Acute Otitis Media

خرداد ۱۴۰۰

دکتر سعیده فیروزبخت استاد یار دانشگاه بوشهر

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otitis media (OM) : 2 main categories

- 1.suppurative /**acute otitis media (AOM)**
- 2.nonsuppurative or **secretory OM**, or **otitis media with effusion (OME)**
- **middle-ear effusion (MEE)**: is a feature of both AOM and of OME and is an expression of the underlying **middle-ear mucosal inflammation.**
- MEE : conductive hearing loss (CHL) :ranging from none to as much as 50 dB of hearing loss

incidence

- The peak incidence and prevalence of OM is during **the 1st 2 yr of life**.
- ***More than 80%*** of children experience ***at least one episode*** of OM by the ***age of 3 yr***.
- OM is a leading reason for
- physician visits and for use of ***antibiotics*** and figures importantly in the differential diagnosis of ***fever.***
- Accurate visualization of the tympanic membrane (TM) and middle-ear space may be difficult because of anatomy, patient cooperation, or blockage by cerumen, both ***underdiagnosis and overdiagnosis occur***.

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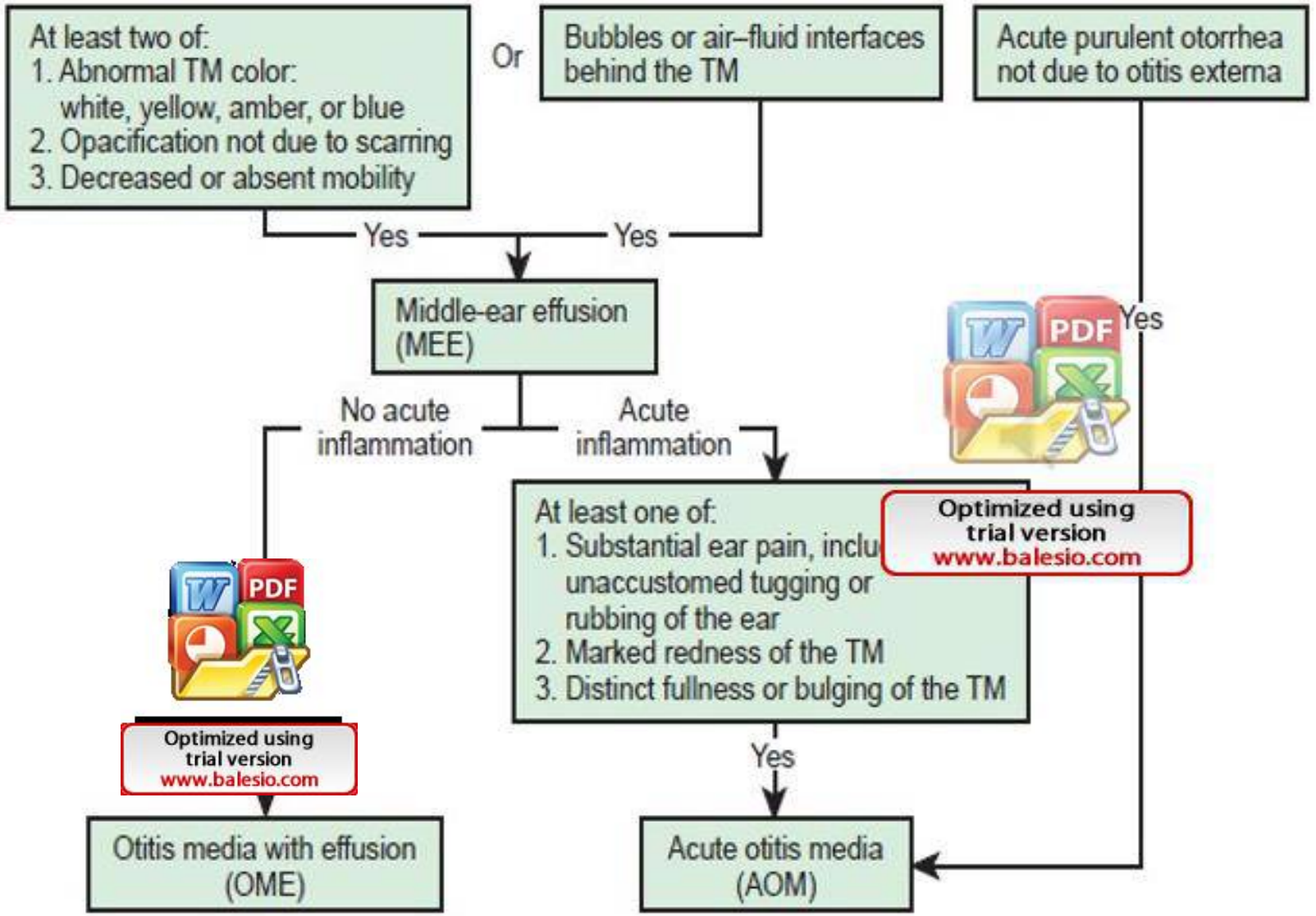

