

## The University of Texas at Dallas/Callier Center for Communication Disorders Doctor of Audiology Program

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**Purpose:** The purpose of this article is to describe the history and resources of the doctor of audiology (AuD) program at the University of Texas at Dallas (UTD)/Callier Center for Communication Disorders, as well as to provide an overview of the program.

**Method:** Data from 1999, when the AuD program was approved by the Texas Higher Education Coordinating Program, to the present were reviewed.

**Conclusions:** The UTD/Callier Center AuD program includes more than 40 faculty members,

spans 3 campuses, and has 8 research laboratories. Total enrollment is 32 students (8 students are admitted each year for the 4-year program). Students have access to extensive resources and learning opportunities. The clinical and research programs at the UTD/Callier Center are actively involved in providing high-quality, in-depth education to future doctors of audiology.

**Key Words:** doctor of audiology, AuD, clinical programs, University of Texas at Dallas, Callier Center

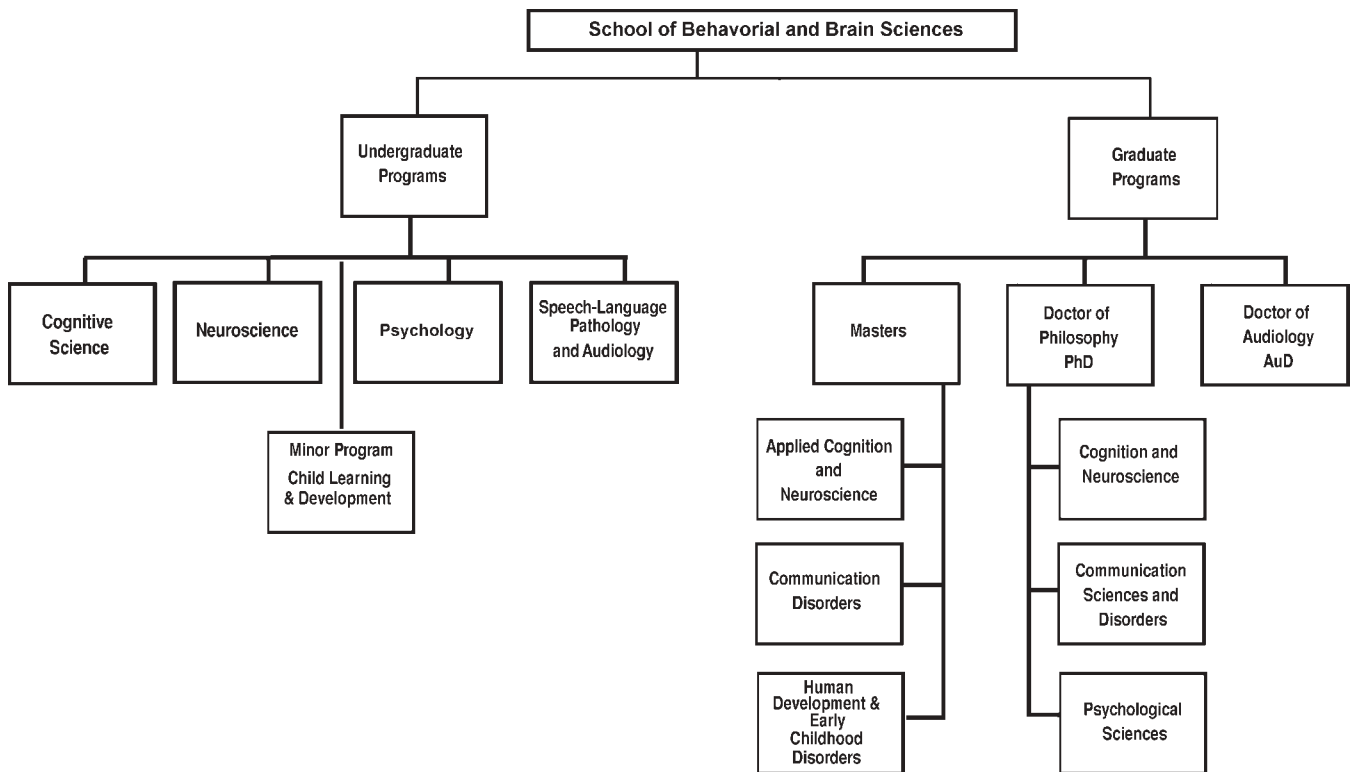
The doctor of audiology (AuD) program at the University of Texas at Dallas (UTD)/Callier Center for Communication Disorders reflects the integration and growth of two outstanding institutions. UTD opened in 1961 in Richardson, TX, as the Graduate Research Center of the Southwest (GRCS). GRCS joined the University of Texas system in 1969 as the UTD and offered only upper-division undergraduate (junior and senior classes) and graduate programs until 1989, when freshman and sophomore students were admitted. The Callier Hearing and Speech Center was incorporated in 1963 as a not-for-profit, community-based institution whose mission was to provide educational programs to children in Dallas County who were deaf, state-of-the-art clinical programs for children and adults with communication disorders, and basic and applied research programs in communication disorders. In 1972, the center became the Callier Center for Communication Disorders to reflect the increased scope offered by the programs.

