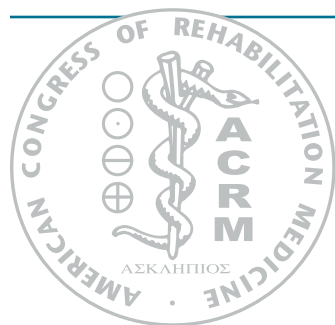


Rehabilitation OUTLOOK



Excellence in the science
of rehabilitation medicine
through interdisciplinary
collaboration

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Vol. 17, No. 4, 2012

Congratulations to the 2012 ACRM Award Winners

ACRM annually recognizes those who make significant contributions to the field of physical medicine and rehabilitation through cutting-edge research and the advancement of evidence-based practice in clinical settings.

Presentation of these prestigious awards will take place during the 2012 ACRM Annual Conference, *Progress in Rehabilitation Research*, 12 October, at the Henry B. Betts Awards Gala in Vancouver, BC. We are pleased to honor this year's winners as follows.

Rehabilitation OUTLOOK

Adam B. Warshowsky, PhD, Editor

Stephen Page, PhD, Chair
Communications Committee

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in August Issue of *ARCHIVES* 11



2012 Gold Key Award

The highest ACRM honor is awarded to **Marcel Dijkers, PhD, FACRM**. A prolific writer and past president, Dr. Dijkers is well-known for his quality research and extensive knowledge of rehabilitation literature.



John Stanley Coulter Lecturer Award

This year's prestigious lectureship recognizes **Susan Harkema, PhD** for her professional achievement and contributions to the advancement of the field of rehabilitation.



Mitchell Rosenthal Memorial Lecture

*"Reconceptualizing Brain Injury Rehabilitation
in the Future: A Peek over the Horizon"*

ACRM and Division 22 of the American
Psychological Association jointly sponsor this
annual lectureship honoring the late Mitchell
Rosenthal. Selected lectures are presented

at their respective organization meetings in alternate years. Mitchell Rosenthal Memorial Lectures are also published in the *Journal of Head Trauma Rehabilitation (JHTR)*. The ACRM-selected lecturers for 2012 are **Catherine A. Mateer, PhD** and **James F. Malec, PhD, ABPP-CN, RP, FACRM**



Deborah L. Wilkerson Early Career Award

This year, ACRM honors **Elizabeth R. Skidmore, PhD, OTR/L** for the contributions she is making to rehabilitation research during her early career work. She will present her research during the annual conference in a lecture titled, *Closing the Gap: Early Intervention for Cognitive Disability after Stroke*.

See **2012 ACRM AWARD WINNERS** continued on page 3

2012 ACRM-ASNR
Annual Conference

PROGRESS IN REHABILITATION RESEARCH

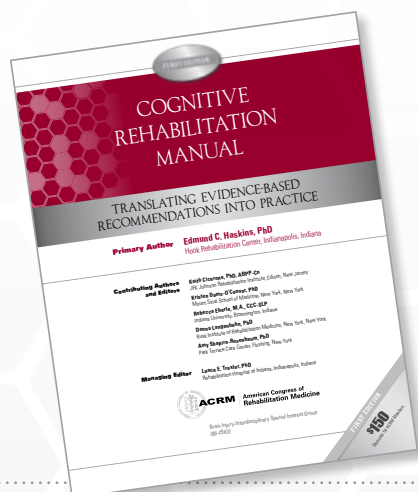


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Dr. Susan Harkema holds the Owsley B. Frazier Rehabilitation Chair in Neurological Surgery and is the Rehabilitation Research Director of the Kentucky Spinal Cord Injury Research Center at the University of Louisville. She is Director of Research at Frazier Rehab Institute and Director of the NeuroRecovery Network.

Interested readers will find more about Dr. Harkema's work with the NRN in the ACRM journal, Archives of Physical Medicine and Rehabilitation in September. Ten articles from the Christopher and Dana Reeve NeuroRecovery Network will be published in that special focus issue.

INTRODUCING THE 2012 John Stanley Coulter Award Lecturer, Susan Harkema, PhD and Her Pioneering Research in SCI

ACRM is proud to honor Susan Harkema, PhD with the John Stanley Coulter Award Lectureship in recognition of her pioneering research in spinal cord injury. Jenny Richard, ACRM Director of Member Services, spoke with Dr. Harkema recently to learn about her exciting translational research that is already improving lives.

JENNY RICHARD: Last month, the Rick Hansen Institute honored you and Dr. Robert Grossman with the Rick Hansen Difference Maker Award for your work in partnership with the Christopher and Dana Reeve Foundation. What can you tell us about that work?

DR. HARKEMA: Dr. Grossman was recognized for his work with the North American Clinical Trials Network and although I'm also a principal investigator with the Critical Trials, the aspect of my career that was highlighted by the award is the NeuroRecovery Network (NRN). Both programs are funded by the Christopher and Dana Reeve Foundation. This area of my research is what I consider the real translational component of my program. The NRN mission is to translate standardized, evidence-based rehabilitative interventions into the clinic. These interventions must also be activity-based, meaning they activate the neuromuscular system below the level of lesion.

There are seven rehabilitation centers across the country that are part of the NRN and each has specialized programs to provide the standardized care. The interventions are standardized across these seven centers and then an extensive program evaluation takes outcome measures every 20 sessions on the individuals receiving the intervention.

See **SUSAN HARKEMA** continued on page 4

2012 ACRM AWARD WINNERS continued on page 1



Distinguished Member Award

The Distinguished Member Award recognizes an ACRM member who has significantly contributed to the development and functioning of ACRM, demonstrating leadership skills, organizational abilities and public service. ACRM recognizes **Ronald Seel, PhD** for his extraordinary service to the organization, as a committee chair, task force chair, and BI-ISIG chair.

will be honored this year for a career that reflects an energetic promotion of the spirit of interdisciplinary rehabilitation.