Fig. 658.1 Algorithm for distinguishing betwe
acute otitis media and otitis media with effusi
TM, tympanic membrane.

Fig. 658.2 Examples of normal tympanic membrane **(A)** and of mild bulging **(B)**, moderate bulging **(C)**, and severe bulging **(D)** of the tympanic membrane from middle-ear effusion. *(Courtesy of Alejandro Hoberman, MD.)*

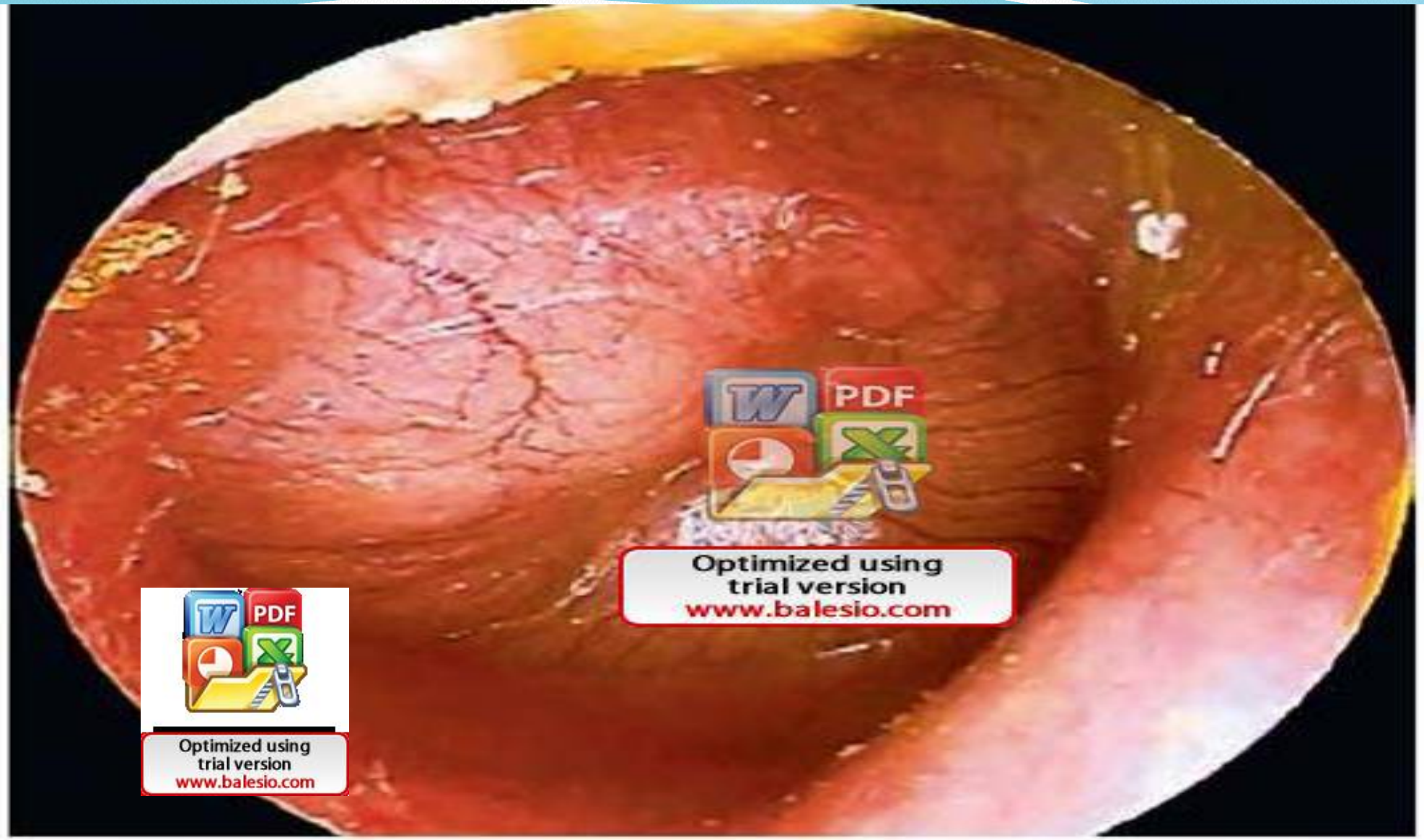

Fig. 658.3 Tympanic membrane in acute otitis media.

EPIDEMIOLOGY

- Several factors affect the *occurrence of OM*, including
- age, gender, race, genetic background, socioeconomic status, breast milk feeding, degree of exposure to tobacco smoke, degree of exposure to other children, presence or absence of respiratory allergy, season of the year, and pneumococcal vaccination status.
- Children with certain types of
- immune deficiencies
- congenital craniofacial anomalies (cleft palate)
- ar prone to OM.

ETIOLOGY of Acute Otitis Media

- Three **pathogens predominate** in AOM:

  Streptococcus pneumoniae

  nontypeable *Haemophilus influenzae*

  Moraxella catarrhalis .

  13-valent pneumococcal conjugate vaccine has reduced the prevalence of *S. pneumoniae* as a cause of AOM.

- ***Le*** ***athogens*** include group A streptococcus, *Staphylococcus aureus* , and Gram-negative org

- ***Gr*** ***organisms*** and *S. aureus* are found most commonly in ***neonates*** and very ***young inf*** hospitalized

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ETIOLOGY of Acute Otitis Media