In 1975, the Callier Center merged with the UTD, which was the impetus for the formation of the program in communication sciences and disorders at the university. The audiology and speech-language programs joined programs in cognition and neuroscience, psychology sciences, and

child development in the School of Human Development, recently renamed the School of Behavioral and Brain Sciences. This union afforded graduate students in audiology access to outstanding faculty, research laboratories, and clinical facilities with a diverse research base and broad patient population. In January 1999, the Texas Higher Education Coordinating Program approved the AuD program at UTD. In 2001, four students from the masters program transitioned into the AuD program, and the first AuD class of nine students was admitted.

Figure 1 shows the administrative structure of the UTD/School of Behavioral and Brain Sciences. As shown, the AuD program is one of three graduate programs within the school that also includes the masters and PhD degree programs. The three PhD programs and associated faculty are available to provide the broad spectrum of disciplines associated with audiology for the AuD students in the UTD/Callier Center program. The integrative nature of these programs also offers students in the newly established UTD/Callier Center AuD/PhD program the necessary broad spectrum of disciplines needed for clinical and research education. Currently, there are more than 1,000 undergraduate and 425 graduate students in the school; 32 students are enrolled in the AuD program, and 13 AuD degrees have been awarded to date.

Figure 1. Administrative structure of the UTD/School for Behavioral and Brain Sciences.



## Resources

Figure 2 provides the administrative structure of the UTD/Callier Center for Communication Disorders. The clinical, educational, and research programs in the UTD/Callier Center AuD program offer the AuD students a wealth of experiences. The resources and buildings within the Callier Center include the following:

*The Callier Center Dallas Campus* was the original site of the Callier Center. Occupying 5 acres adjacent to UT Southwestern Medical Center (UTSWMC), the facility consists of 10 buildings with more than 129,000 sq ft of space for clinical, educational, and research programs (see Figure 3).

*The Callier Center Richardson Campus* was dedicated in 2003 on the main UTD campus in Richardson, about 20 miles north of the Callier Center Dallas site. This facility is an extension of the programs at the Callier Center Dallas campus and occupies more than 23,500 sq ft (see Figure 4).

*The Advanced Hearing Research Center* opened in 2001, adjacent to the Callier Center Dallas, and houses state-of-the-art facilities for research in evoked potentials, cochlear implants, and amplification.

*The Center for Brain Health* began as a program in 1999 within Callier Center Dallas. Programs within this facility

focus on research, assessment, and treatment of the aging brain and related disorders. This program will be housed in its own facility by mid-2006.

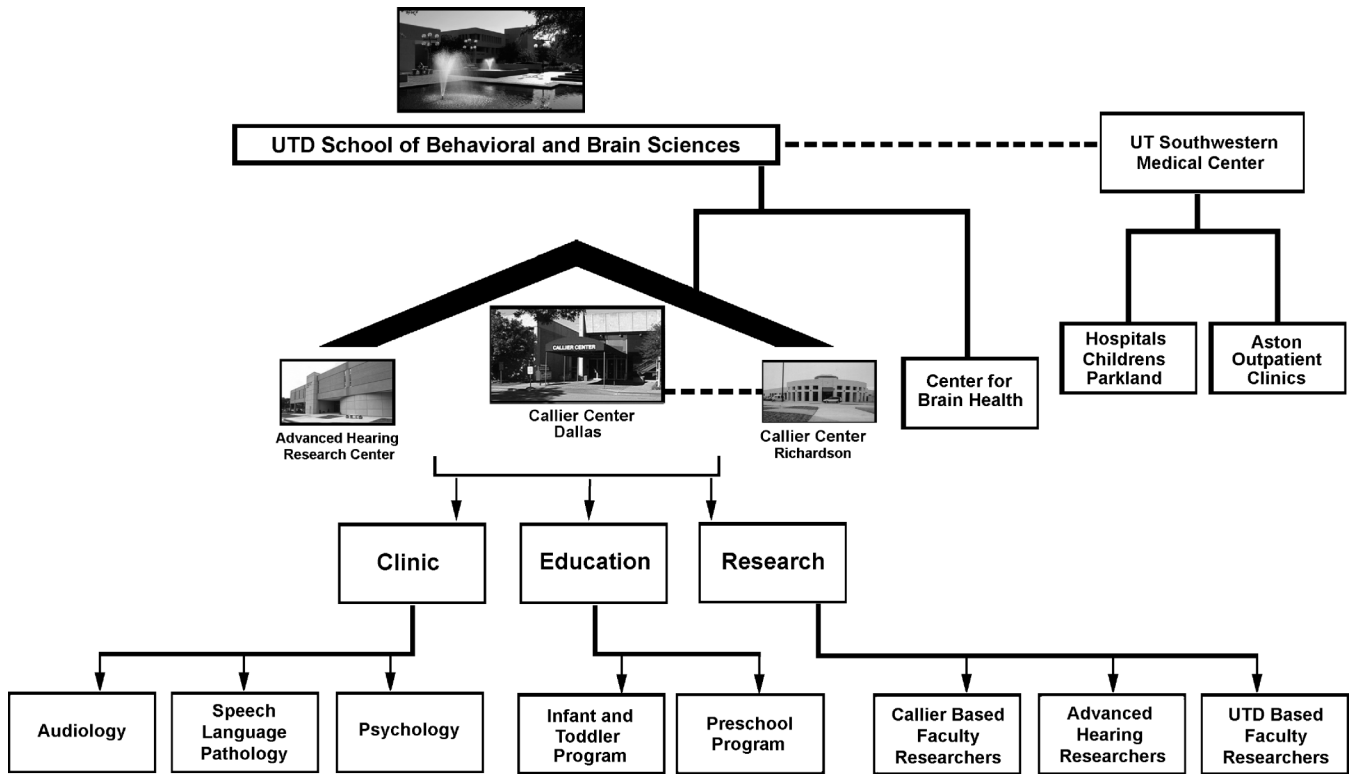
*UTSWMC* is a dynamic medical institution that has multiple hospitals, clinics, and research programs available for collaborative teaching and clinical and research experiences.

