any aggravating or precipitating factors.

Pharmacological Interventions

- A combination of antibiotic drops with 3% acetic acid and steroid is more effective than using individual agents alone for treating OE.
- Ear wicks may be necessary in swollen canals for the penetration of medicine into the canal. If an ear wick is used:
  - Remove after 48 hours and inspect canal
  - Replace wick if canal is still significantly narrowed
  - Wick is no longer necessary when canal has returned to almost normal size

Duration of Treatment:

- Analgesia for several days may be necessary
- Antibiotic/antiseptic treatment for 7-10 days

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Manage pain with simple analgesics:

- Ibuprofen (Motrin) 400-600 mg orally q8h prn (maximum dose 3.2 g/day)
  Or
- Acetaminophen (Tylenol) 500-1000 mg orally q4-6h prn (maximum dose 4 g/day)

As OE can be very painful, stronger analgesia may be necessary if acetaminophen or ibuprofen is unable to control the pain.

OE (Acute Uncomplicated):

- If there is no danger of perforated tympanic membrane, start:
  - Gramicidin/polymyxin (Optimyxin) eye/ear solution 4 drops qid for 7 days
- If the tympanic membrane cannot be visualized or is perforated:
  - Ciprofloxacin/dexamethasone (Ciprodex) otic solution 4 drops bid for 7 days

For recurrent episode, start the client on prophylactic measures:

- A solution of 3% acetic acid (mix 100 mL of white vinegar and 45 mL of water) 2-3 drops to the affected ear after swimming or showers

Fungal OE (Otomycosis):
Antibiotic eardrops may worsen symptoms of fungal OE.

- Fungal organisms can cause OE especially in immunocompromised clients. The following antifungal agents can be used in mild to moderate cases of OE **but only if** the tympanic membrane is intact.
  - In mild to moderate cases of OE due to fungi, treat with antifungal agents:
    - Clotrimazole 1% cream bid for 7 days
      Or
    - Locacorten Vioform otic drops 2 drops bid for 7 days
- Canal should be kept free of water for at least 2 weeks.
- Canal debridement is necessary at times for resolution of infection.
- Daily meticulous irrigation with 3% acetic acid.

Client and Caregiver Education

- Counsel client/caregiver about the appropriate use of medications (if possible, have another family member instill drops and clean the ear).
- Counsel client/caregiver about proper ear hygiene before instilling medications.
- Advise client/caregiver about preventing recurrent irritation (e.g., client should not use cotton-tipped applicators in the ears).
- Recommend proper drying of ears after swimming or the use of ear plugs while swimming, bathing, or showering.
- Counsel client/caregiver about proper hygiene of hearing aids and ear plugs.
- Keep ear dry and avoid water sports for 7-10 days.
- Limit use of ear phones and hearing aids until after pain and discharge has cleared.
- Cut nails short for clients with eczema to minimize trauma.

Monitoring and Follow-Up

- If client fails to respond to initial therapeutic option within 48-72 hours, reassess the client to confirm the diagnosis of acute OE and to rule out other causes of illness.
- Consider at least one follow-up visit to verify resolution and clear remaining debris from canal for all but mild cases.
- Instruct client to return if pain increases or if fever develops despite therapy.
- If an ear wick is used, remove after 24-48 hours and reassess.

Referral

- Refer to a physician/RN(NP) if treatment fails.

DOCUMENTATION

- As per employer policy

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