

NCRAR Newsletter

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SPECIAL POINTS OF INTEREST:

- Article by Frederick (Erick) Gallun et al "Auditory Dysfunction and Blast Trauma"
- NCRAR Biennial Conference - a huge success

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Message from the Director: Stephen Fausti Ph.D.

Funding received from DoD-VA Joint Incentive Fund (JIF)

I am very proud to announce that the NCRAR in conjunction with Madigan Army Medical center and Womack Army Medical Center have been awarded funding for a DoD-VA Joint Incentive Fund (JIF) Project titled "Hearing Loss Prevention Program". The goal of this initiative is to reduce the risk of noise-induced hearing loss (NIHL) for war fighters, other military personal and veterans. Of veterans with service-connected disabilities, one in seven is service-connected for NIHL or tinnitus. Therefore, the success of the JIF program can significantly reduce VA expenditures for auditory rehabilitation, as well as improve the quality of life for veterans by preventing hearing loss and tinnitus. The purpose of JIF monies are to encourage development of sharing initiatives at the facility, intra-regional and nationwide level. The program to be established will enable the NCRAR to address its clinical mission of benefiting veterans and others by alleviating the communicative, social and economic problems resulting from auditory system impairments.



As the National Center for Rehabilitative Auditory Research (NCRAR) begins its new funding period through 2012, this multidisciplinary team of investigators, educators and clinicians continues to be a leader in the field of finding solutions to auditory dysfunction. The Center has distinguished itself on the forefront of translational research, by translating basic science findings into clinical

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AUDITORY FUNCTION AND BLAST TRAUMA

Frederick Gallun, Ph.D., Marjorie Leek, Ph.D., & Stephen Fausti, Ph.D.

In 2005, the Brain Injury Association of America estimated that over 50% of combat injuries to soldiers serving in Iraq and Afghanistan are the result of exposure to explosive blasts. While many of the injuries are outwardly visible and life-threatening, one devastating effect of blast exposure can be damage to the brain. Here at the NCRAR, researchers are taking the lead in the investigation of the relationship between blast exposure and deficits in brain function related to auditory processing. Starting this fall, Drs. Leek, Fausti, and Lewis of the NCRAR will begin a collaboration with Dr. Therese Walden of the Walter Reed Medical Center in Washington, D.C. on a VA-funded project called "Central auditory processing disorders associated with blast exposure". They will compare the auditory abilities of 100 returning soldiers

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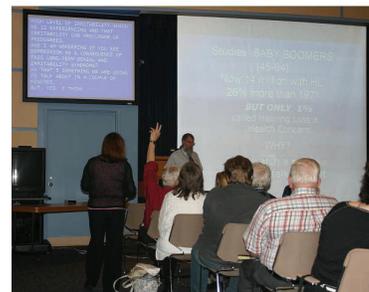
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NCRAR Community Lecture Series Report

Mitchel Turbin, Ph.D., Research Investigator at NCRAR and Adjunct Professor in Deafness Rehabilitation at Western Oregon University presented the second talk in the **NCRAR Community Lecture Series** on September 6th at 7 PM in the Portland VA Medical Center Auditorium. Dr. Turbin's presentation was titled "Living Well with Hearing Loss: Beyond Hearing Aids". The lecture focused on strategies for taking charge of life with hearing loss, including: coping with stress, change and loss; overcoming resistance to hearing aid use; encouraging effective speaker behavior; and communication rules for speakers and listeners. He included a number of video clips showing both effective and problematic communication behaviors.



Many members of the audience had hearing loss themselves, and their efforts to learn were supported by wireless microphones, real time captioning and FM assistive listening devices. Dr. Turbin encouraged active audience participation, and their observations, comments, suggestions and questions were interspersed throughout the presentation, greatly enlivening the event. Peter Steyger, Ph.D., associate professor in the Oregon Hearing Research Center at Oregon Health and Science University, attended the lecture and commented that the materials presented by Dr. Turbin were "immensely valuable and encouraging for the audience".

