

## Clinical Relevance for the Veteran

### **Social integration and life and family satisfaction in survivors of injury at 5 years postinjury**

Steven G. LoBello, PhD; Andrea T. Underhil, MS;  
Pamela V. Valentine, PhD; Thomas P. Stroud, MPH;  
Alfred A. Bartolucci, PhD; Phillip R. Fine, PhD, MSPH

**Purpose of the Work.** This research project assessed the relationship of social integration (SI) to life satisfaction and family satisfaction for individuals with traumatic brain injury, spinal cord injury, severe burn, and intra-articular fracture 5 years postinjury. **Subjects and Procedure.** Thirty-four matched pairs of injured patients were interviewed by telephone 60 months after initial discharge from the acute-care setting. **Results.** A significant difference was found between the high and low SI groups on the life and the family satisfaction measures. Those in the high SI group reported a greater degree of life and family satisfaction. **Relevance to the Veteran Population.** This research deals with a patient population that has much in common with the U.S. service veteran. First, most of the participants were young men who are similar in many ways to the younger military veteran who was retired from service because of serious injury. The veteran who is retired as a result of catastrophic injury has many adjustments to make, including the effects of the injury itself as well as the rapid transition from military to civilian life. The service member must come to terms with the effects of the injury without the daily support of the friends and support network that exist in the military. Recovery and readjustment often occur away from the context of the service member's life before the injury. For these reasons, any research into factors that affect social integration and family satisfaction would be relevant to the veteran population.

*Steven G. LoBello, PhD*

### **Development of a functional assessment measure for manual wheelchair users**

Rhonda K. Stanley, PhD, PT;  
Deborah J. Stafford, MPT, PT; Elizabeth Rasch, MS, PT;  
Mary M. Rodgers, PhD, PT

**Purpose of the Work.** This study investigated the development of a functional assessment tool for persons who use manual wheelchairs for locomotion. **Subjects and Procedures.** A panel of 6 rehabilitation experts and 30 manual wheelchair users (MWCUs) participated in content

development of the tool. We tested 5 MWCUs twice to determine reliability and 101 MWCUs once to determine internal consistency. **Results.** A 13-item test was developed. Reliability, content validity, and internal consistency proved to be good. **Relevance to the Veteran Population.** This is the first tool that assesses independence in both home and community mobility for persons using manual wheelchairs. The development of this tool is especially important for veterans because of the significant numbers of veterans who already use manual wheelchairs and the aging of the veteran population, such that the number of veterans who use manual wheelchairs is increasing. This tool may help rehabilitation specialists determine treatment goals for veterans who use manual wheelchairs, as well as their readiness and needs for home and community living.

*Rhonda K. Stanley, PhD, PT*

### **Appropriate protection for wheelchair riders on public transit buses**

Greg Shaw, PhD; Timothy Gillispie, BA

**Purpose of the Work.** In our opinion, most wheelchair tie-downs and seat belts on city buses, while capable of providing adequate protection in a rather severe crash if correctly attached, are difficult and time-consuming to use. This study tried to find information regarding how frequently a large city bus is involved in a severe crash. **Procedures.** We tried to find and review all important scientific papers and reports written on wheelchair transportation and bus safety. **Results.** The primary findings of this study include (1) very little information has been published regarding bus safety and crashes; (2) most reported wheelchair incidents involved noncollision events, such as abrupt braking, in which improperly used wheelchair tie-downs or rider seat belts resulted in minor injuries; and (3) studies spanning 30 years indicate that the large city bus is an exceedingly safe form of transportation. **Relevance to the Veteran Population.** Wheelchair riders do not face undue risk of injury in a large city bus. If further study confirms that severe bus crashes are very rare, this may mean that wheelchair riders may be adequately safe with less cumbersome ways to secure their wheelchair and themselves.

