

Otitis Media (Middle Ear Infection)

A plain-English guide for you and your family

WHAT IS HAPPENING

Otitis media means an infection in the middle ear, the small air-filled room that sits right behind your eardrum. Normally that space stays dry and lets three tiny bones vibrate to carry sound to your inner ear. But when a cold or allergy swells the tube that drains the middle ear (the eustachian tube, which runs from your ear down to the back of your throat), fluid gets trapped. Germs—usually bacteria like *Streptococcus pneumoniae* or *Haemophilus influenzae*, or sometimes viruses—grow in that trapped fluid and cause an infection. The infected fluid builds up pressure, pushes on the eardrum, and makes it red, bulging, and painful. Your child (or you) might tug at the ear, have trouble hearing, run a fever, or feel cranky. Sometimes the pressure gets so high that the eardrum tears a little and thick yellow or clear fluid drains out, which actually relieves the pain. Most middle ear infections clear up on their own in a few days, but some need an antibiotic—especially in babies under six months, children with high fever, both ears infected, or symptoms lasting more than two or three days. Repeated infections can leave fluid sitting in the middle ear for weeks (called otitis media with a fluid collection (effusion)), which muffles hearing and can slow speech development in toddlers if it goes on too long. That's why doctors watch these infections closely and sometimes put in tiny tubes through the eardrum to let the fluid drain and air in.

What you might feel

- Ear pain (otalgia) that gets worse when lying down
- Fever (usually 100–104°F)
- Trouble hearing or feeling like sounds are muffled
- Fluid draining from the ear (otorrhea)
- Pulling or tugging at the ear (especially in babies and toddlers)
- Fussiness, irritability, or trouble sleeping
- Loss of balance or clumsiness
- Vomiting or loss of appetite
- Bulging, red eardrum seen on exam (hallmark finding)

- Severe headache, stiff neck, or confusion

Call the doctor right away if...

- Severe headache, stiff neck, or the child cannot touch chin to chest (possible meningitis—infection of the brain's covering)
- Swelling, redness, or tenderness of the bone behind the ear (mastoiditis—infection has spread into the skull bone)
- Facial weakness or drooping on one side (the facial nerve runs through the middle ear; swelling can pinch it)
- Persistent high fever above 102.2°F for more than 48 hours despite antibiotics, or the child looks very ill and listless
- New confusion, extreme drowsiness, seizure, or inability to wake the child fully (signs infection may have reached the brain)

What the care team will do

- Assess and manage pain using age-appropriate pain scales, and give pain medicine (like acetaminophen or ibuprofen) as ordered.
- Check the ear with an otoscope (a lighted tool to look inside the ear canal) and watch for drainage, redness of the eardrum, or bulging.
- Teach the patient or family how to give antibiotics correctly (full course, right dose, right times) if they are prescribed.
- Monitor for signs the infection is spreading, like high fever that won't go down, new swelling or redness behind the ear, severe headache, stiff neck, or confusion.
- Educate about measures that help prevent future ear infections, like avoiding smoke exposure, breastfeeding infants when possible, keeping vaccines up to date, and practicing good hand hygiene.
- Schedule or remind about follow-up to recheck the ears in 2-4 weeks, especially in young children, to make sure fluid has cleared and hearing is normal.

Medicines you may be given — and why

Amoxicillin

This antibiotic breaks down the walls that bacteria build around themselves to stay alive. When those walls fall apart, the bacteria die. Amoxicillin targets the most common germs that cause middle ear infections, especially *Streptococcus pneumoniae* (a round ball-shaped germ) and *Haemophilus influenzae* (a rod-shaped germ).

Amoxicillin-Clavulanate (Augmentin)

This combination has two parts. Amoxicillin breaks down bacterial walls (just like plain amoxicillin), and clavulanate blocks a defensive enzyme (called beta-lactamase) that some bacteria make to destroy amoxicillin. Together, they kill bacteria that plain amoxicillin cannot touch, including some strains of *Haemophilus influenzae* and *Moraxella catarrhalis* that have learned to fight back.

Cefdinir

Cefdinir is a backup antibiotic that also breaks bacterial cell walls, but it is built on a slightly different chemical frame than penicillin. This makes it useful when a child is allergic to penicillin or when first-line treatment has not worked. It kills the same common ear-infection bacteria: *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*.

Azithromycin (Zithromax)

Azithromycin stops bacteria from making the proteins they need to grow and multiply. It does this by locking onto the bacteria's protein-making factory (the ribosome) so the factory cannot read its instruction manual (messenger RNA). Without new proteins, the bacteria cannot reproduce or repair themselves, and they eventually die. This drug is a second-choice option, used mainly when a child is allergic to penicillin or cephalosporins.

Acetaminophen (Tylenol)

Acetaminophen blocks the production of chemicals in the brain (called prostaglandins) that turn up the body's pain and fever signals. It does NOT fight infection or reduce inflammation in the ear itself; it only makes your child more comfortable while the body (or antibiotics) clears the infection.

Ibuprofen (Advil, Motrin)

Ibuprofen blocks an enzyme (cyclooxygenase, or COX) that makes prostaglandins, the chemicals that cause pain, fever, and swelling. By stopping prostaglandin production, ibuprofen reduces all three symptoms at once. It works throughout the body, including in the inflamed tissues of the middle ear, making it slightly more effective than acetaminophen for ear pain because it calms inflammation as well as pain signals.

Where this information comes from

- American Academy of Pediatrics (AAP) 2013 Clinical Practice Guideline: Diagnosis and Management of Acute Otitis Media
- American Academy of Family Physicians (AAFP) Otitis Media Guidelines
- CDC - Ear Infection (Otitis Media) Information

- Cochrane Database Systematic Review: Antibiotics for Acute Otitis Media in Children

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