- Evidence of respiratory viruses also may be found in middle-ear exudates of children with AOM, either alone or, more commonly, in association with pathogenic bacteria.
- Of these viruses, rhinovirus and respiratory syncytial virus are found most often.
- AOM is a known complication of bronchiolitis.

CLINICAL MANIFESTATIONS

- Symptoms of AOM are variable, especially in infants and young children.
- ***In young children***, evidence of ear pain may be manifested by irritability or a change in sleeping or eating habits and occasionally, holding or tugging at the ear. *Pulling at the ear alone has a low sensitivity and specificity.*
- Fever may also be present and may occasionally be the **only sign.**
- Rupture of the TM **with purulent otorrhea** is uncommon.
- Symptoms associated with upper respiratory tract infections also occur; occasionally there may be no symptoms of disease having been discovered at a routine health examination.

EXAMINATION OF THE TYMPANIC MEMBRANE ,Otoscopy

- Two types of otoscope heads are available:
- **surgical**, and **diagnostic** or **pneumatic**.
- Examination of the ear in young children is a relatively invasive procedure that is often met with lack of cooperation by the patient.
- A speculum pushed too far forward and placed in this area often causes skin abrasion and pain.
- Le rform **pneumatic otoscopy** is a critical skill in being able to assess a child's ear an an accurate diagnosis of AOM.
- Pa ng of cerumen with cotton-tipped swabs often worsens cerumen impaction by umen deeper into the canal, compacting it.
- If the TM is obscured by cerumen, the cerumen should be removed.