*Greg Shaw, PhD*

**A word-recognition task in multitalker babble  
using a descending presentation mode  
from 24 dB to 0 dB signal to babble**

Richard H. Wilson, PhD; Harvey B. Abrams, PhD;  
Amanda L. Pillion, MEd

**Purpose of the Work.** A speech-in-multitalker-babble test instrument was developed for use in a VA multicenter study examining the effects of hearing loss on self-perceived quality of life. This study provided the normative data for the test instrument and preliminary data on listeners with sensorineural hearing loss. **Subjects and Procedures.** Word recognition in quiet and in multitalker babble was measured on 24 listeners with normal hearing and 24 listeners with sensorineural hearing loss (HL). The protocol involved the presentation of 10 monosyllabic words (each in a unique babble segment) at each of seven signal-to-babble (S/B) ratios from 24 dB to 0 dB with the babble fixed at 60 dB HL. The data were interpreted with respect to the S/B ratio at which the 50% correct recognition performance occurred for each subject. **Results.** Word recognition in quiet at 60 dB and 80 dB HL for both groups was >90% correct. In the babble condition, no difference was found between the two trials on the task indicating excellent test-retest reliability. In babble, the 50% correct points were at 4.1 dB and 9.4 dB S/B for the listeners with normal hearing and hearing loss, respectively, and with the 90th percentile for the listeners with normal hearing at 6 dB S/B. Twenty-two of the twenty-four listeners with hearing loss had 50% correct points outside of the 90th percentile for listeners with normal hearing. **Relevance to the Veteran Population.** Service connection for impaired hearing is the most prevalent service connection disability in the veteran population. That fact coupled with the rapidly increasing number of other veterans seeking hearing healthcare from the VA emphasizes the involvement of audiologists providing services to veterans, especially with regard to hearing aids. The most common complaint that veterans with hearing loss have about their hearing is that they cannot understand speech in a background of noise. A test instrument like the one described in this paper will be most useful in evaluating the complaint of the veteran not being able to understand speech in background noise. With information about the word-recognition performance of the veteran in a background noise, the audiologist can optimize the aural rehabilitation strategy concerning counseling and amplification.

*Richard H. Wilson, PhD*

**Learning effects associated with repeated  
word-recognition measures using sentence materials**

Richard H. Wilson, PhD; Theodore S. Bell, PhD;  
John A. Koslowski, MS

**Purpose of the Work.** A set of sentence materials (VA Sentence Test—VAST) was developed with the use of principles of the Neighborhood Activation Model (word-usage frequency and word confusability). Each sentence had three target words that were used as the measure in an adaptive threshold technique. This study examined the learning effects of repeated presentation of sentence materials in an adaptive paradigm. Two questions were examined. First, did performance change with repeated exposure to the test materials? Second, if performance improved, then was the improvement owing to learning the test materials, learning the listening-response paradigm, or both? **Subjects and Procedures.** Ten listeners in each of three age groups (<30 years, 40 to 60 years, and >65 years) with varying degrees of hearing sensitivity were studied. Each listener participated in five test sessions over 5 to 10 days. Control lists, which served as practice on the listening-response task, were administered in each of the five sessions with the experimental lists administered only during Sessions 1 and 5. The materials were presented in a quiet background. **Results.** Thresholds were obtained for the control lists in Sessions 1 to 5 and for the experimental lists in Sessions 1 and 5. The experimental lists were withdrawn in Sessions 2 to 4. The mean thresholds (1) for the three subject groups were significantly different, (2) for the experimental conditions and the control conditions were not significantly different, and (3) in Session 5 were significantly lower than in Session 1. The changes in thresholds between Sessions 1 and 5 were essentially the same for each group of listeners. The implication is that improved thresholds were the result of the subjects learning the test procedure (including the listening-response task, speaker familiarity, and test environment) and not from learning the test words and/or sentences. It is noteworthy that although performance improved across the five sessions, repeated trials within a session provided stable results. **Relevance to the Veteran Population.** Service connection for impaired hearing is the most prevalent service-connection disability in the veteran population. That fact coupled with the rapidly increasing number of other veterans seeking hearing healthcare from the VA emphasizes the involvement of audiologists providing services to veterans, especially with regard to hearing aids. If sentence materials are to be used in the clinical

setting to evaluate word-recognition performance of veterans, then the data from the current study indicate that performance does improve with repeated exposure to the test paradigm across several days of exposure, but within a given test session, performance is very stable. Finally, the improvement in performance across test sessions is not appreciably affected by age and degree of hearing loss.