The UTD/Callier Center provides leadership in the field of audiology and was ranked in the top five audiology programs in 2004 by *U.S. News & World Report*. The programs and faculty at the center play a vital role in the medical and educational systems of the Dallas–Fort Worth area, serving the needs of those with communication disorders and providing rich education and research opportunities for students and researchers.

## Faculty

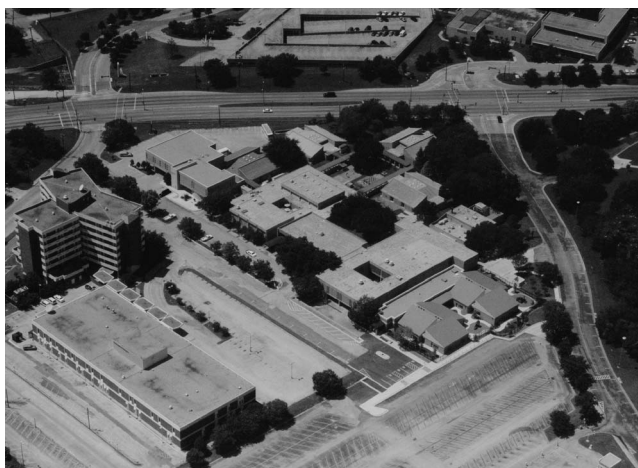
The UTD/Callier Center AuD program is fortunate to have the expertise of more than 40 academic and clinical faculty members from both the UTD and the UTSWMC. Most of the faculty have appointments in the School of Behavioral and Brain Sciences and teach at the Callier Center Dallas campus. In addition to clinical supervision, the faculty associates teach labs associated with coursework

Figure 2. Administrative structure of the UTD/Callier Center for Communication Disorders.



in diagnostics and rehabilitation offered in the first 2 years of the program. Faculty members at the UTD main campus in Richardson provide students with convenient access to activities in their respective research laboratories. Tables 1 and 2 provide a summary of the faculty's research and teaching expertise; see Figures 5 and 6 for photographs. Noteworthy is the wide array of diagnostic, (re)habilita-

Figure 3. The UTD/Callier Center for Communication Disorders, Dallas Campus.

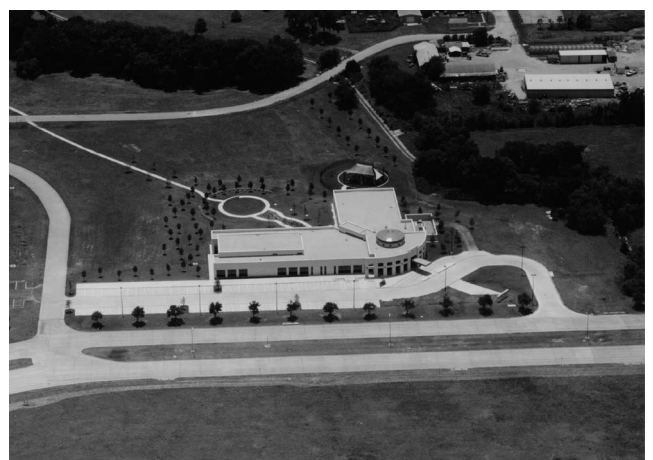


tion, and basic science interests represented by the AuD faculty.

### *Clinical Facilities and Programs*

The AuD program at UTD/Callier uses the clinic, laboratory, and educational facilities of both the Callier

Figure 4. The UTD/Callier Center for Communication Disorders, Richardson Campus.



**Table 1. Academic faculty.**

Academic faculty member	Location(s)	Research interest(s)	Class(es) taught
Peter Assmann, PhD	UTD main campus	Auditory and perceptual processes underlying speech communication	Speech Science
Jackie Clark, PhD	Callier Center Dallas	Pediatric audiology; auditory evoked responses and otoacoustic emissions	Diagnostic Audiology; Pediatric Audiology
Carol Cokely, PhD, Coordinator of Clinical Teaching	Callier Center Dallas	Adult aural rehabilitation; pediatric speech perception auditory processing disorders	Adult Aural Rehabilitation; Audiology Teaching Clinics; Journal Group
James Jerger, PhD	UTD main campus	Effects of aging on binaural auditory functioning; event-related potentials; brain mapping	Doctoral Seminars; Diagnostic Audiology
Michael Kilgard, PhD	UTD main campus	Plasticity and information processing in the auditory cortex	Auditory Plasticity
Mandy McGuire, PhD	UTD main campus; Callier Center Dallas	Child language development	Guest Lecturer; Child Language
Aage Moller, PhD	UTD main campus	Sensory physiology; neural plasticity	Anatomy/Physiology of Audition; Intraoperative Monitoring Guest Lecturer
Carolyn Musket, MA, Director of Assistive Device Center	Callier Center Dallas; Callier Center Richardson	Hearing assistive technology	
Karen Prager, PhD	UTD main campus	Clinical and counseling psychology	Counseling
Ross Roeser, PhD, Executive Director, Callier Center	Callier Center Dallas	Diagnostic audiology	Advanced Clinical Audiology; Physiological Assessment of the Vestibular System; Journal Group
Pamela Rollins, PhD	Callier Center Dallas	Child language development	Research Methods
Anu Sharma, PhD	AHRC	Neurophysiologic bases of speech perception; central auditory system development and plasticity	Clinical Electrophysiology; Auditory Processing Disorders
Angela Shoup, PhD, Director of Clinical Services	UTSWMC	Diagnostic and medical audiology	Medical Audiology
Linda Thibodeau, PhD, head of AuD program	AHRC; UTD main campus; Callier Center Richardson	Speech perception in persons with hearing disorders; hearing assistive technology; Dallas Cochlear Implant Program	Aural Habilitation; Theories of Amplification; Evaluation and Fitting Hearing Aids; Instrumentation; Journal Group
Emily Tobey, PhD	AHRC; UTSWMC	Speech perception and production; cochlear implants; hearing impairment	Cochlear Implants; Ethics In Research

