

NETAC networks

Providing technical assistance to professionals working with students who are deaf and hard of hearing in postsecondary settings
February 2004

Accommodating college students with cochlear implants

by Catherine Clark

Although cochlear implant technology may seem new, it has existed for over 30 years. A cochlear implant is an electronic device implanted in the cochlea of the ear and is designed to provide useful hearing and improved communication ability to individuals who could not benefit from the most powerful hearing aids.

Cochlear implants do not restore hearing to "normal."

Today there are over 30,000 individuals with cochlear implants in the United States. Over 10,000 are children. Cochlear implant manufacturers are predicting a 20-25% growth annually due to improvements in cochlear implant technology, its effectiveness, and the expanding cochlear implant candidacy criteria. Given this trend, colleges will see increasing numbers of students with cochlear implants. This article will address questions from disability support services staff about cochlear implants and their impact on college campuses.

How does a cochlear implant differ from a hearing aid? For persons with a permanent severe or profound hearing loss, hearing aids use amplified sound to stimulate the

damaged hair cells of the auditory nerve in the cochlea. However, the damaged hair cells decrease the auditory nerve's ability to carry information to the brain. Cochlear implants bypass the damaged hair cells by providing direct electrical stimulation of the auditory nerve via electrodes implanted in the cochlea. They do not restore hearing to "normal."

Let's trace a sound through an implant: 1) Sounds are picked up by a small ear-level microphone. The microphone changes the sound into an electrical signal. 2) The external speech processor (a mini-computer) filters, analyzes, and digitizes the sound into coded signals. 3) The coded signals are sent from the speech processor to the external transmitting coil via a cable. 4) The external transmitter has an antenna and a magnet. The coil sends the coded signals as FM radio signals to the implanted receiver/stimulator under the skin. 5) The receiver/stimulator also has a magnet to secure a connection with the external transmitter. The receiver/stimulator decodes the signal and delivers the appropriate electrical energy to the implanted electrodes near the auditory nerve in the cochlea. 6) The electrodes stimulate the remaining auditory nerve fibers. 7) The resulting electrical sound information is sent through the auditory system to the brain for interpretation. The brain's challenge is to interpret the electrical



code as meaningful auditory information for environmental and speech cues.

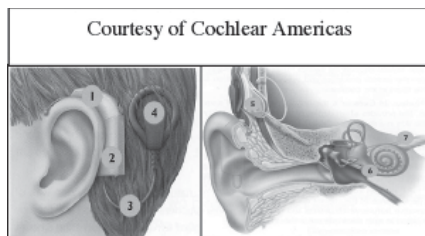
Who can you expect to see with an implant at college? Students with cochlear implants may have received an implant in preschool, elementary, secondary school, or while in college. Therefore, college students with cochlear implants will vary greatly in their backgrounds based on the generation of the technology and length of the

cochlear implant experience. At the National Technical Institute for the Deaf (NTID), over 100 students with cochlear implants enrolled this year. We have students implanted at age 3 studying along with those who received an implant last month at age 22.

How much will the student with a cochlear implant hear? No one can currently predict how much benefit an adult or child will receive from a cochlear implant. Several factors appear to be significant contributors: duration of deafness, auditory memory, number of functioning auditory nerve fibers in the cochlea, cochlear implant experience, fine tuning (mapping) of the implant, and rehabilitation and/or educational programs. Auditory and spoken language benefits largely depend on the student's background and experience using a cochlear implant.

Current FDA guidelines state that a deaf child between the ages of 1 to 17 who demonstrates a lack of auditory progress may be eligible for a cochlear implant candidacy evaluation. Therefore, deaf students with cochlear implants represent a broad range of auditory, speech, speechreading, sign language, literacy, and cognitive abilities pre- and post-implant.

What about the cochlear implant users who reportedly can follow conversations on the radio? These adults were postlingually deafened and were born with normal auditory development, grew up hearing, or had a progressive loss. They developed spoken language through audition and had an auditory memory for sound before becoming deaf. The brain relied on its auditory memory to quickly recode the electrical signal provided by the



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The Director's column

by Dianne Brooks

The advent of the 2004 New Year is a reminder that soon NETAC will be starting its ninth year of operation. This is a good time to pause a bit and take stock of some of the "milestones" NETAC has achieved since its inception back in 1996. Certainly these past several years have been an exciting time of continuous growth and many successful and far-reaching accomplishments in NETAC's efforts to enhance educational access and opportunities for students who are deaf and hard of hearing. In compiling this list of significant outcomes, we asked for feedback from our site coordinators, consortium members, and others. Essentially, we wanted to know how NETAC has made a difference with the various audiences we serve.



