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Chapter 1 : Linda Thibodeau, Associate Professor, Audiology Online | Spoke

Linda M. Thibodeau, PhD Professor University of Texas at Dallas Callier Center for Communication Disorders. Dr. Linda Thibodeau is a Professor at the University of Texas at Dallas since where she co-directs the Pediatric Aural Habilitation Training Specialist Project.

Thibodeau Introduction With early identification of hearing loss, many children are benefiting from hearing technology prior to their first birthday. Consequently, amplification is often recommended to reduce the deleterious effects of hearing loss. The benefit of hearing technology certainly depends on features of the instrument itself, but also is influenced by many interrelated factors that are external to the device. Providing optimal hearing health care for children extends beyond the sophistication of the circuitry worn by the child. Depending on the audiological environment, it may be difficult to address all the hearing health needs of a child due to time constraints. Therefore, a program which addresses seven areas critical to the communication success of children with hearing loss is proposed as shown in Figure 1. Illustration of the interrelationships among key factors to enhance communication success for children with hearing loss. The purpose of this review is to provide a framework for comprehensive hearing health care for children and resources that will facilitate service delivery in these areas. Although some audiologists specialize in pediatrics, particular work settings may not be conducive to providing the proposed comprehensive care. Therefore, efforts may be necessary to network with other service providers such as the educational audiologist who maintains FM technology or speech-language pathologists who may provide coping strategies. Not all of these areas may be offered in one location through services provided by one audiologist. However, it is incumbent upon the professional who serves children with hearing loss to consider the needs of children in these seven areas and provide recommendations and referrals when necessary so that all seven areas are addressed. Each area will be discussed in greater detail with references to resources that may facilitate service delivery in that area. Seven Areas to Optimize Communication for Children with Hearing Loss Optimal Features for Pediatric Hearing Aid Fittings Audiologists who are providing highly effective care for children with hearing loss should consider how certain features on a hearing aid may facilitate communication. Some of the optimal features on current hearing instruments are straightforward. For example, most agree that every child should be fit with an instrument that contains a t-coil because this feature allows access to many assistive devices such as FM systems or neckloops, for cell phones, that may provide significant benefit. More information regarding the benefits of induction loops and the need for t-coils in hearing instruments may be found at www. Just as a t-coil feature opens many opportunities for children to access signal through induction loops, all hearing instruments recommended for children should have direct audio input DAI capability. This connection is particularly beneficial for accessing a signal from an FM receiver. Although most agree that features such as locking battery doors and deactivating the volume controls are worthwhile, the inclusion of automatic directional microphone technology has been debated. Some argue that a child may miss conversations from behind and experience a reduction in incidental learning. However, research has shown directional microphones can significantly improve speech recognition in noise Lewis et al. Longitudinal research is needed to provide support for this debate. In the meantime, one might argue that children should benefit from the greatest signal-to-noise ratio consistently throughout the day in order to learn from the primary source of information, the classroom teacher, who is typically talking in the front, rather than compromise this benefit to possibly learn some fraction of the day from a peer or teacher who is talking from behind. An illustrative software demonstration of the effects of various directional microphone response patterns is provided by Gennum at www. Therefore, verification via simulations is extremely important. All hearing aid test equipment provide programs to predict a target for amplification. An innovative method of quickly, easily and accurately measuring RECD has been described by Scollie Given the accuracy of these simulations and the sophistication of advanced hearing instrument circuitry, the use of aided thresholds is no longer considered a valid way to verify pediatric hearing aid fittings. Measuring thresholds at stimulus levels of 20 or 30 dB HL would invoke gains that may be entirely different from what the child experiences when listening to