Note. UTD = University of Texas at Dallas; AHRC = Advanced Hearing Research Center; UTSWMC = University of Texas Southwestern Medical Center.

Center Dallas and Callier Center Richardson campuses. The Callier Center Dallas campus has 10 double-walled audiometric testing suites for use in patient care and research and one suite dedicated to student education. The Callier Center Richardson campus has two double-walled audiometric testing suites. Each center is fully outfitted to perform adult and pediatric comprehensive evaluations. Both campuses are equipped with hearing aid and earmold laboratories, evoked potential equipment, otoacoustic emission systems, hearing aid analyzers, and real-ear systems. The Dallas facility also houses an electronystagmography laboratory and an ear-nose-and-throat examining room.

Three student computer labs at Callier Center Dallas and one at Callier Center Richardson provide access to the main UTD network, Callier patient information system, and the Internet. Students have easy access to computers for completion of clinic reports and academic assignments. The labs also support computer-based teaching aids such as audiometer simulators and sign language instruction. The Computer and Technical Services Division of the Callier Center operates a network of personal computers, servers, and printers to support the clinical, educational, research, and business functions of the center.

A variety of clinical programs located at both Callier Center campuses and at offsite facilities are available for AuD students. In addition to gaining experience in standard clinical diagnostic and rehabilitative services, students may participate in specialized clinics, including the Assistive Device Center, Center for Brain Health, Risk for Falling Clinic, and Tinnitus and Hyperacusis Clinic. Other unique clinical experiences available are the Learning to Live with Hearing Loss rehabilitation program, Dallas Cochlear Implant Program, Crystal Charity Ball Cochlear Implant Summer Camp, Summer Intensive Aural Rehabilitation Conference, and the Pediatric Aural Habilitation Specialization program. A description of these clinical programs is provided in Table 3. These programs provide outstanding service to the community and exceptional educational opportunities for our doctoral students.

### **Research Facilities and Programs**

Exposure to research activities is a main component of the UTD/Callier Center AuD programs so that students will learn to evaluate research critically. Research experiences are available at both Callier locations, the Advanced Hearing



**Table 2. Clinical faculty.**

Clinical faculty associate	Location(s)	Clinical specialty/program(s)	Class(es) taught
Paul Bauer, MD Jennifer Carlock, AuD	UTSWMC Callier Center Dallas; Callier Center Richardson	Dallas Cochlear Implant Program Infant hearing screening and follow-up; cortical evoked potentials	Guest Lecturer Electrophysiology Lab
Judy Demorest, AuD Beth Dorsey, AuD	Callier Center Dallas Callier Center Dallas	Infant hearing screening and follow-up Educational audiology	Electrophysiology Lab Aural (Re)habilitation and Amplification Labs Cochlear Implant Lab
Sarah Florence, MS	Callier Center Dallas	Dallas Cochlear Implant Program; educational audiology	Amplification Lab Diagnostic and Advanced Clinical Audiology Labs Vestibular Lab
Elizabeth Gill, MS Anne Howell, MS	Callier Center Dallas Callier Center Dallas	Adult aural rehabilitation Tinnitus and Hyperacusis Clinic	Amplification Lab Diagnostic and Advanced Clinical Audiology Labs Vestibular Lab
Cindy MacArthur, MS	Callier Center Dallas	Risk for Falling Clinic; Learning to Live with Hearing Loss; community outreach	Guest Lecturer
Kathy Martin, BS, research audiologist, Auditory Cortical Function Laboratory Brisy Northrup, AuD	AHRC Callier Center Dallas	Cortical evoked potentials; Dallas Cochlear Implant Program	Amplification Lab
Gary Overson, MS Myrna Powell, AuD	Callier Center Richardson Callier Center Dallas	Educational audiology; evoked potentials Educational audiology; genetics	Instrumentation Lab Amplification Lab and Audiology Teaching Clinic Guest Lecturer
Peter Roland, MD, Chief of Otolaryngology Diana Terry, MS	UTSWMC Callier Center Dallas	Neurotology; Dallas Cochlear Implant Program Speech language of hearing impaired; cochlear implants; Dallas Cochlear Implant Summer Camp	Auditory Verbal Methods
Janeé Willett, MA Phillip Wilson, AuD, Director of Audiology Services	Callier Center Dallas Callier Center Dallas	Dallas Cochlear Implant Program Auditory processing disorders; Dallas Cochlear Implant Program	Cochlear Implant Lab Professional Issues in Audiology; Physiological Assessment of the Vestibular System