Message from the Director (continued from Page 1)

standards of care. Investigators are also pursuing high priority research and rehabilitation areas such as traumatic brain injury (TBI), which are critical to today's veteran. Additionally the NCRAR continues to fulfill its vision as an educational resource for both veterans and for the next generation of scientists and clinicians.

During my time in the VA healthcare system, I have seen dramatic changes in the need for veterans' hearing healthcare. Due to technological advances in protective gear and in medical treatment of our nation's warfighters, many more veterans are surviving military conflicts, yet are requiring more sophisticated rehabilitative care. A large percentage of these veterans have been exposed to traumatic blasts, leading to a significant increase in traumatic brain injury and associated peripheral and central auditory damage. The NCRAR has responded to several high priority research initiatives to investigate TBI to develop diagnostic tests and equipment, as well as rehabilitative techniques. By combining diverse research approaches such as audiology, neuroscience, psychology and engineering, we are uniquely positioned to pursue this important area of research.

I want to thank the Conference committee for organizing our Biennial International Conference and associated Pre-conference Workshop. This pair of highly successful events brought together an international group of acclaimed clinicians and scientists from the DoD, VA, industry, and the academic community to discuss new strategies for the diagnosis, treatment and prevention of auditory dysfunction.

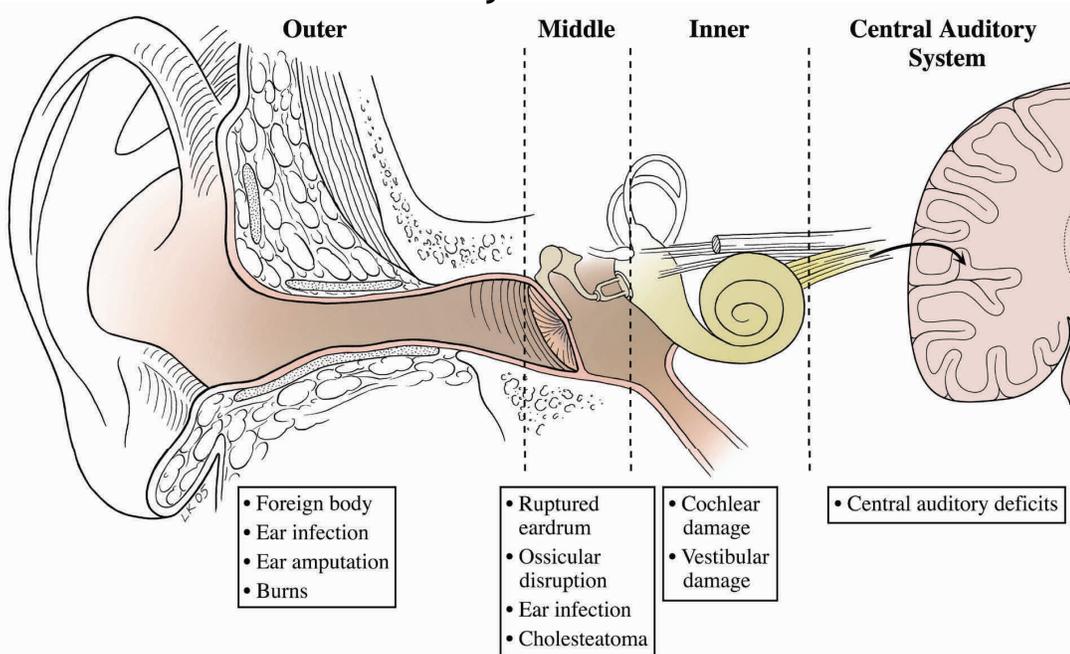
The continued success of the NCRAR's educational and research endeavors reinforces its role as a multidimensional center that remains an integral part of the future of auditory rehabilitation for both veterans and the general population. I am immensely proud of the NCRAR's accomplishments and look forward another successful five years.

AUDITORY FUNCTION AND BLAST TRAUMA (continued from Page 1)

who have been exposed to blasts to those of 100 control subjects who were not blast exposed.