A NETAC network – NETAC has established a network of participating educational institutions throughout our region. Every state has an assigned site coordinator who is also affiliated with a host institution such as a postsecondary educational institution or community-based service organization. This structure allows NETAC a major channel through which its outreach and training activities are widely exported to the local level. It also allows for an effective means by which NETAC can develop and implement its outreach programs specific to the needs and concerns of individual states. NETAC site coordinators are all well qualified educators and service professionals who work closely with the NETAC central office to implement annual scope of work initiatives.

NETAC consortia – NETAC consortium boards have been established and are integral parts of each local NETAC network. Currently more than 360 professionals regularly volunteer their time to participate in 13 consortium boards throughout the NETAC region. Consortium members include administrators, rehabilitation personnel, students, educators, and disability service providers, to name a few. The consortia not only serve as advisory bodies, meeting twice yearly, but members also dedicate their time and energy to actively engaging in and furthering the work of NETAC. In some cases the consortium meetings have evolved into statewide events that participants hail as excellent professional development opportunities through which to share information and best practices strategies, as well as to establish new partnerships.

NETAC outreach and training activities – Over the past several years, NETAC has provided innumerable outreach and training activities, including workshops, conference presentations, and individual consultations. These activities are aimed at skill building and engaging service providers, educators, students, parents, and the general public in learning more about such issues as access and accommodations, communication needs, instructional tools, and new technology, to name just a few of the many areas essential to enhancing educational opportunities for deaf and hard-of-hearing students.

The **NETAC Professional Internship Program** in particular has provided many professional development opportunities for professionals in the NETAC region to interact directly with other professionals both regionally and nationally and to experience, firsthand, best practice methods, state-of-the-art materials development and use, and new technological advancements for use in providing access and accommodations to deaf and hard-of-hearing students in the classroom.

C-Print® outreach and training – Perhaps one of the most significant outreach and training activities NETAC has helped pioneer is the training of C-Print captionists across the country. C-Print technology was developed at the National Technical Institute for the Deaf in 1989. A "train-the-trainer" model was added as the demand for trained captionists continued to soar. Today hundreds of C-print captionists have been trained and are providing services to K-12 school districts and postsecondary educational institutions across the country, as well as at local and national conferences. The growth and demand that was part of NETAC's collaboration continues today, even as technological advancements have resulted in the training becoming available entirely online.

NETAC products – Each year the number and kind of NETAC products created for national distribution continues to grow. These include packaged training and workshop materials on such topics as transition, access and accommodations, and an online program for financing a college education, to name a few. Most recently NETAC produced an award-winning video series and accompanying Web site, "Achieving Goals!," which showcases the many and varied careers of deaf and hard-of-hearing people in medicine and healthcare, business management, not-for-profit organizations, and various trades.

The **NETAC Tipsheets** have been enthusiastically received by audiences regionally and nationally. These Tipsheets—handy, one-page documents written on a variety of topics derived in part from feedback obtained as a result of a widely distributed **Needs Assessment**—represent yet another indicator of NETAC's ability to collaborate with professionals on a national basis. The Tipsheets are authored by individuals from around the country with proven expertise in each topical area. Widely used, the Tipsheets are available through the PEPnet Resource Center and also by download from the NETAC Web site.

As mentioned earlier, these are just a few of the accomplishments and milestones NETAC has achieved since its inception in 1996. NETAC's regional and national collaboration continues to expand and includes participating partnerships with other grant-funded initiatives such as FIPSE demonstration projects and its ongoing collaborating partnership with the three other regional centers that comprise the Postsecondary Educational Programs Network (PEPNet).

And now that NETAC is approaching its ninth year, we should not consider these past accomplishments an end to themselves but rather a learning experience that has afforded us a window to the future. The challenges ahead are clear, and I invite our NETAC colleagues to join us as we look to the future to expand our outreach and training initiatives to traditionally underserved students, students from diverse ethnic backgrounds, parents, and prospective employers.