Research Center, UTD main campus, and the UTSWMC. A summary of research laboratories is provided in Table 4. The Callier Center Dallas campus has three acoustically and electrically isolated chambers for electrophysiological brain research, employing acoustic stimulation of animals and humans; a brain-mapping laboratory; a large double-walled anechoic chamber; a state-of-the-art speech science laboratory; and a histology

**Figure 5. Nineteen of the 31 UTD/Callier Center academic and clinical faculty members.**



laboratory for optical microscopy, tissue staining, and validation of electrode placement.

In addition to the extensive library at the Richardson UTD campus, the Callier Center Dallas campus also has a library containing more than 3,500 books and monographs. The library's computer terminals and workstation allow students access to many electronic databases and full-text articles.

**Figure 6. Audiologists at the close-by UT Southwestern Medical Centers Department of Otorhinolaryngology-Head and Neck Surgery who act as adjunct faculty for the AuD program.**



**Table 3. Clinical programs.**

Program	Location	Population	Services
Assistive Device Center	Callier Center Dallas; Callier Center Richardson	Any individual with hearing loss	Demonstration, selection, provision of systems for telecommunication, TV, personal, group, alerting
The Center for Brain Health	Callier Center Dallas	Any individual with injury/disease of the brain	Assessment, referral, intervention, support groups to promote understanding, protecting and healing of the brain
Crystal Charity Ball Cochlear Implant Summer Camp	Camp facility within 20 miles of Dallas-Fort Worth area	Children age 3–12 who use cochlear implants	Listening and speaking skills emphasized in camp environment
Dallas Cochlear Implant Program	Callier Center Dallas; UTSWMC	Children and adults with severe hearing loss or auditory neuropathy and their families	Pre- and postevaluations; mapping; speech-language therapy; auditory-verbal training
Independent School District Contracts	Plano ISD; Dallas ISD; Callier Center Dallas	Children, age 6 weeks through high school with hearing loss	Diagnostic evaluation; FM fitting, verification of benefit, troubleshooting; FM-cochlear implant coupling; self-contained and mainstreamed educational environments; teacher in-service
Learning to Live with Hearing Loss	Callier Center Dallas	Adults with hearing loss and communica- tion partners	Four classes on aural rehabilitation emphasizing hearing aid maintenance, troubleshooting, coping skills, communication strategies, and legal rights
Pediatric Aural Habilitation Specialization	School districts within Dallas-Forth Worth area	Elementary school	Two-year training specialty; enhanced experiences in educational audiology, cochlear implants, amplification, language development
Psychology Services	Callier Center Dallas; Callier Center Richardson	Children and adults	Diagnostic evaluation and treatment of children with APD and adults with tinnitus/hyperacusis
Risk for Falling Clinic	Callier Center Dallas	Older adults	Comprehensive assessment; intervention plans to reduce risk for falling and to sustain active lifestyle
Tinnitus and Hyperacusis Clinic	Callier Center Dallas	Teenagers and adults	Assessment; tinnitus retraining therapy
Summer Intensive Aural Rehabilitation Conference	Callier Center Richardson	Adults with hearing loss and communica- tion partners	Five-day conference for cooperative learning in social environment; audiologic, hearing aid, communication needs assessments; auditory/visual training; com- munication strategies; trials with new technology

Note. ISD = Independent School District; APD = auditory processing disorders; FM = frequency modulation.

The Callier library is staffed by a professional librarian who has expertise with resources in the field of communication disorders and who infuses information literacy into the AuD curriculum through presentations regarding navigating electronic databases, Web resources for audiology, plagiarism, and scientific writing. The UTD/Callier Center librarian and resources greatly facilitate students in their research and coursework responsibilities. The UTSWMC library, only a short walk from the UTD/Callier Center Dallas campus, is also available for AuD students.

## Program Overview

### Admissions and Enrollment

The admissions committee for the UTD/Callier Center AuD program reviews applications beginning in September of the prior academic year. Early admission into the program is granted to students who have outstanding profiles on the following: the application, undergraduate grade point average (GPA), Graduate Record Examination (GRE) score, letters of recommendation, and a personal statement. Although the minimum GRE score for graduate programs at

UTD is 1000 for combined verbal and quantitative scores, admission is based on all five factors outlined above.

The average student admitted into the UTD/Callier Center AuD programs has an undergraduate GPA of 3.45 and a GRE score of 1145. Targeted enrollment is 8 to 10 students in each year of the program. The demographics of the 45 students admitted to date include: 43 female and 2 male; 40 Caucasian, 2 African American, and 3 Hispanic; and 29 Texas residents and 16 nonresidents. No AuD student has discontinued the program, highlighting the caliber and dedication of the students and faculty associated with the program.