The rationale behind this study is that because good auditory function depends on the integrity of the brain as well as the ear, it is almost certainly the case that some of those who have been blast exposed will have auditory damage related to their brain injury. The Figure shows the range of auditory dysfunction that can accompany blast trauma. It is well known that in addition to damaging the outer ear, the shock wave of the blast can impact the middle ear by rupturing the eardrum and damaging the small bones in the ear (the ossicles). The pressure of the blast can also cause permanent hearing loss by damaging the inner hair cells, which turn the sound energy into nerve impulses.

Potential auditory effects of blast trauma



ear, the shock wave of the blast can impact the middle ear by rupturing the eardrum and damaging the small bones in the ear (the ossicles). The pressure of the blast can also cause permanent hearing loss by damaging the inner hair cells, which turn the sound energy into nerve impulses.

The types of damage that potentially could occur in the central auditory system include stretching and shearing of nerves in the brainstem as well as impact and abrasions of the

cortical lobes. These stresses to the brain and the brainstem could result in loss of connections as well as reductions in the signal to noise ratio of communications traveling up and down the auditory pathways. Such damage could have profound implications for the sorts of auditory processing necessary for communication and navigation in complex environments. Sound localization, for example, depends on precise microsecond (1/1,000,000th of a second) timing comparisons of sounds arriving at the two ears. Similarly, human speech consists of multiple changes in intensity and frequency every second, and understanding spoken language depends on following all of those changes.

In the future, the NCRAR will begin researching the extent to which tests of central auditory processing can be used to screen for the presence of milder forms of traumatic brain injury. With so many of our returning veterans having been exposed to one or more blasts, it is crucial that we learn as much as we can about the auditory effects of blast exposure. In addition, by developing accurate and easily administered tests of central auditory function, it will become possible to identify even the milder forms of brain injury earlier and more precisely, which will allow appropriate treatments and therapies to begin when they can be most effective.



Erick Gallun, Ph.D. is a NCRAR Investigator and Asst. Professor, Dept. Otolaryngology at Oregon Health & Science University (OHSU).



Marjorie Leek, Ph.D. is NCRAR Deputy Director of Research, an NCRAR Investigator and Professor of Otolaryngology at the OHSU.



Stephen Fausti, Ph.D., is the ACOS and Director of the NCRAR at the Portland VA Medical Center, and Professor of Otolaryngology at the OHSU.

Illustration by Lynn Kitagawa, Portland VAMC

Upcoming NCRAR Events

Most NCRAR seminars are broadcast live via v-tel to other VA facilities. Contact Gabrielle.saunders@va.gov for information

November 7: NCRAR Seminar** **Beverley Wright Ph.D.** Associate Professor of Communication Sciences and Disorders and Director Hugh Knowles Center for Clinical and Basic Science in Hearing and its Disorders, Northwestern University, Evanston, Illinois. **Hearing lessons: Perceptual Learning on Basic Auditory Skills.**

December 7: NCRAR Seminar. **Brian Gygi Ph.D.** Associate Professor, University of Akron OH. **Effect of Auditory Context on the Identification of Environmental Sounds.**

January 11: NCRAR Seminar. **Robert Shannon Ph.D.** Scientist III and Head, Dept. of Auditory Implants and Perception, House Ear Institute CA. **Restoration of Hearing by Electric Stimulation of the Human Cochlea, Brainstem, and Midbrain.**

March 21 2008: NCRAR Seminar. **Douglas Keefe Ph.D.** Staff Scientist IV, Center for hearing Research, Boys Town national Research Hospital Omaha, NE. **Title: TBA**

April 11 2008: NCRAR Seminar. **Brenda Lonsbury-Martin Ph.D.** Research Professor, Division of Head and Neck Surgery, Loma Linda School of Medicine, Loma Linda, CA. **Title: TBA**

May 21 2008: NCRAR Seminar.

Kris English Ph.D. Scientist, Martinez VA, CA. **Audiology and Counseling or, Listening with the Third Ear.**

All Seminars take place from 12 to 1 pm in PVAMC Building 101 Room 109. for v-tel broadcast unless otherwise noted.