conversational speech as digital hearing instruments handle a steady state signal very differently from speech. However, many educational programs need the "aided thresholds" as a routine part of the annual assessment. It is suggested that "predicted" aided thresholds be presented on the audiogram. These can be based on the real ear measurements of insertion gain. These "predicted" values can be recorded on the audiogram with an asterisk to indicate that the values are "predicted based on real-ear measures. Following verification of gain settings, time spent measuring speech recognition would be more useful than evaluation of aided thresholds. The speech recognition scores provide evidence that the amplified signal is proceeding through the instrument and actually interpreted by the child. This information can be extremely helpful to the educator in providing accommodations based on performance. It is important that conclusions regarding changes in performance be made with regard to statistical power. Often children are given a word list and a percent correct score is reported. Although the high variability in percent correct scores was pointed out by Thornton and Raffin , clinical decisions are often made without regard for statistical significance. However, according to tables provided by Thornton and Raffin such a difference for a word list does not reach statistical significance. Verification of hearing aid performance through the use of percent correct speech recognition measures will only be valid when the statistical variability is included. Demonstrations and downloadable charts are available at www. With the increase in ear level technology for cell phones, children are seeing more adults wear devices on their ears. The advantage of this is the social acceptance of devices at the ear, much like glasses are accepted for eyes. There are many cosmetic features to consider when selecting glasses compared to the solid colors that are offered for hearing aids. As society starts to wear something at the ear for purposes other than amplification, it might be possible that more cosmetic options would be offered. When this happens, audiologists will be asking the child which color, design, shape he or she would like to wear, much like an orthodontist gives a child an array of choices for a retainer. Imagine what the impact for child acceptance of amplification would be if they could choose a watermelon design or even better, a glow-in-the-dark hearing instrument! The paradigm, or view, of amplification is largely determined by the audiologist in the initial fitting. This in turn may be interpreted as this hearing loss is a negative aspect that should be hidden, a belief that can create a huge roadblock for accepting further accommodations such as neckloops or remote microphones. The more the family can be included as the audiologist displays excitement for the colors and styles of instruments and earmolds, the more likely the child will maintain a positive self-image while wearing the hearing instrument. Opportunities for students with hearing loss to share feelings with other students may facilitate acceptance of the loss. Message boards and other online resources are provided by the A. Bell Association for teens at www. Bell also provides similar support groups for parents they can be found at www. The clinical audiologist must be in contact with the educational system of the children they serve so that the hearing instruments selected for a child may be compatible with FM technology provided by the school. This may make the difference in a child having a body vs. It is also imperative that the school be informed of the need for the FM fitting evaluation to verify the FM and hearing aid settings are appropriate. The audiologist can also reinforce the benefits of the FM technology by asking how the hearing instrument is used at school with the FM. They may also be instrumental in teaching the child additional ways to benefit from their FM by using it to directly receive the signal from a classroom or home computer or other technologies. Many resources are available to support use of FM. Some are supported by manufacturers such as the eSchool Desk by Phonak at www. As schools expand services and children are increasingly served in the mainstream, there are instances where technology specialists rather than audiologists are given the task of selecting, ordering, and providing the FM system. Hopefully, prior to encountering a recommendation from the school, a parent would have discussed options with the audiologist and be prepared to request the appropriate equipment and the necessary FM fitting evaluation to ensure settings for optimal speech recognition. Hearing Instruments and Transitions from High School Parents of teens with hearing loss may have great fears of hearing complications during that first experience away from home. This may be a college dormitory or an apartment. There is much information to be considered to make this transition as smooth as possible and to take advantage of programs such as state supported "tuition grants. For those going to college, having met a counselor from the Office for Students with Disabilities can be very reassuring to not only the