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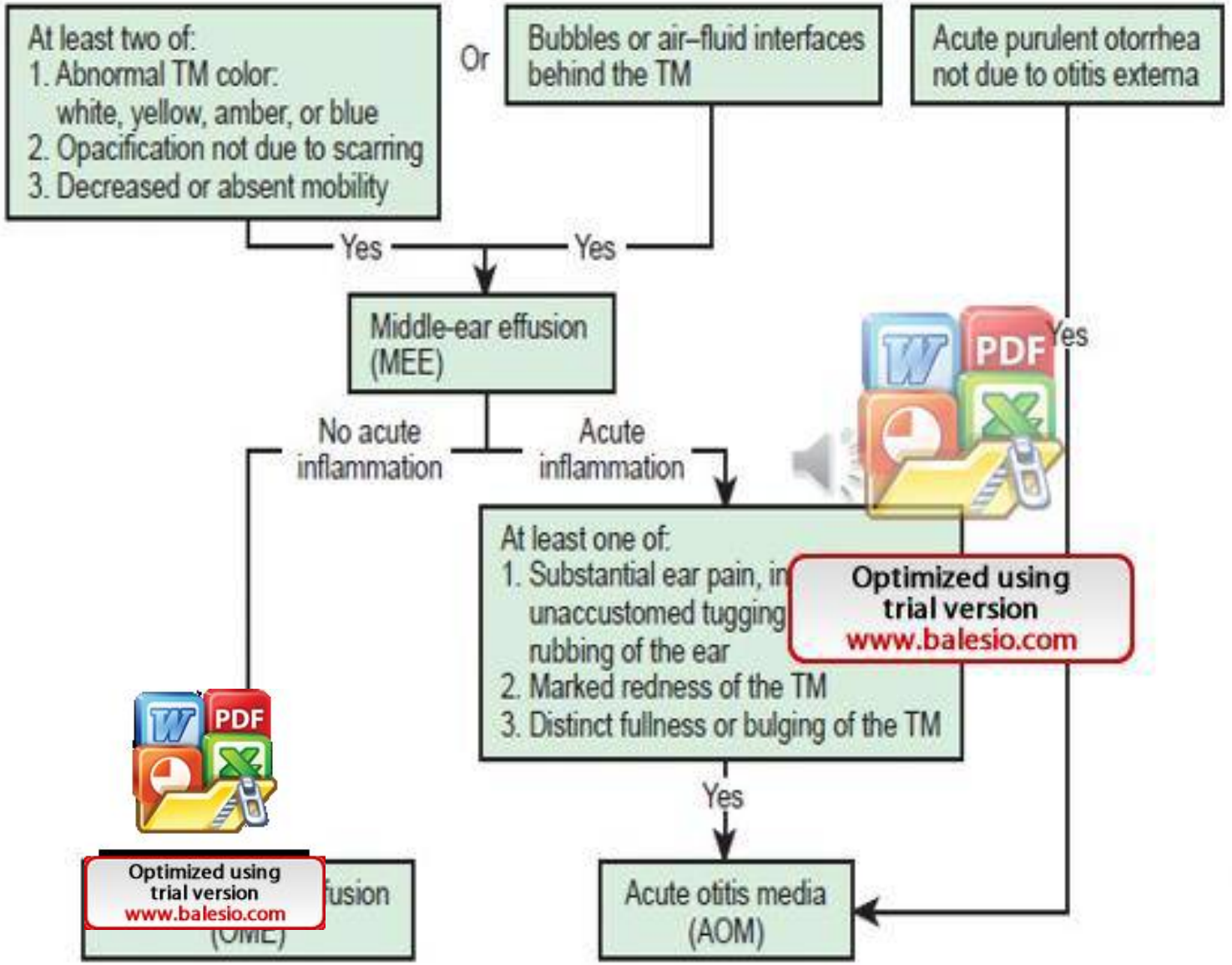

Fig. 658.1 Algorithm for distinguishing between acute otitis media and otitis media with effusion. *TM*, tympanic membrane.