****This seminar will take place in the NCRAR Conference Room, Building 104, Room P5F-154**

NCRAR News

Welcome to:

- Research Audiologists **Keri O'Connell Au.D.** and **Marilyn Dille Ph.D.** who joined us over the summer and **Serena Dann Au.D.** who joined us this Fall. They are working with Drs Fausti, Leek and Saunders on various ongoing research studies
- **Anna Diedesch**, who was a recipient of the NIH-funded Au.D. Summer Research Internship experience, is now conducting her 4th year externship at the NCRAR

- **Robert Folmer Ph.D.** who is the fulltime Coordinator for the JIF project
- **Linda Casiana**, part-time research assistant for Samantha Lewis
- **Martin Schechter** has joined the NCRAR as a consultant, mainly working with Jim Henry on his tinnitus treatment research

Welcome back:

- **Kelly Reavis** who is working part-time at the NCRAR as a Research Audiologist while she completes her MPH degree

Goodbye to:

- Linda Munoz who is going to pursue new interests working as a Research Assistant/Coordinator in phase 1 & 2 clinical trials at a private Rheumatology practice in Lake Oswego

Thank you to:

- Christopher Stecker Ph.D., Terry Chisolm Ph.D., and Arthur Boothroyd Ph.D. for their recent presentations at the NCRAR as part of our Seminar Series

NCRAR conference “Hearing Therapies for the Future” a huge success

One hundred sixty five individuals from 30 states, the UK, New Zealand and Germany attended the NCRAR conference titled “Hearing Therapies for the Future” that took place in Portland, OR on September 27 & 28th. On September 26th, seventy five people also attended a one-day pre-conference workshop run by Drs. Theresa Schultz, Col. David Chandler and Kyle Dennis titled "Best Practices in Hearing Loss Prevention."

These two complementary meetings tackled the pertinent subject of noise-induced hearing loss (NIHL) and traumatic brain injury (TBI) from both research and clinical perspectives. In keeping with the NCRAR’s mission to promote translational research, Dawn Konrad-Martin (Program Committee Chair) and her Program Committee (Drs. Jim Jerger, Brenda Lonsbury-Martin, and Al Ryan), put together the highly interesting program while, Gabrielle Saunders, Conference Chair, Christine Kaelin and Carolyn Landsverk organized the conference logistics.

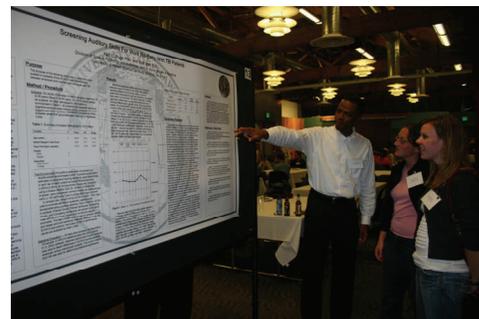
The conference began with an Opening Reception on Wednesday evening at which Peter Steyger Ph.D., and Col. David Chandler Ph.D., Deputy Chief Consultant for Rehabilitation Services for the VA gave keynote addresses, entitled “Boys, Toys and Noise” and “Auditory Research Needs

from the Perspective of VA and DoD”. These informative and entertaining keynote addresses set the tone for the rest of the meeting – focusing on how damage to the auditory system from noise and toxic drugs impacts the human experience, with discussion of how such damage is compounded by traumatic brain injury, and what should be done to minimize damage in the future.



Conference organizers Christine Kaelin, Carolyn Landsverk, Dawn Konrad Martin and Gabrielle Saunders with NCRAR Director Stephen Fausti

The conference took place over the next two days during which scientists, researchers, and clinicians shared their expertise and viewpoints. The meeting benefited in particular from the mix of military, VA, academic and clinical personnel. Topics ranged from basic science ‘bench research’ such as two fascinating talks on hair cell regeneration and one on models of tinnitus, to applied findings such as new developments in hearing protection, and the functional impacts and diagnosis of TBI in patients with polytrauma. Even those attendees who were initially unfamiliar with some of the presentation topics found the research thought-provoking and were able to apply new insights to their practice. The poster session, accompanied by pizza, gave attendees an additional opportunity to socialize



Ken Pugh discussing his poster with Student Scholarship winners Anna Dienesch and Kelly Watts

with their colleagues more informally, while continuing to learn more about NIHL/TBI issues. Posters were presented by scholarship winners, as well as other invited presenters.