student but also the parent. Providing this information may require a group setting or interaction with service providers at the university. The highly effective audiologist might keep an excel file of patients and their graduation dates, so they may be notified no later than the start of their senior year of special informational sessions on "Transitions after High School. Rather than trying to "hide" the devices so that such comments are not aroused, audiologists can teach the child and parent some ways to cope with such negative comments. In addition, children need to be learning skills to recover from communication breakdowns with a response other than "huh. Sam Trychin has provided workbooks that address several areas of coping and additional resources are available at Hear Again Publishing. Parents and older children may want to view this information at home through accessing information on the internet. A review of coping skills can be found at www. Negative phrases such as "you talked too fast, please repeat" are not as well received as neutral or more positive phrases. Hearing Instruments and Assistive Technology Equally important to the hearing instrument are the assistive devices that allow the child access to developing independence like a child would with normal hearing. Therefore, as soon as the child is old enough to understand the gesture for "come" and is independently mobile to the point of not always being in the same room with a caregiver, it is time to introduce the flashing smoke alarm. It would be unfortunate for a family to suffer a loss that might have been prevented had an audiologist recommended a flashing smoke alarm. Just as children develop independence by knowing the meaning of the flashing light for the smoke alarm, they should also be trained to waken independently. This may be accomplished via an audible signal, but may require a vibrating alarm clock. A tool for adults has been developed, known as the "TELEGRAM" to facilitate this interview process for assistive technology to guide audiologists to asking questions in all areas of potential communication difficulty Thibodeau, Perhaps through the use of a convenient tool such as this, the questions and possible solutions may be more readily addressed. Summary The seven habits of highly effective audiologists who serve children are interrelated and mutually supportive. Each one has an impact on the other six in some way as shown in Figure 1. For example, if the child is taught to hide the hearing instrument, he will most likely reject an FM system, not seek accommodations at college, avoid use of repair strategies, and reject larger instruments that have DAI and t-coil. If one of these areas is neglected entirely, the interrelations may become skewed and other areas may suffer. For example, if verification is ignored, the optimal acoustic characteristic may not be recommended and the child might miss important speech sounds and consequently reject not only the hearing instrument but also other assistive technology. Although audiologists may not practice all seven of the habits extensively, efforts may begin with directing the families to finding information on the internet or through written materials for those areas here-to-fore neglected. Likewise, many of these areas may be addressed through sharing information through parent discussion groups. As it becomes more routine for all audiologists to address these seven areas in service delivery, there will certainly be improved hearing health care for children and their families. Acknowledgements The author gratefully acknowledges the efforts of Au. Works Cited Bess, F. The minimally hearing-impaired child. Ear Hear, 6, Identification, assessment, and management of children with unilateral sensorineural hearing loss. Ear Hear, 7, Performance and management of children with unilateral sensorineural hearing loss.

Chapter 2 : Linda Thibodeau, PhD - UT Dallas - Callier Center - Audiology Hearing Loss Hearing Aid Rese

VITA Linda M. Thibodeau School of Behavioral and Brain Sciences Doctorate of Audiology Program EDUCATIONAL HISTORY Ph. D. - July, , University of Minnesota, Minneapolis, MN.

Erin Schafer at The University of North Texas developed to evaluate speech recognition performance in noise, such as "brush your teeth, "comb his hair", and "bend his knee". The children use a doll to act out the phrases they hear, so there is no confusion with intelligibility. This test can be used with a portable CD player, where the phrases are played from the front speaker 0 degrees azimuth and the noise from the rear speaker degrees azimuth. The FM transmitter microphone is placed six inches from the cone of the front speaker. Here is how we would use the results from this test. Then you add the FM system and you see the child responding at a 0 signal-to-noise ratio. This is a 10 dB improvement in the signal-to-noise ratio! I try to say things like "without the FM they hear my speech with about 10 units of noise. Then with the FM they can hear me with 10 additional units of noise meaning they can tolerate more noise like we have in the classroom". I try to put it in those terms. I think adaptive testing is a very useful tool for us and we need to be looking at it more for use in the clinic. Confidence levels for differences between speech-discrimination scores: Journal of Speech and Hearing Research, 23, Speech recognition in noise in children with cochlear implants while listening in bilateral, bimodal, and FM-system arrangements. American Journal of Audiology. Prior to that she worked at the University of Texas at Austin, at the University of Texas Speech and Hearing Institute, in otolaryngology clinics, and in the public schools. She teaches in the areas of Amplification and Pediatric Aural Habilitation. Her research involves evaluation of the speech perception of listeners with hearing loss and auditory processing problems as well as evaluation of amplification systems and assistive listening devices ALDs designed to help those persons. She consults with several school districts and manufacturers regarding FM arrangements in the classroom. She is a Contributing Editor for Audiology Online. Prior to that she worked at The University of Texas at Austin, at the University of Texas Speech and Hearing Institute, in otolaryngology clinics, and in the public schools. Her research at the Advanced Hearing Research Center of the Callier Center for Communication Disorders involves evaluation of the speech perception of listeners with hearing loss and auditory processing problems as well as evaluation of amplification systems and hearing assistance technology to help those persons. Related Courses 1 https: The topics for the week-long webinar series will be introduced including use of wireless technology with adults and children with hearing aids, cochlear implants, learning challenges, and traumatic brain injury. Tools for verification including professional standards and guidelines as well as techniques for ensuring appropriate outcomes will be presented. This webinar and the week-long series are based on a Seminars in Hearing special issue , Volume Thibodeau, PhD Recorded Webinar.