Best wishes for a productive 2004!

Dianne

NETAC Networks is produced at least three times a year.

Articles should be submitted electronically to
Sherlea Dony, editor, saddhd@rit.edu.

All articles are subject to editing.

Comments and suggestions are always welcome!

Upcoming events by state*

Maryland

Unless otherwise noted, contact Florence Cooney, NETAC/Maryland Site Coordinator, 410-455-4369 (v), 410-455-4553 (tty), Fcooney@ccbcmd.edu

- Friday, March 19, the Maryland State Steering Committee for Deaf and Hard of Hearing Students annual conference, "It's All About Access – Academic Achievement of Students Who are Deaf & Hard of Hearing," Decker College Center at McDaniel College, Westminster. For registration information, contact the Mid-Shore Special Education Consortium, 410-763-6823.
- Thursday, May 20, "Challenges and Strategies for Working with Students who are Deaf, Hard of Hearing, or Visually Impaired," presented to the Maryland Disability Higher Education Network at CCBC Catonsville.
- Friday, June 4, the Nation's Capitol Area Disability Support Services Coalition bi-annual conference, "Postsecondary Students with Disabilities: Creative Solutions to Present and Future Challenges," University of Baltimore, Baltimore.
- C-Print On-Line Training: NETAC/MD has funds to purchase software and cover registration fees through June 30, 2004 to support candidates for C-Print training who are affiliated with a postsecondary institution.

Massachusetts

For additional information on Massachusetts events, contact Jane Nunes, Massachusetts NETAC site coordinator, 978-556-3341 (v/tty), NETAC@necc.mass.edu

- Thursday, March 18, Accommodations Demo/Fair, College of the Holy Cross, Worcester. Demonstration and exhibition of a variety of accommodations provided to students who are deaf and hard of hearing, including C-print®, CART, sign interpreters, cued speech, ALDs, etc.
- Friday, March 19, "Adjustment to Hearing Loss: What it Means to your Student," Northern Essex Community College, presentation by Adjustment Counselor John Anderson from the Mainstream Center at the Clarke School for the Deaf. For more information, contact Barbara Rochon, 413-587-7313 (v/tty), brochon@clarkeschool.org
- Saturday, April 3, CareerFest 2004, a career exploration event for middle and high school students who are deaf or hard of hearing and their parents, counselors, and teachers. Co-sponsored with the Massachusetts Rehabilitation Commission, the Gallaudet University Regional Center, the Massachusetts Commission for the Deaf and Hard of Hearing, the Massachusetts Department of Education, and others. For more information contact Julie Proud Ray, Massachusetts Rehabilitation Commission, 617-471-1600 (v), 617-471-5059 (tty), or Julie.Proud-Ray@mrc.state.ma.us or the Massachusetts site for NETAC.
- Friday, May 21, AHEAD NE annual conference, Woburn, MA.

New Hampshire

- Saturday, March 27, the third biennial "Voyage to the Future" event at the NH Technical Institute in Concord, NH. The event will include workshops for parents and students, a career fair, a college fair, and a panel of college students, as well as evening cultural event for all members of NH's Deaf Community and other guests. For more information, contact Cate Weir, 603-228-2084 (v/tty), cweir@cisunix.unh.edu

New York

- March 26, 8:30 a.m.–6:00 p.m., Grant Writing Workshop, LaGuardia Community College, Queens. Gail Hyde, Senior Research Administrator at NTID, will lead this event. If you are interested in attending, contact Desiree Duda at nycnetac@optonline.net
- Friday, April 2, NYS NETAC Consortium meeting, Albany. The NYS NETAC Consortium will convene for its annual statewide meeting. Dianne Brooks, NETAC Director, will present and lead the group discussion; materials and products will be highlighted. For more information contact either Desiree Duda or Sherlea Dony.
- April 30-May 1, Educational Support Services Personnel Conference, Ithaca, "Panoply of Phantastic PEPNet Products and Paraphernalia Pertinent to Our Profession (a/k/a a Review of PEPNet Products That May be of Interest to You!)," presented by Sherlea Dony, NETAC Upstate New York coordinator, Pat Billies, NETAC project coordinator, and Regina Kiperman, NETAC project assistant. For more information contact Sherlea Dony, 585-475-7567 (v/tty) or saddhd@rit.edu

Vermont

- Saturday, May 1, Student/Parent Career and College Planning Conference for deaf and hard-of-hearing students and their parents to help them plan for life after graduation from high school. For more information contact Janet Dickinson, NETAC Vermont site coordinator, 802-258-9521 (v/tty), Janet_ed@yahoo.com

* Updated information will be posted on the NETAC Web site as it becomes available.