AOM instead of OME

- To support a diagnosis of AOM instead of OME in a child with MEE, distinct fullness or bulging of the TM may be present, with or without accompanying erythema, or by ear pain.
- Unless intense, erythema alone is insufficient because erythema, without other abnormalities, may result from crying or vascular flushing.
- In AOM, the malleus may be obscured and the TM may resemble a bagel without a hole but with a central depression. Bullous myringitis is a physical manifestation.

مشکل گوش / گلودرد

مشکل گوش را ارزیابی کنید.

اگر کودک مشکل گوش دارد سؤال کنید:

- آیا درد گوش وجود دارد؟
- اگر بله برای چه مدتی؟
- آیا از گوش ترشح خارج می شود؟
- اگر بله برای چه مدتی؟

معاینه و بررسی کنید:

- وجود تورم دردناک پشت گوش (ماستوئید)
- خروج چرک از مجرای گوش
- دمای بدن کودک را اندازه گیری کنید.

طبقه‌بندی کنید

علائم و نشانه ها	طبقه بندی	تشخیص نوع درمان
• تورم دردناک استخوان ماستوئید همراه یا بدون جابجایی لاله گوش و تب مساوی یا بالای [illegible] سانتیگراد (زیر بغلی)	ماستوئیدیت حاد	• اقدامات قبل از انتقال (ص ۲۵) را انجام داده و کودک را انتقال دهید. • برای تسکین درد استامینوفن یا ایبوپروفن (ص ۳۱) بدهید.
• در صورت وجود هر یک از [illegible] • ترشح چرکی از [illegible] روز • درد حاد گوش ([illegible] ساعت)	عفونت حاد گوش میانی	• برای مدت ۱۰ روز آنتی بیوتیک مناسب (ص ۲۹) تجویز کنید. • برای تسکین درد استامینوفن یا ایبوپروفن (ص ۳۱) بدهید. • در صورت وجود ترشح ،گوش را با فتیله‌گذاری خشک کنید. • به مادر توصیه کنید چه زمانی فورا برگردد. • به مادر توصیه کنید در صورت عدم بهبودی، ۲ روز بعد مراجعه کند.
• خروج چرک از گوش برای مدت ۱۴ روز یا بیشتر وجود دارد.	عفونت مزمن گوش	• به مادر آموزش دهید مراقب عدم ورود آب به گوش کودک باشد. • درصورت وجود ترشح، گوش را با فتیل[illegible] • درمان با قطره سیپروفلوکساسین برای[illegible] • جهت پیگیری بیماری ۵ روز بعد مراج[illegible] • در صورت عدم پاسخ به درمان کودک[illegible] • پس از بهبودی، جهت ویزیت مجدد[illegible]
• ترشح چرکی یا درد گوش وجود ندارد.	عفونت گوش وجود ندارد	• هیچ درمانی نیاز نیست.

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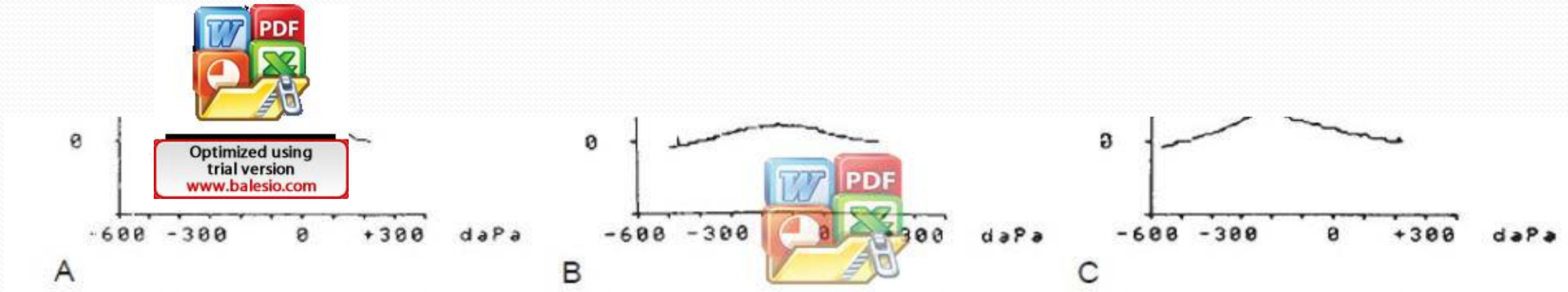
Conjunctivitis-Associated Otitis Media