### Curriculum

The coursework as outlined in Table 5 reflects the comprehensive nature of the education in audiology provided to the AuD students. The core courses during the first 2 years are supplemented by 1-credit laboratories. In this way, learning is facilitated by substantial hands-on and problem-solving activities in the areas of diagnostics, amplification, and aural (re)habilitation. As students progress in the programs, they may pursue courses in related disciplines

**Table 4. Research facilities.**

Laboratory/director	Location	Research	Laboratory facilities
Auditory Cortical Function Laboratory/Anu Sharma	AHRC	Electrophysiology; effects of auditory deprivation on plasticity and development of central auditory pathways in children with auditory impairment	Two sound suites; two 32- and 64-channel electroencephalograph amplifier and evoked potential stimulus delivery; Neuroscan electroencephalograph data acquisition, stimulus delivery, and data analysis
Auditory Processing Laboratory/Linda Thibodeau	UTD main campus	Evaluation of speech processing in noise; benefits of assistive technology	Tucker-Davis Technologies Array Processor; specialized psychoacoustic software to generate/analyze synthetic speech
Children's Speech Processing Laboratory/Susan Jerger	UTD main campus	Speech perception in children with hearing impairment	Standard and specialized speech audiometry; speech perception and visual reaction time measurements
Cochlear Implant Laboratories/Emily Tobey	AHRC; UTSWMC	Speech perception, production for cochlear implant users; brain mapping	Brain imaging; mapping acoustic analysis; speech synthesis and acoustic analysis
Sensory Aid Laboratory/Linda Thibodeau	AHRC	Evaluation of hearing aid, assistive technology; auditory processing of complex signals	Sound suite; two Fonix 6500X, two FP40, and two Verifit hearing aid test systems; Tucker-Davis Technologies Array Processor; specialized psychoacoustic software to generate/analyze synthetic speech
Speech Laboratories/Emily Tobey	AHRC	Speech perception; speech reading; speech movement; physiology of speech production	Acoustic and kinematic recording and analysis; physiology measurement of volume, airflow, laryngographic movement, electromyography
Topographic Brain Mapping Laboratory/James Jerger	UTD main campus	Auditory and visual electrophysiological indices of processing deficits	Thirty-two-channel Neuroscan; generation, recording, calibration of acoustic stimuli

such as psychology, cognition and neuroscience, and rehabilitation counseling. Students benefit from the expansive research opportunities at the UTD/Callier Center, in that their 2nd and 3rd years are marked by three research courses (Research Methods and two semesters of Individual Research in Audiology). Other requirements of the research experience include weekly Auditory Perception Journal Group, participation in the editorial process of a peer-reviewed research journal, giving oral presentations of pilot research projects, and writing research papers in journal article format.

During their 2nd and 3rd years, students select a faculty research mentor as part of their research requirement and carry out a project under the mentor's supervision. Students are required to present their research projects orally to the UTD/Callier Center faculty at the end of the fall and spring semesters during their 3rd year and to submit a written paper (following the guidelines of the *Publication Manual of the American Psychological Association*) prior to graduating from the program. Several of the students have had their projects published in peer-reviewed journals and/or have presented them at professional meetings. Additional descriptions of the many research programs at the UTD/Callier Center are provided in the next section.

During the 4th year, students spend a 12-month externship at a facility mutually agreed upon by the student and Coordinator of Clinical Teaching that provides appropriate

breadth of services, variety in patient population, and experienced mentors. The AuD curriculum is strengthened by the clinical and research programs offered by faculty with expertise in diagnostics, electrophysiology, amplification, auditory processing, assistive devices, cochlear implants, and educational audiology.

### ***Guided Learning and Laboratory Experiences***

The UTD/Callier Center AuD program provides systematic connections between theory presented in the classroom and application to clinical populations. This occurs in two structured ways during the first 2 years of core instruction. Students meet 3 hr per week in Audiology Teaching Clinics and another 3 hr per week in Didactic Labs. These experiences are offered in addition to their regular clinic rotations each semester.

*Audiology Teaching Clinics.* AuD students are enrolled in Audiology Teaching Clinics during their first 3 semesters. Teaching Clinics are designed to provide hands-on experience with volunteer patients in a controlled learning environment that facilitates planning, integration, and clinical decision making. The Adult Teaching Clinic during the fall semester draws volunteers from current and retired UTD faculty and staff who suspect hearing loss and from patients with early-stage dementia from Callier's Center for Brain Health. Volunteers are triaged so that those with normal hearing to minimal loss are seen early in the

