Middle Ear Infections

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This illness is likely the most common reason for the prescribing of an antibiotic to an infant or child in the United States. There is a degree of expectation from all parties concerned that the establishment of this diagnosis will most certainly lead to the use of an antibiotic. As with all aspects of medicine, there are guidelines and recommendations in this area. That said, they are guidelines and in the individual case, other circumstances may make diversion from the guidelines advisable.

In the very young (< 6 months, or in the eyes of many, < 24 months) the use of antibiotics for acute suppurative otitis media (middle ear infection) should be a near certainty. In patients with significant fever, significant ear pain, bilateral as opposed to unilateral disease, ear drum rupture or ear drainage or abnormal hosts with risk for more severe infection, antibiotic use is a more certain recommendation.

Participation in daycare is certainly part of the crucible that precipitates middle ear infection. For the most part, the runny nose of viral respiratory infection is part of the recipe for middle ear infection. The infected ear will usually follow after the nose (and perhaps cough) by a few to several days. It's simplistic to think of this as just because "stuff gets plugged up". Host defenses at the mucus membrane level are altered by viral inflammation enhancing the probability of viral or secondary bacterial invasion. The commingling of children in the daycare and the colonization of the upper respiratory tract with the pathogens selected for in daycare by crowding and frequent antibiotic use makes more virulent infection likelier in daycare than in the home setting. Remember all the good the daycare does, though, before you grow discouraged by middle ear infections in the daycare setting. Infections do occur at home, in-home daycare and in the absence of pre-existing wet noses - just less often.

The array of bacteria (remember that many of the middle ear infections are caused by viral pathogens not subject to effective treatment by any antibiotic) that produce middle ear infections are relatively few in number. For this short list of bacteria, amoxicillin and amoxicillin/clavulanate

clearly offer the best probability of eradication by orally administered antibiotics. For penicillin allergic or intolerant children, other choices are available, but the probability of the offending bacteria being susceptible to these other choices is clearly less. Given the short list of effective antibiotic choices, using antibiotics only when indicated and giving proper doses on the prescribed schedule will help to keep the few choices we have left effective for the present and future. Be attentive to what you are doing with antibiotics and you can be an effective steward for antibiotic potency into the future.

After a middle ear infection, residual fluid in the middle ear chamber is common. At two weeks after infection, a majority of young children will have fluid in the middle ear chamber. As time goes by (measured in months, not days or weeks) the percentage of children with fluid will decrease to near zero. Studies vary, the criteria for normalcy are variable and thus statistics regarding spontaneous resolution of fluid in the middle ear chamber vary considerably adding to confusion about when and what to do about fluid in the middle ear chamber. The ultimate goal is to preserve hearing and speech development. As a result, a number of soft risk criteria associated with long term persistence of fluid and therefore a SUSPICION that risk of hearing and speech consequences is more likely, has been developed. As you read the following list, understand this data is somewhat subjective.

1. Severe hearing loss: > 40 decibel hearing threshold
2. Bilateral vs. unilateral disease
3. Severe retraction of the ear drum on examination
4. Pre-existing speech delay
5. Younger children (< 3 years of age)
6. Infants in "prime-time" speech acquisition months
7. Day care and recurrent infections = more fluid persistence
8. Allergic rhinitis associations - pretty "fuzzy" data support
9. GERD - "fuzzy" data, but may be relevant on occasion
10. Second hand tobacco smoke - good evidence for this
11. Developmentally challenged children and infants
12. Craniofacial abnormalities - i.e. cleft palate
13. The calendar - better "daycare health" in summer
14. Allergy to penicillin / loss of best "indicated" antibiotics

As you can readily see, sorting through all these particulars could require the expertise of speech therapy, audiology, otolaryngology, gastroenterology, pediatrics and social work. In the face of all the interwoven and somewhat subjective risk factors, guidelines (here we go again) have evolved that try to define a pragmatic interpretation of all of this. One approach, certainly not the only approach, would suggest three acute (therefore painful) infections in six months or four infections in twelve months or fluid that persists (not painful) for three months or more could be referred for evaluation by otolaryngology for P.E. (pressure equalization) tubes. The larger the number of risk factors above included as part of the clinical picture the more likely a surgical approach may be best.

Either choice comes with risk. It is the nature of decision making in medicine to weigh risks vs. benefits. Certainly repeated antibiotic use carries the risk of drug allergy or other intolerances. Gastrointestinal consequences with diarrhea (and diaper rash in infants) are a not uncommon consequence. Much rarer consequences in gastrointestinal disorders would include antibiotic associated colitis. Changes in the patient's individual biome are of less certain medical consequence, but the conversation needs to be considered. Surgical intervention carries the risk of anesthesia and the surgery itself. The durability of P.E. tubes is uncertain and a second procedure to reinsert or remove a P.E. tube is a consideration. Persistent perforations and recurrent ear infection despite P.E. tubes are an uncommon problem, but do occur. Once inserted, some degree of water protection for the middle ear will be recommended.

In the short term, audiological data and parental questionnaires support the idea that hearing and speech are positively impacted by surgical intervention. Many parents will attest to marked changes as a result of surgical intervention in the short term. However, in the longer term, differences in outcomes in speech and language acquisition versus those who waited are more subtle.

One can understand why the definitive process of caring for an infant or child with either recurrent middle ear infections or persistent middle ear fluid seems to be made on a case-by-case basis with guidelines providing a blurred set of recommendations. Recommendations for surgical intervention versus watchful waiting are blurred by the complexities of diagnosis.

"Ear infection" as a diagnosis seems straight forward, but the category is confounded by a list of similar and overlapping terminology that would make most linguists or doctors shrink from explaining clearly what each term means.

1. Otitis Media
2. Acute Otitis Media
3. Acute Suppurative Otitis Media
4. Chronic Purulent Otitis Media
5. Serous Otitis Media
6. Acute Serous Otitis Media
7. Chronic Serous Otitis Media
8. Otitis Media with Effusion
9. Eustachian Tube Dysfunction

This is not an exhaustive list, but it points out the number of terms that are similar and may mean different things to different physicians who are relative experts in the field. Couple the "medical babble" with the complexities of accurate observation in the face of cerumen (ear wax), anxious and often combative infants and children and you can see more reasons for struggling for one definitive recommendation about how to handle what is certainly among the top diagnosis for the prescription of antibiotics in infants and children. At the end of the day, as parents, be heartened by the knowledge that given the breadth of the problem, the bulk of children will have experience(s) with middle ear infection or fluid and virtually all will arrive at a point in the future where hearing is normal, speech is normal, language processing is normal and the anatomy of the ear and related structures has been preserved with enough normalcy to be fully functional. These children will have been cared for within the blurred edges of the "guidelines" and though no two legacies will have been exactly the same, the outcomes will be similar enough to be interchangeable in the vast majority of cases.