

For the Primer, visit [doi:10.1038/nrdp.2016.63](https://doi.org/10.1038/nrdp.2016.63)

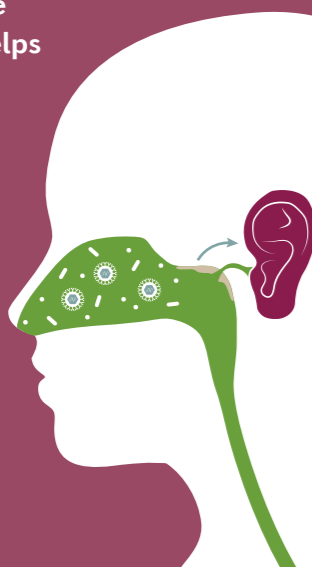
➔ **Otitis media (OM)** or inflammation of the middle ear is an umbrella term that encapsulates acute OM (AOM), OM with effusion (OME or 'glue ear') and chronic suppurative OM (CSOM). These conditions are closely related and can overlap.

EPIDEMIOLOGY

OM is one of the most common diseases in young children worldwide. The total annual number of new AOM episodes is 709 million; its incidence peaks in the first year of life. By contrast, the incidence of OME is difficult to capture given that it can be asymptomatic, but is estimated to affect 20% of children. The annual number of new CSOM episodes has been estimated at 31 million.

MECHANISMS

OM can be of bacterial or viral origin. Following an upper respiratory tract infection, the inflamed and dysfunctional Eustachian tube and the negative middle ear pressure allow the viruses and bacterial otopathogens that colonize the nasopharynx to ascend to the middle ear. The Eustachian tube anatomy in the young child helps facilitate this process. The middle ear inflammation and fluid accumulation may resolve, or the fluid persists, or becomes a chronic disease.



DIAGNOSIS

Diagnosis depends on clinical signs and symptoms; diagnostic modalities include (pneumatic) otoscopy, tympanometry and audiometry

CSOM is defined as chronic inflammation of the middle ear and mastoid cavity; persistent or recurrent ear discharge through a tympanic membrane perforation or a ventilation (tympanostomy) tube is the most prominent symptom

AOM is characterized by the presence of fluid in the middle ear (middle ear effusion (MEE)), acute infection of the middle ear and bulging of the tympanic membrane, often with considerable ear pain

OME is characterized by MEE without signs of acute infection; the main symptom is hearing loss

⚡ Although AOM often resolves spontaneously without complications, it can rarely be associated with hearing loss and life-long sequelae. Suppurative (pus-forming) complications of AOM are rare but serious. Approximately 21,000 people die from complications of OM every year.

OUTLOOK

AOM tends to be overdiagnosed and OME tends to be underdiagnosed owing to difficulties of confirming MEE. With growing concerns about antimicrobial resistance, research should focus on further reduction in antibiotic use in OM by improving its diagnosis and implementation of guidelines. A better understanding of OM pathophysiology is also necessary to develop novel preventative and therapeutic approaches.

QUALITY OF LIFE

Problems with language, communication and social engagement due to hearing loss, rather than health symptoms, are a major concern for OME. rAOM severely impacts the quality of life of the patient as well as the caregivers.

! The economic burden of OM is high, for example, estimated at US\$5 billion annually in the United States

Rx MANAGEMENT

Symptomatic management of ear pain and fever is the mainstay of AOM treatment, reserving antibiotics for children with severe, persistent or recurrent infections. Management of OME largely consists of watchful waiting, with ventilation tubes primarily for children with chronic effusions and hearing loss, developmental delays or learning difficulties. Insertion of ventilation tubes and adenoidectomy are common operations for recurrent AOM (rAOM) to prevent recurrences, but their effectiveness is still debated. Topical antibiotic (quinolone) treatment is recommended for CSOM.



PREVENTION

Vaccination against bacterial otopathogens reduces the risk of developing OM. The introduction of pneumococcal conjugate vaccine in 2000 in the United States and most European countries has reduced the incidence of AOM associated with the serotypes covered by the vaccine and overall AOM incidence. Improvement of the pneumococcal vaccine, the use of influenza vaccine and changes in other environmental factors (for example, increased breastfeeding rate) has further reduced AOM incidence.