A roundtable discussion panel

Such a comprehensive program would not have been possible without the support of our generous sponsors (Interton, NIDCD, Phonak, Siemens, Starkey, and VA RR&D), so we would like to again acknowledge the generous sponsorship of these organizations.

This was the third NCRAR biennial conference, and in the words of one attendee, “They [these conferences] just keep getting better and better!”

The conference sessions will be broadcast by VA Employee Education System via V-tel in the coming year. Schedule information will be available at www.ncrar.research.va.gov and in upcoming issues of this newsletter.



Conference participants enjoying the outdoor terrace during the poster session

Meet Patrick (Pat) Helt, Deputy Director of Administration and Technical Support

I was born in Spokane, WA, and have lived in the Pacific Northwest my entire life. My father is a retired elementary school Principal and my mother is a retired high school English teacher. I have a brother who is four years younger than I, and a sister who is eight years younger. My brother and his family live in Lynden, WA, where my parents reside, while my sister and her family live in Pottstown, PA. After graduating from Lynden High School I attended the University of Washington in Seattle, WA, which is where I met my spouse of 18 years. We both transferred to Western Washington University in Bellingham, WA, where I obtained my Bachelors degree in Audiology & Speech Pathology in 1991, and my Masters degree in Speech-Language Pathology in 1994. We moved to the Portland metropolitan area in 1992 where my wife completed her audiology internship and clinical fellowship year under the supervision of Dr. Fausti in the Audiology Clinic at the Portland VAMC, and I completed my speech pathology internship and clinical fellowship year while working for a national contract services rehabilitation company. I spent the next five years working in a variety of skilled nursing and hospital-based rehabilitation units in the Portland metropolitan area.

In August of 1998, nearly one year after Dr. Fausti first obtained funding to develop the NCRAR, I made the jump from working as a Speech-Language Pathologist to working for the NCRAR as the Administrative Officer. My background in Audiology & Speech-Language Pathology and

prior experiences functioning as an integral member of multidisciplinary rehabilitation teams proved to be valuable assets for my position with the NCRAR. During the past nine years I have been fortunate to receive leadership mentoring within the NCRAR while serving others and witnessing the extraordinary evolution of the Center from a juvenile RR&D Center of Excellence lacking a specific and visible identity, to a one-of-a-kind national flagship Center of prominence for the VA and the RR&D Service. Of course the journey hasn't been without a few bumps in the road including challenges associated with building capacity of a unique start-up program, particularly within a large government agency where procedures and systems change frequently and human nature doesn't readily welcome change. I suppose that is one of the primary reasons I have been able to take pride in the job I've done for the NCRAR during this period—seeing how the Center has come together, flourished, and exceeded everyone's expectations.

Within the last year, the NCRAR's National Advisory Board agreed with the NCRAR leadership in that the Center's tremendous growth and development warranted a change in organizational structure and function, and concurred with the creation of three Deputy Director positions subordinate to the Director. My Administrative Officer position became the Deputy Director of Administration and Technical Support for the NCRAR, although my duties and responsibilities associated with the direction and management of administrative, engineering and biostatistical support service personnel within the Center



remained largely unchanged. My job is rewarding but also challenging in terms of achieving a delicate balance of anticipating and meeting peoples' needs in a timely manner while working within a highly structured organization and workplace where there are competing demands for limited resources.

Outside of work I enjoy spending time with my wife and children, Krista age 11 and Colin age 7, and with our extended families and good friends, particularly during summer vacations at our family cabin on a small lake in northeastern Washington State. Krista and Colin swim year round for the Tornadoes Swim Team, so we spend plenty of time at poolside watching the kids practice and compete in swimming activities. Krista has also played softball while I assisted with coaching several of her teams, and volleyball. Colin and I love to get out and play golf together (actually, he gets his biggest kick out of driving the golf cart)! Colin also enjoys playing baseball and football—a chip off the ole' block if I don't say so myself! I also enjoy jogging with our dog "Red", and working outdoors including creating outdoor living features when I can find the time.