**Table 5. Curriculum.**

Semester	Course	Credit hours
Fall I	AUD 6305 Anatomy and Physiology of Audition	3
	AUD 6303 Hearing Science	3
	AUD 6310 Advanced Clinical Audiology	3
	HCS 7380 Practicum	3
	AUD 6120 Lab	1
Spring I	AUD 6316 Adult Aural Rehabilitation	3
	AUD 7326 Aural Habilitation	3
	AUD 6311 Diagnostic Audiology	3
	HCS 7380 Practicum	3
	AUD 6120 Lab	1
Summer I	AUD 6318 Pediatric Audiology	3
	AUD 6352 Medical Audiology	3
	HCS 6314 Instrumentation	3
	HCS 7380 Practicum	3
Fall II	AUD 7321 Theories of Amplification	3
	HSC 6312 Research Methods	3
	AUD 7324 Cochlear Implants	3
	HCS 7380 Practicum	3
	AUD 6120 Lab	1
Spring II	AUD 7353 Clinical Electrophysiology	3
	AUD 6306 Speech Science	3
	AUD 7327 Evaluation and Fitting of Hearing Aids	3
	HCS 7380 Practicum	3
	AUD 6120 Lab	1
Summer II	AUD 7351 Physiological Assessment of the Vestibular System	3
	AUD 7382 Hearing Conservation First Elective	3
	HCS 7380 Practicum	3
		3
Fall III	AUD 7310 Professional Issues in Audiology	3
	AUD 7371 Doctoral Seminar – Auditory Processing Disorders	3
	AUD 7371 Doctoral Seminar – Auditory Plasticity Second Elective	3
	HCS 7380 Practicum	3
	AUD 8380 Individual Research in Audiology/Elective	3
Spring III	AUD 7371 Intraoperative Monitoring	3
	COMD 6348 Counseling	3
	AUD 7371 Doctoral Seminar Third Elective	3
	HCS 7380 Practicum	3
	AUD 8380 Individual Research in Audiology/Elective	3
Summer III– Fall IV– Spring IV	AUD 8607 Externship	6
Fall IV	AUD 8607 Externship	6
Spring IV	AUD 8607 Externship	6
<i>Electives<sup>a</sup></i>		
Spring	HCS 6310 Functional Brain Imaging	
Spring	AUD 7371 Intraoperative Monitoring I	
Spring	AUD 7371 Intraoperative Monitoring II	
Fall	AUD 7371 Presbycusis	
Fall	AUD 7371 Cognitive Neuroscience	
Fall	AUD 7371 Auditory Plasticity	
Summer	COMD 7323 Auditory Verbal Methods	
Fall	HCS 6346 Integrative Neuroscience	
MayMester <sup>b</sup>	HCS 8350 Ethics in Research	

<sup>a</sup>Three required; offering times may vary but typical semesters are indicated.

<sup>b</sup>A 2-week period in May between the Spring and Summer semesters.



semester. During the spring semester, UTD students participate in the Pediatric Teaching Clinic and benefit from the availability of infants, toddlers, and preschoolers from the Callier Preschool. The Auditory Brainstem Response Teaching Clinic is the final volunteer clinic and takes place during the summer semester when volunteers with known hearing loss and/or medical conditions are seen for threshold pursuit and neurodiagnostic evaluation. Audiology Teaching Clinics afford students the time to explore various protocols and techniques and to improve efficiency in a collaborative learning environment.

*Didactic Labs.* AuD students participate in four Didactic Labs that complement core courses during the first 2 years of the program. Academic and clinical faculty direct the laboratory experiences with support from 4th-year Audiology Externs. Each lab session is divided into two 75-min sections. In the fall, 1st-year AuD students participate in the lab that accompanies the Advanced Clinical Audiology course as well as a lab that serves as an Introduction to Hearing Aids. Labs that accompany the Diagnostic Audiology class and the Adult and Pediatric Aural (Re)Habilitation courses are completed in the spring semester of the 1st year. Laboratory exercises provide practice for conventional techniques as well as foster understanding of the relationship between important test variables and patient outcomes. Second-year AuD students continue to benefit from laboratory instruction as they complete coursework in Theories of Amplification and Cochlear Implants during the fall semester and Evaluation and Fitting of Hearing Aids and Clinical Electrophysiology during the spring semester. The 2nd-year amplification labs include volunteers for hearing aid fitting and verification exercises. These experiences enhance students' expertise with complex equipment and various protocols that greatly facilitate problem solving and case management skills in structured settings prior to application in real clinical situations.

### **Clinical Experiences**

AuD students at UTD benefit from the rich clinical environment at the Callier Center and from the university's affiliations with other service providers within the Dallas-Fort Worth area during Years 1–3 of the program. Each semester, students are placed in rotations for 16 hr per week. Students obtaining their AuD at UTD satisfy requirements necessary to obtain the Certificate of Clinical Competence in Audiology from the American Speech-Language-Hearing Association. Semester-long clinic rotations provide access to the wide breadth of services and populations necessary to gain knowledge and skills commensurate with the current scope of practice in audiology.

Students are placed almost exclusively with Callier Center preceptors during the first 2 semesters, either in the general diagnostic and hearing aid rotations or in school districts with which the university has contracts or affiliations. Students' clinical responsibilities increase as coursework and lab experiences provide theoretical rationale and clinical protocols. By the 2nd year, students participate in specialty placements, including the Cochlear Implant Program, Tinnitus and Hyperacusis Clinic, neonatal screen-

ing follow-up, and industrial audiology. By the 3rd year, rotations are added in hospitals, private practices, and otolaryngology offices.

UTD is fortunate to be affiliated with UTSWMC, which includes Children's Medical Center, Parkland Hospital, and Aston Outpatient Center. Options for student placements include more than 30 different sites. Students spend approximately 800–1,000 hr in direct contact with patients or completing client-related clinical activities during their first 3 years in the programs, ensuring that their clinical experience is well rounded. Whereas competency, independence, and professionalism are carefully evaluated by preceptors, students' self-assessment of accomplishments and goals plays an important role in practicum placement.

The 12-month externship begins the summer of the 4th year. To date, we have placed three cohorts across the country and in Australia at the National Acoustics Laboratory. All prospective externship sites must be approved by the Coordinator of Clinical Teaching to ensure that they provide sufficient exposure to an array of services and populations as well as appropriate supervision. Frequent contact is maintained with the students and preceptors, and externs participate in monthly online discussions or conference calls that provide updates on professional issues. The monthly meetings are also forums for connecting clinical experiences with coursework through discussions with faculty and guest speakers, and they provide an opportunity for students to maintain contact with their classmates.

