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Hearing Aids and Developing Spoken Language for Children with Hearing Loss

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As we keep saying, things keep changing (for the better) for children with hearing loss. As we keep saying, "*It's not the same old deafness*." Prior to the initiation of newborn hearing screening the age of identification of hearing loss in children was around two years of age. As a result, babies were not fit with hearing aids until well after their peers started to listen and talk. Now almost all babies are identified at birth and fit with hearing aids within a couple of months of age. Data from Tomblin, the LOCHI studies, and others indicates that fitting hearing aids early has a significant positive impact on outcomes.

Tomblin et al, Ear and Hearing 2015, did a longitudinal analysis of language abilities for children with hearing loss. They were trying to identify which factors influence language growth in children who are fit with hearing aids. They looked at whether speech was audible through the hearing aid and how many hours a day children wore their hearing aids. The study looked at several language abilities for both children with hearing loss and typical hearing peers.

What do we know?
The study showed that compared to children with typical hearing, children with hearing loss had poorer language abilities than their peers. And, as expected, the more severe the hearing loss, the greater the language delay. However, the most significant finding was that the amount of audible speech through hearing aids and how much the children used the hearing was critical. Children with better audibility had language 2/3 of a standard deviation above that of children with poor audibility.

Is speech audible?
Children with good audibility had significantly better language. This should be no surprise but it is a very important piece of information. What does this mean for clinicians? It means that we must be absolutely that the children we work with are hearing well enough.

How many hours a day do you need to hear?
Even with the best technology children with hearing loss will be missing some things. For them to successfully learn to listen, children need to hear all day long. Let's remember that typical hearing children hear 24 hours a day. *Children who use technology only 4 hours a day will take 6 years to hear what a typical hearing child hears in one year*. So, we need to help families understand that full time use of technology is critical. In the Tomlin et al study, children who wore technology 10 hours/day had more positive language trajectories than children who wore technology less than 10 hours/day.

Why we need to hear soft speech

Much of the language kids learn (about 80%) they learn by overhearing conversation around them. This incidental learning will not be loud – it will be at a soft level. We need to be sure that our kids are hearing at soft levels if they are going to be able to take advantage of incidental learning.

How do you know if a child is hearing well?

It is critical that we start off using electroacoustic measures and are certain that children are reaching target gains with hearing aids. But that is not sufficient. How do we know that children are receiving enough auditory stimulation to develop the auditory brain and to hear soft speech? Only by testing!! In addition to real ear measures it is critical to obtain aided thresholds. WE NEED TO SEE AN AIDED AUDIOGRAM FOR EACH EAR SEPARATELY AND IT NEEDS TO BE AT THE LEVEL OF THE SPEECH STRING BEAN. If children are hearing at the string bean, they will hear normal conversation (at about 45-50 dB HL) and soft speech (at about 30-35 dB HL). They will still have some problems hearing in noise (as do typical hearing people I might point out) but if they can hear soft speech children have a very good possibility of hearing what they need to hear to develop language.

Take away message

The amount of audibility received from technology is a critical predictor of language ability. In addition, professionals can and should monitor the amount of hearing aid use. Parent report as well as technology monitoring can provide information to the audiologist who can then counsel families to help them understand why children need to have technology on their ears every waking hour and why it is critical that they return to the audiologist often to be sure that the technology is doing what it needs to do.