- Simultaneous appearance of purulent and erythematous conjunctivitis with an ipsilateral OM is a well-recognized presentation, caused by nontypeable *H. influenzae* in most children.
- Topical ocular antibiotics are ineffective.

Tympanometry

- Tympanometry is a simple, rapid, atraumatic test that, when performed correctly, offers objective evidence of the presence or absence of MEE.
- Anything tending to stiffen the TM, such as TM scarring or middle-ear fluid, reduces the TM compliance, which is recorded as a flattening of the curve of the tympanogram.
- **Tympanograms** may be grouped into 1 of 3 categories



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g. 658.5 Tympanograms obtained with a Grason-Stadler Analyzer, exhibiting **(A)** high admittance, steep gradient ., sharp-angled peak), and middle-ear air pressure approximating (0 decaPascals [daPa]); **(B)** low admittance and indeterminate ddle-ear air pressure; and **(C)** somewhat low admittance, gradual gradient, and markedly negative middle-ear air pressure.

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PREVENTION

- Avoiding exposure to individuals with respiratory infection;
- Appropriate vaccination strategies against pneumococci and influenzae;
- Avoiding environmental tobacco smoke;
- Breast milk feeding.

Treat ment

- For younger patients, <2 yr of age, treat all confirmed diagnoses of AOM.
- In patients, <6 mo of age, even presumed episodes of AOM should be treated.
- In children between 6 and 24 mo of age who have a questionable diagnosis of OM but severe disease, defined as temperature of >39°C, significant otalgia, or toxic appearance, antibiotic therapy is also recommended.
- Children between 6 and 24 mo of age with a questionable diagnosis and nonsevere dis bserved for a period of 2-3 days with close follow-up.
- Tre nger than 10 days may be required for children who are very yo ing severe episodes or whose previous experience with OM has be c.

