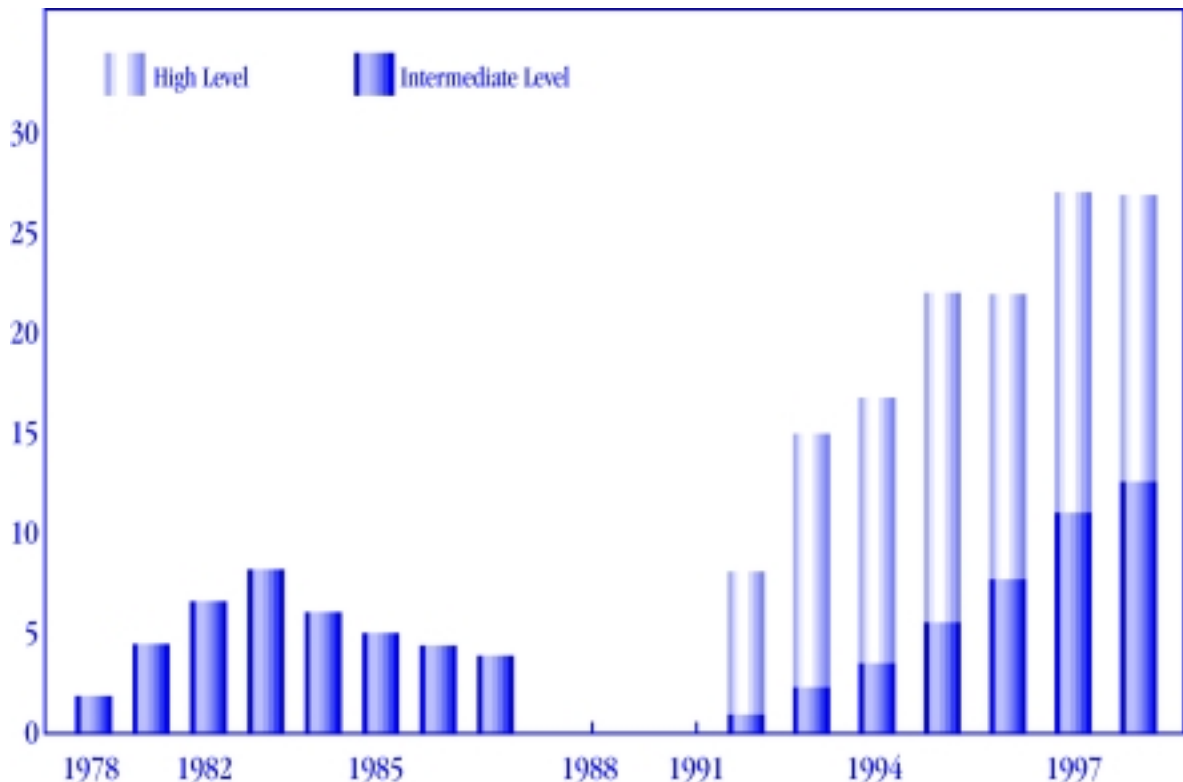


JUDICIOUS ANTIBIOTIC USE

AN APPROACH TO UPPER RESPIRATORY ILLNESS IN CHILDREN

Penicillin resistance in *Streptococcus pneumoniae* United States 1979-1998

% of nonsusceptible isolates



1979-1994 CDC Sentinel Surveillance Network

1995-1998 CDC Active Bacterial Core Surveillance (ABCS) system –
emerging infections program

**A collaboration between the Division of Medical Assistance (MassHealth),
REACH Mass, and the Antibiotic Recommendation Work Group.**

Key general messages

1. Antibiotic resistance in common human bacterial pathogens is increasing in Massachusetts. Data from a Massachusetts pediatric hospital indicates that *Streptococcus pneumoniae* susceptibility to penicillin has decreased from 95% in 1991 to 71% in 1999.
2. Antibiotic-prescribing to children contributes to the emergence of resistant bacteria in those children, and in the community as a whole.¹
3. Prescribing for otitis media accounts for 42% of antibiotics for children under 10 years, and up to 60% of prescribing for young children under three.²
4. Limiting antibiotic use to only children diagnosed with bacterial infection, using strict criteria, will substantially decrease antibiotic use in Massachusetts communities.