*Richard H. Wilson, PhD*

### **Lower-limb extensor power and lifting characteristics in disabled elders**

Teresa M. Danciewicz, MS, PT, MMHS, MPT;  
David E. Krebs, PhD, PT; Chris A. McGibbon, PhD

**Purpose of the Work.** Does resistance training facilitate function by improving coordination and muscular recruitment in common lifting tasks? **Subjects.** Subjects were included if they reported a limitation in at least one of nine Short-Form Health Survey (SF-36) physical function items, excluding the vigorous activity item. Eighty-nine functionally limited elders (60.3 to 89.8 years old) participated in an intervention consisting of either no-treatment control or a 6-month in-home video-facilitated elastic-band resistance exercise program. **Procedures.** Biomechanical variables, timed outcomes, and leg extensor strength were analyzed. **Results.** The intervention group improved knee extension strength by 17% and hip extension by 21% and improved coordination and timing between peak knee and hip extension powers during lifting. Total leg extension power, total leg extension strength, total work, and lift time were correlated. **Relevance to the Veteran Population.** Resistance-trained disabled elders demonstrated strength benefits and several trends consistent with improved coordination and more efficient lifting. More leg muscle power yields better functional lifting performance.

*Teresa M. Danciewicz, MS, PT, MMHS, MPT*  
*David E. Krebs, PhD, PT*

### **A novel cadaveric model for anterior-inferior shoulder dislocation: Using forcible apprehension positioning**

Patrick J. McMahon, MD; Stephen Chow, MD;  
Laura Sciaroni, MD; Bruce Y. Yang, BS;  
Thay Q Lee, PhD

**Purpose of the Work.** This study developed a novel cadaveric shoulder dislocation model that yields in vivo

pathology. **Subjects and Procedures.** Fresh cadaveric shoulders were used with a custom shoulder-testing device. Computer-controlled pneumatic cylinders with multiple pulleys were used to simulate the shoulder muscle forces during forcible apprehension positioning of the shoulder, causing anterior-inferior shoulder dislocation. The glenohumeral joint reaction force and the force in the pectoralis major muscle were quantified. **Results.** Forcible apprehension positioning using this shoulder dislocation model yielded capsulolabral avulsion resembling the Bankart lesion and yielded capsulolabral stretching similar to lesions observed in vivo. **Relevance to the Veteran Population.** Glenohumeral instability is a potentially treatable, causally related predisposing factor to degenerative joint disease of the shoulder and rotator cuff tear, which are highly prevalent in the Department of Veterans Affairs patient population. This study presents a human cadaveric model that simulates in vivo conditions and permits quantitative evaluation of surgical repair techniques that lead to improvements in treatment after anterior glenohumeral dislocation.

*Thay Q Lee, PhD*

### **Basic gait parameters: A comparison of reference data for normal subjects 20 to 29 years of age from Kuwait and Scandinavia**

Saud Al-Obaidi, PhD; James C. Wall, PhD;  
Alia Al-Yaqoub, BS; Muneera Al-Ghanim, BS, PT

**Purpose of the Work.** This study collected basic gait data on groups of healthy young adult Kuwaitis of both genders to determine how they compared to data published in an earlier study carried out in Sweden. These data would then allow a decision to be made on whether the Swedish database would be a suitable source of reference or whether the data were sufficiently different to warrant broadening the database to be more geographically and culturally inclusive. **Subjects and Procedures.** A sample of convenience was used that was composed of healthy Kuwaiti men and women between the ages of 20 and 29. The group was selected based on criteria developed for the Swedish study. Each subject was asked to walk at his or her slow, medium, and fast self-selected walking speeds over a special mat that measured the position and time of each footfall. **Results.** We found some differences in the patterns of walking of the Kuwaiti and Swedish subjects, suggesting that a need exists to further investigate differences between ethnically and geographically

disparate populations to establish more encompassing normative gait reference data. **Relevance to the Veteran Population.** Many conditions are seen frequently among the veteran population, such as lower-limb amputation, in which walking ability is assessed. The performance of the

patient is often compared to a healthy individual. This study suggests that a diverse sample of healthy individuals should be used to collect the data against that which patient values are compared.

*James C. Wall, PhD*