Apology for omission in November 2003 article, "Transition 'Camp' held at Capitol Area Intermediate Unit"

by Lori Hutchison

My sincere apologies go to Joe Caracci of the Western Pennsylvania School for the Deaf Outreach Office for not mentioning his role in the Transition Camp article in the last edition of *NETAC Networks*. Joe and the Western Pennsylvania School for the Deaf administration have been very involved with the important issue of transition, and they have taken a unique leadership role in working with the state Intermediate Units to assist them in any way possible. During this Transition Camp, Joe was the moderator of the Deaf employees panel and helped keep a lively discussion flowing. Again, my apologies, and thanks, Joe, for making it such a fun day!

Lori Hutchison is the NETAC Pennsylvania site coordinator.



Practice what you preach! “The ADA and Section 504 are all about case-by-case consideration.”

by Jane Jarrow

How often have you heard that said? How often have you said it to a faculty member or administrator to make a point about what needs to be done for/with a student with a disability? Now comes the hard question—how often do you practice it yourself when you look at your OWN policies and procedures???

Regularly, service providers working with their first-ever deaf student are dismayed to find that they need to provide two interpreters for the same student in some situations. The plaintive questions are asked at a meeting, or go out on a listserv, “When do we need to provide two interpreters? Is it really necessary?” Invariably, the response that comes back is some kind of formula or gauge to suggest that if a class or activity is more than ____ amount long, two interpreters will be necessary. The explanation is logical and appropriate and revolves around issues of physical stamina and cognitive attention. Concerns about repetitive motion injuries, carpal tunnel syndrome, and the like, suggest that holding your hands out in front of you and signing formally, precisely—and quickly!—for extended periods of time can be both daunting and painful. Moreover, the cognitive task involved in listening to the speaker, translating content into sign language, and translating thought into physical action can also be draining. The answer to the second question, then, is “Yes, it may really be necessary to have two interpreters working at the same time, spelling each other.” The first question, though, may have a less definitive response.

How do you determine how long a period of time can be covered by a single interpreter and when it is time to bring in a second? As I travel around the country, I hear different formulas suggested. For example: “If the class is more than two hours long, you need two interpreters.” “If the requirement is for platform interpreting (that is, before a large group in a formal setting, rather than sitting with a single student in a class), two interpreters should be present.” “Interpreters working in teams should have 20 minutes on, 20 minutes off.” What I have NOT heard anyone say (until very recently) is, “You need to evaluate the interpreting need on a case-by-case basis!” The experienced service provider who offered this response went on to provide some excellent examples. There may be some classes that are only an hour in length whose content is so complex or in which the interpreting demands are so significant that two interpreters need to team up in order to assure full access. On the other hand, there may be three-hour computer science labs in which the faculty member talks for 10 minutes, gives everyone 15 minutes to try out the new coding/technique, then talks for another 10 minutes before leaving all to experiment again while the instructor circulates around the room offering individual support. For that kind of presentation, you certainly don’t need two interpreters! This line of thinking triggered some consideration of individualized analysis of other service options. Experienced service providers who have deaf

students using CART services often note that the student wants the realtime captioning for language-based courses (from English to U.S. history) but still prefers a sign language interpreter in science and math classes. Why? Because scientific and mathematical notation doesn’t translate easily to the linear, text-based presentation available through CART. That appears to be a most logical case-by-case analysis, matching the service option with the circumstances. Often, less experienced service providers assume that the deaf student will want one or the other, CART or interpreting. If a deaf student chooses to use interpreters in some classes and is successful with them, then the service provider balks at providing CART for other classes, knowing that CART services often cost considerably more than interpreting services. The legal argument in their favor suggests that the institution is required to provide “effective access,” not the accommodation of choice, so why should they pay the higher fee? That argument ignores the fact that the different accommodation options do not necessarily provide the same level of effectiveness.