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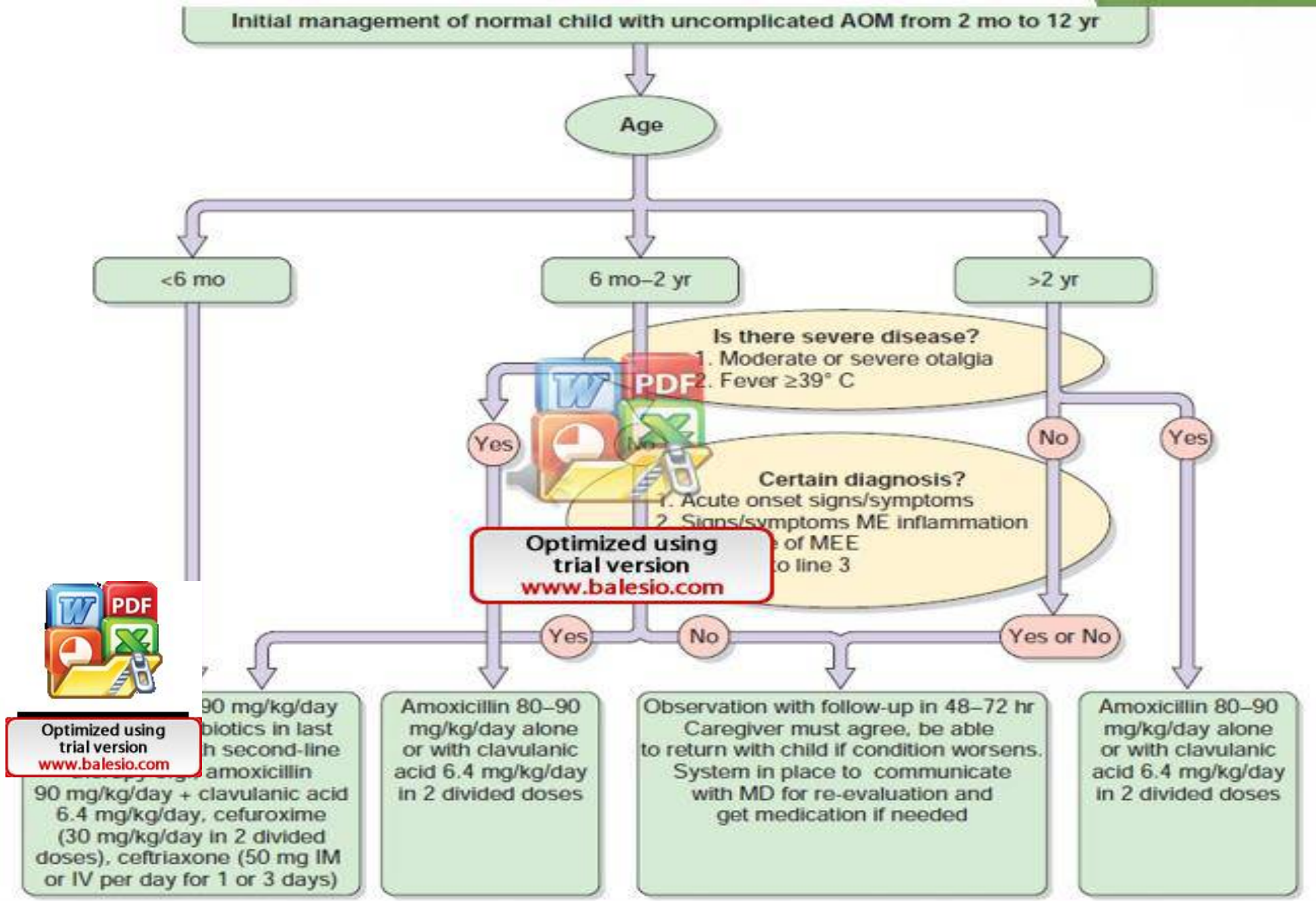

Fig. 658.6 Algorithm for management of acute otitis media. *(From Mazer BD: Otitis media. In Leung DYM, Szefler SJ, Bonilla FA, et al. editors: Pediatric allergy: principles and practices, ed 3, Philadelphia, 2016, Elsevier, Fig 25-3.)*

Table 658.3 Suggested Antibiotics for Treatment of Otitis Media and for Patients Who Have Failed First-Line Antibiotic Treatment

Initial Immediate or Delayed Antibiotic Treatment		Antibiotic Treatment After 48-72 hr of Failure of Initial Antibiotic Treatment	
RECOMMENDED FIRST-LINE TREATMENT	**ALTERNATIVE TREATMENT (IF PENICILLIN ALLERGY OR SUSPICION OF BETA LACTAMASE-PRODUCING ORGANISMS)**	**RECOMMENDED TREATMENT**	**ALTERNATIVE TREATMENT**
Amoxicillin (Pathogens include *Pneumococcus, H. influenzae* non-type B, *Moraxella*)	Cefdinir	Amoxicillin-clavulanate	Ceftriaxone
or	*or*	*or*	Faliure of second antibiotic
Amoxicillin-clavulanate Ceftriaxone IM/IV for 1-3 days	Cefpodoxime Ceftriaxone Levofloxacin	Ceftriaxone	Azithromycin Tympanocentesis*

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ANTIBIC
- Amoxi y bid for 10 days
- Amoxi ratio 14:1) 90 mg/kg/day of amoxicillin component bid for 10 days
- Ceftria ay qd IM, IV for 1-3 days
- Cefdini qd for 10 days
- Cefpodoxime 10 mg/kg/day bid for 10 days
- Levofloxacin 20 mg/kg/day bid if ≤ 5 yr for 10 days; 10 mg/kg/day bid if > 5 yr for 10 days
- Azithromycin 10 mg/kg/day on day 1 QD then 5 mg/kg/day days 2-5 qd or 10 mg/kg/day for 3 days QD or 20 mg/kg once

IM, intramuscular; IV intravenous; bid, twice daily; qd, once daily.
*Tympanocentesis for those who fail second-line therapy.