Chapter 3 : Audiology: Diagnosis - Google Books

Speech Audiometry Linda M Thibodeau. The Future of Diagnostic Audiology James F Jerger Alison M Grimes Gary P Jacobson Kathryn A Albright and Deborah.

Sign In or Create a free account to receive alerts. As children are identified earlier and fit with amplification or a cochlear implant at an earlier age, they are more readily entering mainstream education and closing the gap in their performance relative to their peers with normal hearing. This presents several challenges that must be addressed by both speech-language pathologists and audiologists who serve children with hearing impairments in the public schools. Three critical areas that can affect the success of a child with hearing impairment in the mainstream are: Professionals serving children with hearing loss in the schools can significantly affect these three areas and in doing so not only assist the child but also facilitate their own daily efforts to provide optimal intervention for those with hearing loss. For placement in the general education classroom there are three aspects of preparedness to consider: For children who use cochlear implants, good auditory skills are also important. Placing a child in the general education classroom without sufficient skills to be successful puts academic achievement at risk. Every child should be monitored carefully to determine if the placement meets the goals established for that child. Determining school readiness requires: Finally, parents who seek general education classrooms for their child should view this placement as a beginning rather than an end, ensure that the individual educational program IEP is a well-written contract, and be prepared to act as an advocate, especially for the younger child. Appropriate placement is critical relative to the two main academic challenges children with hearing impairment face in the classroom: English language development and literacy development. The specific challenges for language development include acquisition of spoken vocabulary and complex syntactic forms. Addressing the home language issue will require an orientation to supporting parents in language development techniques using their native language. The second major challenge for children with hearing loss in the schools is literacy development, which first entails learning to read and then reading with comprehension. In order to break the code, the child must have certain prerequisite skills that include the cognitive ability to process symbols, adequate audition to make use of phonetic cues, and sufficient language and experiences upon which new information can be interpreted. Reading comprehension is dependent upon having a substantial vocabulary and knowledge of complex linguistic forms supported by a rich experiential base, developing the ability to comprehend figurative language through critical thinking, and implementing metacognitive strategies. Children who develop a strong vocabulary will have increased access to learning additional vocabulary through reading because of their ability to learn new words in context. The ability to make inferences-to read between the lines-and to use metacognitive skills-to monitor understanding-will strengthen overall reading comprehension. In order for children to access language, break the code for reading, and acquire comprehension skills, assistive technology that provides access to auditory information is critical. With increased access, a child will gain a greater fund of knowledge that will lead to stronger language competence and therefore improved educational outcomes. As more children enter mainstream education, there are several technological issues that must be considered in order for these students to make optimal progress. Technology Considerations Many of the considerations regarding technology in public education are related to legal mandates. Meeting these needs requires access to communication. Communication access is more than simply understanding the teacher and being understood, but also includes understanding peers and being understood, tracking conversations between multiple speakers, effectively participating in individual and group discussion, and social interactions. There must be simultaneous access to multiple communication partners. In addition to a high-fidelity signal that automatically adjusts to a variety of communication situations and environments, it must also be consistent and interference free. The instrumentation must be user friendly and cosmetically acceptable. Finally, it must be capable of coupling to a variety of technologies such as phones and computers. This includes keeping abreast of current technology changes, validation techniques, and specific needs of special populations such as cochlear implant users. Training for general education teachers will also be important so that the technology can be maintained and function consistently without