A recent listserv discussion began by acknowledging that the mandate for access and accommodation extends outside the classroom and that co-curricular activities (from participation on the varsity team to participation in Ski Club) are an important part of the college experience. Inevitably, the question came down to where and how you draw the line. The specific example that always comes up (because it is the one with the hefty price tag!) is whether there need to be interpreters provided at everything from a student government presentation by the League of Women Voters to the Friday night kegger at the local fraternity. Some folks responded by trying to distinguish between institutionally sponsored activities and those that were strictly student generated. Others looked at whether the outside groups were institutionally SANCTIONED. Then someone quoted an OCR officer who once told him, in effect, that the closer the activity was to the central mission of the University, the greater the likelihood that he would need to provide accommodations. The general response was, “Oh, but that would be an invitation to disaster. Who is going to make those decisions? It would be better to always provide the interpreter.”

What about the possibility of considering whether providing the interpreter seems to be a necessary and programmatically sound response to the specific circumstances involved, and then not being afraid to use your judgment and make some decisions?!? Case-by-case — what a novel idea!

Jane Jarrow, Ph.D., is president of Disability Access Information and Support (DAIS). An expert in disability services, she has been providing technical assistance and training to service providers on access and support services for persons with disabilities in higher education and has co-authored or authored numerous books and articles in the field of disabilities in higher education over the past 20 years.

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Accommodating college students with cochlear implants

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cochlear implant into meaningful speech. Postlingually deafened college students with cochlear implants are expected to continue to function as primarily auditory learners. These students report significant benefits in speech comprehension and telephone use.

What about college students who are prelingually deaf?

These individuals were born deaf or became deaf before developing spoken language. Their background is very different from postlingually deafened adults. At NTID these students report improvement in their ability to detect environmental sounds, their voice, and the speech of others. Speechreading is also easier. Some are able to follow a conversation with or without topic clues and are using cell phones.

Speech understanding without speechreading and speech intelligibility varies greatly. The rate of improvement can be very slow for the older child or prelingually deaf adult. To facilitate progress, it is important for students to keep their cochlear implant in good working condition and follow through with recommended mapping (fine tuning) of the implant by the cochlear implant audiologist. Consistent auditory input from surrounding environments, structured listening activities, and speech language therapy are also strongly recommended.

Given the diverse backgrounds of students with cochlear implants, what is the range of the accommodations that may be requested? It is important to provide a broad range of accommodations. The support services requested may be the same as those for other deaf and hard-of-hearing students. However, as students learn how to hear with the implant, their communication and support service preferences may change. Students may be divided into three groups of learners: visual learners, auditory-visual learners, and auditory learners. Support services requested by visual and auditory-visual learners include: sign language interpreting, oral interpreting, cued speech transliteration, C-print, captioning, notetakers, tutoring (in classrooms and group settings), and simultaneous communication (for face-to-face communication). Auditory-visual and auditory learners may also prefer to hear the teacher's voice and use assistive listening devices. Opportunities to listen in the classroom are invaluable for all students with cochlear implants. Auditory input can be provided by the teacher's voice, classmates, recorded lectures, CDs, computer programs, etc. Consistent auditory input facilitates the brain's processing ability for interpreting electrical codes produced by the implant. Increasing experience with the cochlear implant may move students along a continuum:

More visual → auditory-visual → more auditory.

How may noise in the classroom affect the student? With the cochlear implant, the classroom has become much noisier! Students experience an increased awareness of sounds. They are not only hearing the teacher and their classmates' voices, but chairs moving, writing on the board, computer drives, ventilation systems, etc. Awareness of the sounds does not always bring recognition. Noise also interferes with speech. For example, a student's name may be called when his back is turned. The brain has to listen to the sound provided by the implant, separate it from the other sounds being heard, and determine that it was the student's name. As mentioned earlier, the ability to adjust to these sounds and add meaning to them varies across users. Additionally, most cochlear implant users only have one implant. Therefore, it may appear that most sounds are from the implanted

side and may take longer to locate. It's also more difficult to hear in noise. Some cochlear implant models have external volume and microphone sensitivity controls for decreasing the effects of noise. Some students are still learning how to use those settings effectively. Use of classroom strategies with deaf and hard-of-hearing students that enhance the listening environment (e.g., carpeting, closing the door during instruction, minimizing noise in the classroom, facing the student, notetaking, etc.), will benefit cochlear implant recipients.

