Does He Really Need an FM?

Considerations:
- Even the mildest hearing losses can affect hearing speech
- Literacy is dependent on knowing the smallest units of speech and how they affect our language – e.g. the plural /s/ in English or the difference between /ba/ and /ma/
- Hearing technology today is better than ever with digital hearing aids and cochlear implants. They give the wearer tailored access to the sounds of speech. Remember, however, that if a hearing loss involves nerve damage – we are putting amplification on an imperfect hearing mechanism.

So again, we ask, if he has this great hearing aid, cochlear implant or BAHS, why do we need an FM system? These personal amplification devices are designed to amplify the sounds that are near the person’s ear. Certainly sounds from a distance can be ‘picked up’ by the microphone of a personal hearing device, but when it comes to understanding speech, the spoken message going into the device needs to be loud and clear. There are three common obstacles to a clear speech signal reaching the person with hearing loss: Distance, noise, and reverberation. FM systems are designed to mitigate these effects.

By wearing a microphone (transmitter), the teacher’s voice is made to sound as if it were only 6 inches from the student’s ear – instead of 10 feet away. The teacher’s voice is then ‘closer’ to the student’s hearing device and ear than the other noise around that student (such as coughing, chairs moving, noise from a heating unit, noise in the hallway, talking, etc.) and therefore the teacher’s voice sounds louder than the ambient or background noise. New technology also has the ability to automatically raise the level of the teacher’s voice over any increase in the background noise in the classroom. This has been a huge advancement in FM systems.

Another issue to combat in any listening environment is reverberation. Reverberation is caused when a sound is produced in an enclosed space and bounces off the walls and other hard spaces until it is absorbed. These ‘echoes’ of the teacher’s speech and the ambient noise in a classroom interfere with a single direct delivery of the message. When using an FM system, the teacher’s voice is delivered directly to the personal hearing device and is not subject to reverberation.

Even though state of the art personal amplification devices (such as digital hearing aids, cochlear implants, and BAHS deliver high quality sound to a person in an ideal listening situation, classrooms are not ideal. The average ambient noise level in classrooms has been measured as 61dB! This is louder than the sounds of speech. Students with hearing loss need a signal-to-noise ratio (e.g. speech louder than the background noise) of 15-20 dB – again, the average classroom teacher speaks only 1 to 5 dB louder than the ambient noise in her classroom.

In addition to being able to hear speech in a classroom, the added critical component of course is being able to understand that speech. Speech recognition in noise is a skill that is developed by about 6th grade. Adults with normal hearing score better on speech understanding in noise than children with normal hearing. Children with normal hearing score better than children with a hearing loss. The greater the degree of hearing loss, the more difficult it is to understand speech in noise. Also, children with other disabilities struggle with listening in noise. These include students with Central Auditory Processing Disorder or difficulty, Autism Spectrum Disorder, ADHD, Dyslexia, Auditory Memory challenges, and English Language Learners.
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If you decide to provide an FM system, please remember that “you get what you pay for”. Not all FM systems are created equal. Make sure an audiologist recommends a system that is compatible with the student’s personal amplification and is adequate for your needs. You want to make sure you are purchasing a system that has been designed for classroom use.

**Contract Audiologists in Central Texas:**

*Please share the names of any other audiologists you know that provide contract work for school districts*

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