What clinicians can do

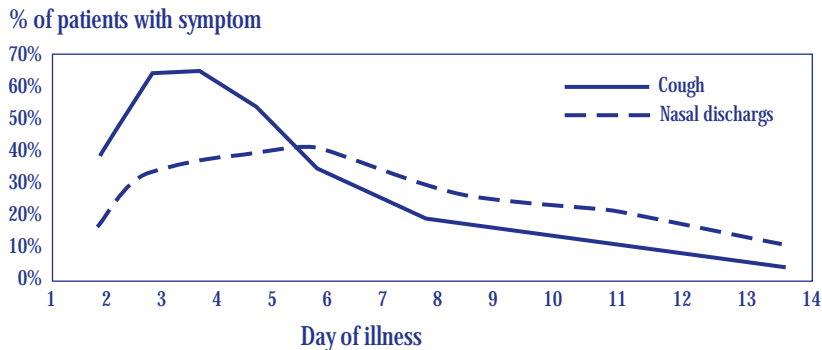
1. Educate patients about the frequency and natural history of viral upper-respiratory infections (URIs), emphasizing that antibiotics are ineffective for this condition.
2. Talk about the appropriate use of antibiotics at four- and 12-month well-child visits as recommended by the American Academy of Pediatrics (AAP) in *Guidelines for Health Supervision*.³
3. Create an office environment that promotes the judicious use of antibiotics.
 - Provide educational materials in the waiting room and in exam rooms about the judicious use of antibiotics and the management of URIs.
 - Actively distribute and explain educational materials to families and caregivers.
 - Involve office staff in your patient-education efforts.
4. Prescribe oral antibiotics only following an examination.
5. Start treatment with amoxicillin (unless allergic) for otitis media and sinusitis.
6. Offer symptom-management strategies, including an explanation of the expected course of the illness, suggestions for managing fever and pain (especially night-time onset of ear pain), options for reducing congestion, and reassurance about the safety of watchful waiting in selected cases.
7. Recommend immunization with pneumococcal conjugate vaccine (Prevnar) in all children under two years and older moderate- to high-risk children. Provide influenza vaccine to high-risk children each year.
8. Verify, in writing, that a child can return to day care without antibiotics.

Cough and runny nose

Educate parents about URIs in children.

- Children under three who attend day care have an average of six to nine viral URI's each year.⁴
- During these infections, even if uncomplicated, cough and nasal discharge may persist for 14 days or longer, even after other symptoms have resolved.

Duration of symptoms in 139 rhinovirus colds⁵



- In a viral URI, mucous may change in color from clear to yellow to green. This is NOT an indication of bacterial infection.
- Antibiotics do not effectively treat viral URIs, or prevent subsequent bacterial infections.⁶

Cough

1. Cough or “bronchitis” in children, in the absence of focal bacterial infection, does NOT benefit from antibiotic treatment.
2. Treating cough due to a viral illness will not prevent pneumonia.⁷
3. Treat for bacterial pneumonia only in the presence of fever, tachypnea, toxic appearance, and/or focal exam. If diagnosis is uncertain, radiological confirmation should be considered to reduce overtreatment.
4. Persistent or chronic cough rarely represents bacterial illness. Consider pertussis for prolonged cough if clinical data warrant. Non infectious conditions such as allergy and asthma should be carefully considered if symptoms persist or recur frequently.