interference. Failure to address these challenges may result in reductions in speech perception that, in turn, can lead to reduced comprehension and academic performance. These difficulties may then lead to increased social difficulties and ultimately low self-esteem. Appropriately fit assistive technology is a major component of access to communication because of its ability to reduce the deleterious effects of noise and reverberation. The process of getting assistive technology involves the following steps: Once these steps are completed, plans for technology maintenance are needed. The IEP needs to contain a statement describing who does the monitoring and how often it is checked as well as how parents are notified of any equipment malfunctions. They may be referred to as aural habilitation specialists because they are competent in training children with hearing loss and their families to maximize auditory communication. The responsibilities and roles of these professionals include communicating with parents, administrators, and teachers; presenting inservices; facilitating speech-language development; evaluating hearing; fitting and maintaining technology; managing noise; and offering parental support. It is only when the professionals are in regular communication regarding their re habilitation efforts that the child receives maximal reinforcement. This regular contact is facilitated by cross training among professionals so that there is mutual understanding of respective roles and approaches. Professionals who serve children with hearing loss must have common knowledge about communication, hearing loss, technology, families, and educational issues. Then each profession is trained in specific skill areas, shown in the Training Objectives sidebar, to provide necessary services to children with hearing loss. The SLP and audiologist must include the general education classroom teacher as part of the team, particularly as they work together to maximize the use of the assistive technology. The primary technology to facilitate auditory perception in the classroom is the use of an FM system to improve the signal-to-noise ratio. Audiologists must convey beneficial features of new FM technology such as directionality of transmitters and automatic frequency synchronization to easily change channels for individually-worn FM systems. Being able to change channels easily facilitates FM use in situations where classes change frequently such as in secondary schools or even in preschools where instructional centers are offered in different rooms. Use of ear-level FM technology may reduce complexity for the team, particularly when the school district purchases the complete ear-level FM receiver for each child. Although soundfield FM systems also reduce complexity, this discussion is focused on individually fit FM systems. In programs with basic FM systems, a child would remove his personal aids when he arrives at school and put on the FM arrangement provided by the school for use during the day. The school typically provides the earmolds and batteries to use with the basic FM system. At the end of the school day, the basic FM system is returned to the storage cabinet in the classroom and the personal aid is used at home. A basic, ear-level FM receiver may consist of a single unit or a three-component system. A single-unit FM system has the FM amplifier and receiver contained within the behind-the-ear case. Advantages and disadvantages of using basic, ear-level FM systems are provided in the Advantages and Disadvantages sidebar. Perhaps the most critical time to function as a team for teachers, SLPs, and audiologists occurs at the beginning of each new school year. Because audiologists are typically serving students in several schools, the teacher and SLP of the local school can help gather vital information to facilitate FM setup. Sharing the plan with teachers and SLPs will allow them to assist with appropriate channel use and troubleshooting accidental interference. Equipment verification, physically and electroacoustically, is another major effort in maximizing the benefit of FM systems for each student that can be facilitated by a team effort. SLPs may join audiologists in giving presentations in classrooms to the students regarding FM use. References to online resources for useful audio demonstrations and forms are provided in the Resources sidebar. Having students record their own serial numbers on inventory forms, when capable, and discussing the cost of the FM system in terms of equivalency to popular items e. Several electroacoustic tests may be done in the initial programming of the equipment to ensure the child is receiving an optimal FM advantage. The final type of verification that can be facilitated by the teacher and SLP is behavioral evaluation with the FM system in a sound-treated booth. The recommendations in the ASHA guidelines are to measure speech recognition in quiet and noise, with and without the FM system. Measurement of pure-tone thresholds is not recommended because of the difficulty in placing the FM transmitter in the soundfield to simulate the arrangement in the classroom. The teacher and SLP can be particularly helpful in arranging to send the FM

equipment with the child for the evaluation and providing information regarding language abilities so that appropriate test stimuli can be used. In summary, the child with hearing loss is optimally served by an educational team that has specialized training in aural habilitation. The professionals serving the child with hearing loss should be in frequent communication and working toward common goals that include maximal use of technology to access the auditory signal. Improvements in technology have led to opportunities to maximize reception of acoustic information in the noisy classroom through ear-level FM receivers. Verification may include daily checks, electroacoustic measures, or behavioral evaluation. Teachers and SLPs are key to successful use of technology to maximize language and literacy development. They can train and then reinforce the child for identifying equipment malfunctions. Most importantly, the team can provide immense psychological support for the child in the school setting. Programs that recognize success in a tangible way can generate positive peer support for technology. Students may like to gain recognition via stickers on their systems, putting charms on the earhooks, or choosing colors of earmolds. Such support systems are developed and maintained through recognition of the mutual contributions and frequent communication among the teacher, SLP, and audiologist serving the child with hearing loss. The contributions of Mary Ellen Nevins for that presentation and portions of this paper are gratefully acknowledged. FM manufacturers including Phonic Ear and Phonak generously provided FM equipment for trials to facilitate the development of many of the concepts presented in this paper. Training Objectives Students will have increased knowledge of: Guidelines for fitting and monitoring FM Systems.