NCRAR Presentations & Publications 7/07 - 9/07

PUBLICATIONS:

Durlach, NI and Gallun, FJ (2007) Theory construction in auditory perception: Need for development of teaching materials. Journal of the Acoustical Society of America, 112(2), 1014-1016

Gallun, FJ., Mason, CR. and Kidd, G., Jr. (2007) Task-dependent costs in processing two simultaneous auditory stimuli. Perception and Psychophysics, 69 (5), 757-771

Saunders, GH & Echt KV. (in Press) An Overview of Dual Sensory Impairment in Older Adults: Perspectives for Rehabilitation. Trends in Amplification

SUBMITTED MANUSCRIPTS:

Gallun, FJ, Mason, CR and Kidd, G, Jr. The ability to listen with independent ears. Journal of the Acoustical Society of America, conditionally accepted

Leek MR, Molis MR, Kubli LR, and Tufts JB. Enjoyment of Music by Elderly Hearing-Impaired Listeners. Submitted to Journal of the American Academy of Audiology

Lauer A, Dooling R, Leek M, and Poling K. Detection and discrimination of simple and complex sounds by hearing-impaired Belgian Waterslager Canaries. Revision submitted to Journal of the Acoustical Society of America

Lewis, MS, Wilmington, D., Hutter, M., Lilly, D., Bourdette, D., & Fausti, S. (2007). Auditory Function in Individuals with Multiple Sclerosis. Submitted to MS Focus

Souza, P and Gallun, FJ. Exploring

the role of the modulation spectrum in phoneme recognition. Submitted to Ear and Hearing

Steiner E, Austin DF, Prouser NC. Detection and Description of Small Breast Masses by Residents Trained Using Standardized Clinical Breast Exam Curriculum. Revision submitted to: Journal of General Internal Medicine

Watanabe KH, Djordjevic MV, Stellman SD, Toccalino PL, Austin DF, Pankow JF. A Comparison of Lifetime Lung Cancer Risks Computed for Benzo[a]pyrene and Two Tobacco-specific N-nitrosamines in Mainstream Cigarette Smoke with Risks Derived from Epidemiologic Data. Submitted to Cancer Epidemiology, Biomarkers and Prevention

PRESENTATIONS:

Fausti SA. Hearing Impairment Among Soldiers. Presentation given at the Rehabilitation of the Combat Amputee Consensus Conference, Center for the Intrepid, Brooke Army Medical Center, San Antonio, Texas, September 17-19, 2007

Gallun, FJ. On the Limits of Selective and Divided Auditory Attention. Cognitive Science Association for Interdisciplinary Learning (CSAIL), Hood River, OR, August 2-6

Gallun, FJ. Current Directions in Research at the NCRAR. Auditory Research Working Group, Groton, CT, August 23-24

Henry JA. Treating Tinnitus: What do Audiologists Need to Know? Invited presentation at Washington Society of Audiology Fall Meeting, Tukwila, WA,

September 28, 2007

Henry JA, Zaugg TL, Schechter MA. Managing Your Tinnitus: What to Do and How to Do it? (Part 1)NCRAR Tinnitus Education Group, VAMC, Portland OR July 17, 2007

Henry JA, Zaugg TL, Schechter MA Managing Your Tinnitus: What to Do and How to Do it? (Part 2)NCRAR Tinnitus Education Group, VAMC, Portland, OR, July 31, 2007

Lew HL, Guillory SB, Jerger J, Henry JA. Tinnitus and Hearing Loss in Traumatic Brain Injury and Blast Related Injury. Poster presented at the Biennial NCRAR International Conference: Hearing Therapies for the Future. Portland, Oregon, September 27, 2007

Saunders GH. Auditory Rehabilitation: State of the Art Hearing Aids and Other Factors. Guest speaker at OHSU Otolaryngology Grand Rounds July 30, 2007

Turbin, MB. Living Well with Hearing Loss Workshop. National Center for Rehabilitative Auditory Research July 12 & Sept. 6th 2007