Sore Throat/ Pharyngitis⁸

1. Most sore throats are caused by viral agents.
2. Clinical findings alone do not adequately distinguish strep vs. non-strep pharyngitis.
3. Antigen tests (rapid strep kits) or culture should be positive before beginning antibiotic treatment
 - Experts suggest confirming negative results of antigen tests with a culture.
4. Experts discourage treating patients with antibiotics pending culture results, but if you do:
 - Make sure patients stop antibiotics when the culture is negative.
 - Discourage parents from saving antibiotics.
5. If an antibiotic is prescribed:
 - Use a penicillin as treatment for group-A strep.
 - Use erythromycin if penicillin-allergic

Sinusitis

1. Though viral URIs often involve the sinuses, only a small minority are complicated by bacterial sinusitis. Many patients will have residual symptoms after a cold; these symptoms usually resolve slowly. Twenty percent of individuals with simple URIs still have nasal discharge or cough after ten days.⁹ To avoid unnecessary treatment, use the following specific criteria for bacterial sinusitis:
 - At least 10 to 14 days of rhinorrhea and persistent daytime cough without improvement.OR
 - Symptoms of acute bacterial sinusitis (rare in children), including toxic appearance, facial pain or tenderness, or periorbital swelling, with or without high fever.
2. Radiological studies are rarely helpful for diagnosing sinusitis and may even cloud the diagnostic picture since many children with simple viral URI will have radiographic changes.¹⁰
3. Amoxicillin is the preferred first-line agent for initial treatment of bacterial sinusitis. Antibiotics should be prescribed for no more than 10-14 days.¹¹

Otitis Media (OM)

1. Antibiotic prescriptions for the treatment of OM account for most of the antibiotic use in young children.¹²
2. To avoid unnecessary antibiotic prescribing, use strict criteria for the diagnosis of otitis media.¹³ To diagnose otitis media, use pneumatic otoscopy. The diagnosis of acute otitis media (AOM) requires middle-ear effusion and signs of acute inflammation. Otitis media with effusion (OME) may be present in viral URIs but does not require antibiotic therapy.

Indicators of middle-ear effusion include:

- Decreased or absent mobility of the tympanic membrane
- Yellow or white discoloration of the tympanic membrane
- Opacification other than that resulting from scarring
- Loss of landmarks
- Visible air-fluid interfaces.

Signs and symptoms of acute inflammation include:

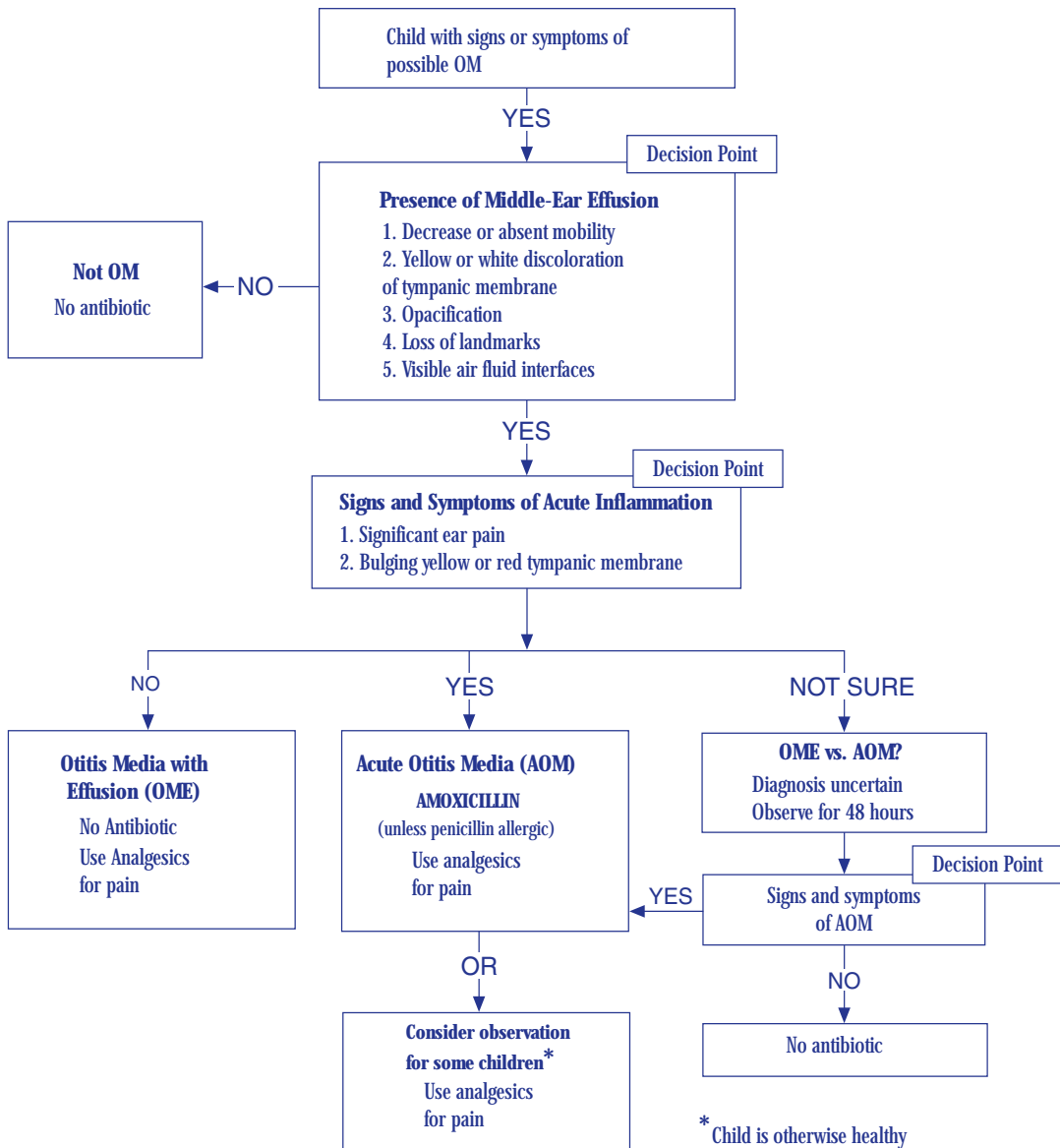
- Significant ear pain and/or
- Bulging yellow or red tympanic membrane.

3. Clinicians often under-treat pain. Support the use of the following when clearly indicated: topical analgesics, acetaminophen, ibuprofen, and codeine-containing compounds.
4. Seventy percent of all otitis media and ninety percent of mild otitis media resolves without antibiotic treatment.¹⁴ Common practice in the United States continues to be antibiotic treatment.¹⁵ However, some providers are comfortable observing selected children with mild to moderate disease over two years of age for 48 hours without antibiotics.¹⁶ Consider observation when:
 - Child is otherwise healthy
 - Child is over two years of age
 - Parents understand treatment options and agree
 - Medical follow-up is assured.
5. If AOM is diagnosed,
 - Choose Amoxicillin first (unless penicillin allergic).
 - Consider high-dose amoxicillin for initial treatment. For children older than two years, some evidence suggests that treatment for five days has outcomes similar to longer-term therapy (10 days).¹⁷
 - Antibiotic prophylaxis for recurrent AOM contributes to antibiotic resistance and should be used only for selected patients.
 - If the diagnosis is ambiguous, do not treat with antibiotics. Re-assess in 24-48 hours.

6. Diagnose OME if effusion is present with no acute inflammation.¹⁸

- Don't treat initial presentation of OME with antibiotics.
- Effusion may persist for up to three months. There is no evidence of substantial benefit from treatment with antibiotics in these cases.
- After three months, refer patient for hearing evaluation and consider antibiotic treatment or referral for myringotomy tube placement for persistent effusion with documented bilateral hearing loss.¹⁹

Otitis Media Chart



* Child is otherwise healthy
Over 2 years of age
Parents understand treatment and agree
Medical follow-up assured

Sources

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