Can cochlear implant recipients use assistive listening devices (ALDs)? Yes! FM systems and soundfield speaker systems can be of great benefit in classrooms and large lecture halls for cochlear implant recipients. ALDs can facilitate learning and participation by reducing the effects of poor room acoustics and distance. The teacher's voice can be at a closer distance and louder than the background noise. They can also be coupled to audio and video equipment (e.g., tape recorders, computers, CD players, etc.). The cochlear implant may be coupled to an existing FM system via a built-in telecoil (T-switch) or FM cable. Some newer FM systems are specifically designed for use with cochlear implants. A second microphone may be needed for group discussions. Some students have also found success in using portable desktop speaker systems. Consult the student and a cochlear implant audiologist for the FM options and fitting. The audiologist can conduct an assessment using the ALD system to ensure that it is providing the anticipated benefit.

What does the future hold? As cochlear implant technology continues to improve, more students may become eligible for a cochlear implant. Therefore, an increase in the numbers of cochlear implant users on college campuses is expected. Communication preferences, quantity, and type of support services requested for those students implanted at age one will be different from those implanted at age 18. On the horizon are students with bilateral cochlear implants that aid with localization and hearing in noisy situations. Development is also on the way for fully implantable implants. It's critical to keep abreast of the possible impact of new technology in the classroom and be prepared to offer a range of support services. Improved communication between students with cochlear implants and their college will be a mutually beneficial and rewarding experience.

Catherine Clark is the coordinator for the Cochlear Implant Program in the Audiology Department at the National Technical Institute for the Deaf.

Registration deadline is March 29!

**The PEPNet 2004 Conference,
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“Starting Off on the Right Foot—College Planning Advice from Professionals and Deaf and Hard-of-Hearing Students” helps students put their best foot forward!

by Florence Cooney

On Wednesday, January 21, 2004, the Maryland School for the Deaf, Partners for Success, the Division of Rehabilitation Services, and NETAC/Maryland sponsored one of the newest NETAC programs, “Starting Off on the Right Foot.” This transition program was designed to provide teachers of the deaf, guidance counselors, and transition coordinators with comprehensive materials to share with students, as well as their parents, as they plan the transition from high school to college or work.

The event was held at the Maryland School for the Deaf—Frederick Campus—and was presented by Pamela Lloyd, Coordinator of Disability Services at RIT. Despite the rather frigid weather (for Maryland anyway!), the event was well attended by parents, students, teachers, and counselors. Pamela shared extremely valuable information on student responsibilities and documentation guidelines. Students attending the presentation were given ideas about how to prepare themselves as they begin to think about life after high school. Parents were given ideas on how to prepare their child, with emphasis on the changing role of the parent from the secondary to the postsecondary setting. Teachers and counselors were given points to help prepare their students for this upcoming transition. Pamela peppered the information with real-life stories relating to her experiences working with students



and parents, which really helped to illustrate her points.

In addition to Pamela’s presentation, a videotape was shown entitled, “Legal and Practical Issues” which was presented by Kathy S. Hoffman, Coordinator of Special Services at Erie Community College, Buffalo, New York, and Carolyn L. Boone, Coordinator, Disability Support Services at SUNY Fredonia, Fredonia, New York. The

information provided on the tape related to understanding what a reasonable accommodation is and how to get it, as well as understanding the legal and practical differences between secondary and postsecondary settings.

The final part of the program focused on VR. This segment was presented by Karen Love Hanes, Regional Counselor for the Division of Rehabilitation Services (DORS). She gave the audience information about the role of Vocational Rehabilitation from a Maryland perspective.

As you can see, a lot of information is packed into the “Starting off on the Right Foot” training package. The bottom line is to see students who are deaf and hard of hearing successfully complete their postsecondary degree programs and secure meaningful employment after graduation. It’s a step in the right direction!

Florence Cooney is the NETAC site coordinator for Maryland.

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This publication was developed under a grant from the U.S. Department of Education, Office of Special Education and Rehabilitative Services (OSERS) and produced through a cooperative agreement between RIT and OSERS (H324A010002-01). The contents herein do not necessarily represent the Department of Education’s policy nor endorsement by the Federal Government.