Turbin M, English K, Abrams H. Patient-Centered Audiology: Communication Skills for Communication Sciences Professionals. Poster presented at the Biennial NCRAR International Conference: Hearing Therapies for the Future. Portland, Oregon, September 27, 2007

Zaugg, T. Update on Research at the NCRAR. Veterans of Foreign Wars Conference, Kansas City, MO, August 21, 2007

Tinnitus education group for veterans

*“The NCRAR conducts research, trains new scientists, and disseminates information to clinicians who assess and treat veterans with hearing disabilities. In addition, staff at the Center work to educate and inform the public about hearing conservation, hearing loss prevention, auditory rehabilitative strategies, and **tinnitus coping mechanisms**.”*

It is in support of this last goal (tinnitus coping mechanisms) that the tinnitus education group for veterans was created. The American Tinnitus Association (ATA) estimates that approximately 40-50 million American adults experience tinnitus as a chronic condition. Of those, 10-12 million seek some form of medical help, and 2.5 million are “debilitated” by tinnitus. Of the 24.7 million U.S. military veterans, it is estimated that 3-4 million of them have tinnitus. Tinnitus is a particular concern for veterans because so many of them experienced noise exposure while in the military.

Currently, tinnitus cannot be cured, but it can be *managed**. We believe that “knowledge is power,” and by providing tinnitus sufferers with education about tinnitus, we can help them manage their tinnitus and control their reaction to it.

Since 1999, Dr. Jim Henry and Dr. Martin Schechter have moderated regular tinnitus-education group meetings for veterans, often with subject matter experts from the local community. These meetings are held every 2-3 months, always on the first Tuesday of the month. The meetings are held in the NCRAR conference room, from 5:30-7:00pm. Past topics have included Acupuncture for Tinnitus, Tinnitus Retraining Therapy, Hypnosis for Tinnitus, Current Tinnitus Research, Use of specialized devices to relieve Tinnitus, Cognitive-Behavioral Therapy, Service Connection for Tinnitus, and Hearing Loss vs. Tinnitus. The meeting format alternates (depending on the topic) between Q&A, lecture, and hands-on (for example, to demo various sounds or devices for tinnitus management, etc.). These meetings are informal, and are a good opportunity for those with tinnitus to interact with researchers and find out about innovations in the management of tinnitus. There is no charge for these meetings, which are co-sponsored by NCRAR and the PVAMC Audiology Clinic.

In addition to veterans, the meeting is also open to anybody from the local community, and the local ATA group frequently includes information about upcoming meetings on their website and/or mailings.

For more information, or to be put on the mailing list for notification of future events, contact Kimberley.owens@va.gov

Note that we do not use the word “treatment,” which might imply that a “course of treatment” will quiet tinnitus. Instead, we use the word “management,” which more correctly reflects the need for **ongoing management of tinnitus.*

NCRAR research and other programs funded between 7/07 & 9/07

- **Peter Jacobs** is an Investigator on the newly funded grant *Noninvasive Blood Glucose Monitoring Using Otoacoustic Emissions* working with PI Eric Wan of OGI School of Science and Engineering at **OHSU**
- **Marjorie Leek Ph.D.** received NIH funding for *Hearing Loss and the Perception of Complex Sounds*
- **Marjorie Leek** is PI on the newly funded VA RR&D grant titled *Central Auditory Processing Disorders Associated with Blast Exposure*
- **Debra Wilmington and Stephen Fausti** are Co-PIs on the VA RR&D grant *Prevention of Cisplatin through Alpha Lipoic Acid*
- **Dennis Bourdette and Stephen Fausti** received VA RR&D funding for a grant titled *Effects of Training on Central Auditory Function in Multiple sclerosis*.
- **James Henry** received funding for a VA RR&D grant titled *Development of an Automated Test to Assess the Presence of Tinnitus*.
- **Marjorie Leek and Stephen Fausti** of the NCRAR, in conjunction with Madigan Army Medical Center and Womack Army Medical Center have been awarded funding for a DoD-VA Joint Incentive Fund (JIF) Project titled *Hearing Loss Prevention Program*.