Chapter 4 : Table of contents for Audiolog

Hearing aid manufacturer Phonak International selected Dr. Linda Thibodeau, a professor in the School of Behavioral and Brain Sciences (BBS), for its annual Cheryl DeConde Johnson Award for Outstanding Achievement in Educational and Pediatric Audiology.

Sign In or Create a free account to receive alerts. The FM system should no longer be considered an optional accessory to the cochlear implant speech processor, but rather as one of the basic components. To support this premise, the use of FM systems with cochlear implants will be addressed through five key questions. What are FM systems? An FM system consists of a transmitter with a microphone worn by the speaker and a receiver worn by the listener. The transmitter microphone options today include boom and lapel styles, as well as directional and noise reduction options, all of which add to the increased signal-to-noise ratio for the cochlear implant user. The FM receiver ranges from an integrated unit with the behind-the-ear cochlear implant speech processor to a body-worn small cube connected to the processor via a cord. The arrangement will depend on the options offered by the cochlear implant manufacturer. Why should FM systems be used? Although noise-reduction technology is incorporated into cochlear implants, this technology cannot compensate for the reduction in the speech signal that occurs as the distance from the speaker is increased. Who should use it? The premise of employing FM systems as a standard feature rather than as an accessory implies that it is appropriate for all cochlear implant users. Certainly adults and older children would be able to control the use of the FM system. However, there are some concerns that young children with limited language may not be able to reliably report the integrity of the signal; therefore, use of FM systems should be reserved only for older children. After the FM components have been verified independently of the cochlear implant Thibodeau, , the same techniques used to verify that the cochlear implant alone is functioning on a young child can be used to verify that the cochlear implant and FM system are functioning together. Where should it be used? The use of FM systems with cochlear implants is most often addressed in educational environments in which the noise level may interfere with learning new information. However, there are many additional possibilities for FM use that may have positive impacts in addition to improved speech recognition. When the cochlear implant user asks a group leader to wear the FM microphone, whether in a Girl Scout or city council meeting, they are letting others know the importance of good communication and displaying a positive model of self-advocacy. Furthermore, when FM systems are worn in public, they provides a strong message that the technology is helpful and not something to hide. Of course, inappropriate use of the FM system should be avoided, such as using the system as a remote communication device when the speaker and listener are not visible to each other. When should it be used? The answer is definitely not! Because listeners often are not in complete control of their acoustic environments or the speakers who wear the FM microphones, they must be prepared to listen in challenging situations. Cochlear implant users need to continue to develop listening skills in noisy environments, analogous to an athlete who includes incline training as part of preparing for a race. However, when learning new information, the increased signal-to-noise ratio provided by the FM system allows the cochlear implant user to focus on the new information without dividing cognitive resources with auditory processing in noise. Adult cochlear implant users will evaluate the acoustic situation to determine when to use the FM system, weighing the stress of listening in noise versus the importance of the communication. The research evidence supports the use of FM systems with cochlear implants to achieve significant benefits in speech recognition. The inability to listen to the signal when verifying FM systems, as is traditionally done when combining hearing aids with FM systems, should not be a deterrent in fitting these systems because there are numerous ways to verify FM components prior to connection to the cochlear implant Thibodeau, The FM system is most important in situations involving learning new information or listening in challenging acoustic environments; however, it should not be used exclusively, so that the cochlear implant user may become adept at listening in a variety of acoustic environments.

Chapter 5 : Audiology. Diagnosis - ECU Libraries Catalog

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Speech Recognition in Noise in Children With Cochlear Implants While Listening in Bilateral, Bimodal, and FM-System Arrangements Erin C. Schafer and Linda M. Thibodeau Author Affiliations & Notes.

Chapter 6 : Linda Thibodeau - UT Dallas Profiles

Linda M. Thibodeau, Ph.D. Welcome to my web site! I am a Professor at the. University of Texas at Dallas and work at The Advanced Hearing Research Center.

Chapter 7 : Serving Children With Hearing Loss in Public School Settings | ASHA News Leader | ASHA Pu

Linda M. Thibodeau, PhD, Guest Editor of this special issue of The Hearing Journal, is Associate Professor of Audiology at the University of Texas at Dallas, where she has been on the faculty since Previously she was on the faculty of the University of Texas at Austin for a decade.

Chapter 8 : - NLM Catalog Result

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