### **Assessment of Knowledge and Skills**

In the fall of the 2nd year, students participate in the Performance Assessment of Skills (PAS). Under the observation of two preceptors, each student completes an independent and comprehensive evaluation of an adult with known hearing loss, although unknown to the student. Following the evaluation, preceptors and student share a dialogue about clinical decisions. Throughout the 2nd year of the programs, students also must demonstrate competencies in pediatric assessment, amplification, and measurement of auditory brainstem response. The PAS evaluation and other competency checks help students and faculty recognize student strengths, update performance goals, and determine remediation needs.

Prior to the 4th-year externship, students must successfully complete a formative assessment of academic knowledge that consists of 2 half days of written exams. Successful completion of the assessment indicates synthesis of underlying principles of hearing science, research, and clinical practice across the scope of diagnostic and (re)habilitative audiology. AuD faculty provide feedback in all content areas, and students address any weaknesses before beginning the 4th-year externship.

### **Unique Aspects of the UTD/Callier Center AuD Program**

Several unique features of the UTD/Callier Center AuD program enhance education, facilitate knowledge of the

field, and foster inclusion in professional activities. Students may find that one or more of these features significantly affects their decision for graduate study. These features include the following:

- **Journal editors:** Two UTD/Callier Center faculty members are Editors-in-Chief of professional journals: *The International Journal of Audiology* and *The Journal of the American Academy of Audiology*. As part of the research requirements, AuD students learn the procedures involved in the peer review process, including editing of manuscripts and management of revisions.
- **Clinical populations in the Dallas–Fort Worth area:** The combination of on-campus facilities and specialty clinics that provide more than 70,000 patient visits annually as well as off-campus placements around the Dallas–Fort Worth area provide AuD students with considerable breadth in clinic exposure. Given the number and variety of options, students are able to pursue special interests. For example, students interested in pediatric habilitation can be placed in the Callier Preschool, in school districts outside of Dallas, and in pediatric hospitals in Dallas and Fort Worth. The Dallas–Fort Worth area also affords specialized experience in adult populations through the Veterans Administration hospital, industrial sites, and state programs for the deaf and hard of hearing. Likewise, students wishing cochlear implant rotation beyond the Callier Implant Team may be placed in two other cooperating sites where implant surgery, programming, and follow-up are available.
- **Bruton Conferences in communication disorders:** The Callier Center benefits from an endowment dedicated to the continuing education of the speech and hearing professionals and students. Bruton Conferences are held each semester and allow students to learn from prominent leaders in the field. Past topics have included evaluation and management of auditory processing disorders, psychological impact of hearing loss, hearing conservation, hearing loss and literacy, and enhancing speech recognition through the use of clear speech.
- **Multidisciplinary research environment:** Students may take advantage of the rich research environments in the School of Behavioral and Brain Sciences or at UTSWMC by taking courses and engaging in research activities in cognition and neuroscience, psychology, and vocational counseling, for example.
- **Video-link connection between campuses and the world:** Learning opportunities are enhanced by the video-link of lecture series, journal groups, and research presentations between the two campuses, as well as other facilities with similar facilities. Because clinical practicum and academic courses are offered at both locations, the video-link facilitates participation in these events.
- **Graduate student support:** In addition to traditional graduate stipends that are provided to all AuD students, about half of the AuD students receive support through a clinical or research program. Funding is provided through

grants that include training and research emphases. Students may also apply for positions as assistants in the Regional Day Schools for the Deaf, Assistive Device Center, or hearing aid dispensary.

- **On-site day care:** Students with infant or preschool children have access to outstanding day care facilities. The 2–6-year-old classrooms are combined with the Dallas Regional Day School for the Deaf so that children with normal hearing have the opportunity to benefit from a total communication environment.
- **AuD/PhD program:** UTD offers a framework for graduate students to concurrently pursue a research and a clinical doctorate in audiology. While some courses overlap, the research experiences are designed to guide the student toward independence in theoretical critique, hypothesis generation, data collection, and analysis. AuD/PhD students also are mentored in research dissemination and grant writing.

### Summary

The UTD/Callier Center has been providing audiology education for the past 30 years; in 1999, the UTD/Callier Center began offering the AuD degree. The programs at the UTD/Callier Center are extensive in their breadth and depth as they include more than 40 faculty members and 8 research laboratories, and span 3 campuses. AuD students are selected based on recommendations, letters of interest, GPA (typically 3.5 or higher), and GRE scores (typically 1100 or higher). For the first 3 years, students complete academic and clinic requirements, a research experience, and written and practical exams. Mentoring continues during their 4th-year externship through frequent contact and monthly online discussions. Graduates of the program have been successfully employed in medical facilities, speech and hearing centers, private practice, and educational settings.

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Prospective students are encouraged to visit the faculty and the campuses during the application process. Additional information can be found on the UTD/Callier Center Web sites at [www.callier.utdallas.edu](http://www.callier.utdallas.edu) and [www.callier.utdallas.edu/AUD.html](http://www.callier.utdallas.edu/AUD.html). Those wanting additional information should contact Linda Thibodeau, Professor, Head of the Doctorate in Audiology Program, UTD/Callier Center, 1966 Inwood Road, Dallas, TX 75235. E-mail: [thib@utdallas.edu](mailto:thib@utdallas.edu)

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