Treat ment

- Clarithromycin and azithromycin have only limited activity.
- Clindamycin is active against most strains of *S. pneumoniae*, but is not active against nontypeable *H. influenzae* or *M. catarrhalis.*
- Cefixime, trimethoprim-sulfamethoxazole, and erythromycin-sulfisoxazole have significant lack of effectiveness .
- Antimicrobial prophylaxis clearly outweigh potential benefits.
- Co s, antihistamine-decongestant ,topical intranasal steroid sprays and mucolytic ag er recommended for treatment of OME and are contraindicated for OME tre

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Follow-up

- Follow-up within days is advisable in the young infant with a severe episode or in a child of any age with continuing pain.
- Follow-up within 2 wk is appropriate for the infant or young child who has been having frequent recurrences. At that point, the TM is not likely to have returned to normal, but substantial improvement in its appearance should be evident.
- In the child with only a sporadic episode of AOM and prompt symptomatic improvement, follow-up 1 mo after initial examination is early enough, or in older children, no follow-up may be necessary

Myringotomy and Insertion of Tympanostomy Tubes

- When AOM is recurrent, despite appropriate medical therapy, consideration of surgical management of AOM with tympanostomy tube insertion is warranted, it in reduce the rate of AOM .
- When a patient experiences three episodes of AOM in a 6-mo period, or four episodes in a 12-mo period with one episode in the preceding 6 mo, potential surgical management of the child's AOM should be discussed with the parents

Table 658.5 Manifestations of the Sequelae and Complications of Otitis Media

COMPLICATION	CLINICAL FEATURES
ACUTE	
Perforation with otorrhea	Immobile tympanic membrane secondary to visible perforation, exudate in ear canal
Acute mastoiditis with periostitis	Tenderness and erythema over mastoid process, no destruction of bony trabeculae
Acute mastoid osteitis	Destruction of bony trabeculae; tenderness and erythema over mastoid process coupled with outward displacement of pinna
Petrositis	Infection of perilabyrinthine cells; may present with otitis, paralysis of lateral rectus, and ipsilateral orbital or facial pain (Gradenigo syndrome)
Facial nerve palsy	Peripheral cranial nerve VII paralysis
Labyrinthitis	Vertigo, fever, ear pain, hearing loss, tinnitus, nausea and vomiting
Lateral sinus thrombosis	Headache, fever, seizures, altered states of consciousness, septic emboli
Meningitis	Fever, headache, nuchal rigidity, seizures, altered states of consciousness
Extradural empyema	Fever, headache, seizures, altered states of consciousness
Subdural empyema	Fever, headache, seizures, altered states of consciousness
Brain abscess	Fever, headache, altered states of consciousness, focal neurologic examination
NONACUTE	
Chronic otitis media with perforation	Immobile tympanic membrane with perforation
Otitis media with effusion (OME)	Immobile, opaque tympanic membrane
Adhesive otitis	Irreversible conductive hearing loss secondary to chronic OME
Tympanosclerosis	Thickened white plaques may cause conductive hearing loss
Chronic suppurative otitis media	Following acute otitis media with perforation, secondary infection with *Staphylococcus aureus*, *Pseudomonas aeruginosa*, or anaerobes develops, causing chronic otorrhea
Cholesteatoma	White, pearl-like destructive tumor with otorrhea arising near or within tympanic membrane; may be secondary to chronic negative middle ear pressure
Otitic hydrocephalus	Increased intracranial pressure secondary to AOM; signs and symptoms include severe headaches, blurred vision, nausea, vomiting, papilledema, diplopia (abducens paralysis)

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