Elizabeth and Sidney Licht Award

The Elizabeth and Sidney Licht Award recognizes excellence in scientific writing in rehabilitation medicine. Only articles published in the Archives



2012 Edward Lowman Award

The Edward Lowman Award acknowledges an ACRM member who recognizes the importance of multidisciplinary teams in rehabilitation. **Jeffrey Basford, MD**

of Physical Medicine and Rehabilitation which present potential significance and empirical and theoretical contributions to rehabilitation medicine, and soundness of methodology and data analysis are considered for the award. **Keith Cicerone, PhD** is honored this year for his article, Review of Evidence-Based Cognitive Rehabilitation, was found to meet this high standard. ■

JENNY RICHARD: Can you share some highlights of your current research at the Kentucky SCI Research Center and Frazier Rehabilitation Institute?

DR. HARKEMA: The heart of the program is doing hypothesis-driven basic science experiments in a human model. This originally started when I did my post-doc in Reggie Edgerton's lab asking the question whether the human spinal cord has complex interneural circuitry like had been discovered in every other species. It had originally been thought that this circuitry either didn't really exist or was not very functional in human beings because in our evolution we had developed a complex brain that has control over all our motor behaviors. The best model to ask this question was people who had, what was then considered, complete spinal cord injury.

The first 10 years of my career was designing experiments to understand whether the properties of what's termed "central pattern generation" existed in the human spinal cord. To test that, we put people in a harness and suspended them over the treadmill and then provided sensory cues to the spinal cord with the logic that if there was no detectable descending input from the brain, then any changes or output that we saw had to be mediated at the level of the spinal cord.

So, we did a whole series of experiments testing to see if we changed sensory cues, like load or rate of stepping so you had manual assistance provided to move the legs in a step-like pattern, we could modulate the body weight support to put more or less load on the legs.

We could change the treadmill speed to change the rate of information going back to the cord. If the cord was simply a conduit for commands from the brain, and then the brain processed all the sensory information and made the decision of how the motor behavior should happen, then we really shouldn't see any modulation when we did these experiments.

In fact, that is not the case. With all these experiments we could show modulation of the motor output in a way that was very consistent with the concept of central pattern generation and what had been shown in other animals. That was the first series of basic science experiments.

However, while we were doing these experiments, we started making other observations about the cardiovascular system, the respiratory system, the bowel and bladder function, circulation — all of these secondary conditions that are well-known for the spinal cord injury population, or really any population that is paralyzed. We started to see these benefits that had not been recognized before in the chronic population and that is what began the translational aspect of my program.

More recently, we have done experiments again based on animal models. Once we started identifying that there was this complexity in the spinal cord, we started doing repetitive training. Research in transected cats and other species had shown that if you transect an animal and retrain the spinal cord, you can get the animal to regain stepping or locomotion.

We also did a series of those experiments and training in people with clinically complete injuries. We could drive changes in the motor patterns, but no human being who had a complete injury could step independently over ground. However, when we did similar experiments in individuals with incomplete injuries there were many individuals, in our laboratory and other laboratories, who had been confined to a wheelchair for years and took steps and regained the ability to stand and walk after these experimental sessions of training. Although not completely back to normal, these individuals were able to generate steps and certainly this had a big impact on their lives.

We could modulate the spinal cord with training, but it was not resulting in independent walking. At the same time cat models starting changing into rat models and in the adult rat, unlike the cat, training alone did not recover hind-limb stepping.

However, when epidural stimulation and pharmacological agents were added, independent hind-limb stepping, like they had seen in the cat model, could be regained. We began to ask the question, "What if we used epidural stimulation strategies similar to those done in the rat, and in some very early studies in the cat, could we then facilitate this intrinsic capacity of the human spinal cord that we had seen evidenced in our other experiments?"

Our most recent studies have been to implant individuals who have a motor complete injury, either an ASIA classification as A or B, and then combine that with stand and step training. We want to see if we can better understand the human spinal cord circuitry and then also find ways that can drive that circuitry to functional motor behaviors, even in the case of severe injury that results in what seems like a complete loss of input from supraspinal centers.

JENNY RICHARD: It sounds like this research pertains to your pioneering work with Rob Summers, the paralyzed 25-year-old former Oregon State baseball player, and the restoration of his ability to stand. What can you tell us about that research?

DR. HARKEMA: The original experiment was to place the epidural stimulator and to start mapping the circuitry to see if we could understand more about the physiological properties of these interneurons and the motor behavior. We looked at whether we could

combine step training with this epidural stimulation and get better locomotor patterns.

However, the first time Rob was on the treadmill with a body weight support system and we provided stimulation, he was immediately able to stand independent of any physical assistance. This was really surprising to us. He only stood for a few minutes, but since this was something he could really benefit from, we were driven to focus on trying to stand train in combination with the stimulation and then do the stepping experiment. So that's what we did. We redesigned the experiment to some extent so we could do the stand training and we did see improvement.

Based on the dogma and our acceptance of that dogma, we thought the cortex had to be controlling voluntary activity, so by simply stimulating the spinal cord below the level of injury there would be no theoretical basis for the recovery of voluntary activity.

Well, we were doing a series of mapping experiments which are several hours long and quite boring for the research participant. During one of the stimulations, Rob tried to move his toe, which was really not part of the experiment, and he could move his toe. We were astounded. That drove us in another direction and we designed a whole new series of experiments to try to test the fidelity of this and what was really happening.

What we thought at the time, because we had extensively trained him, was that this had something to do with the training affect. This individual was an ASIA B, so we had sensory tracks available and maybe there was some plasticity occurring around the lesion or in the cortex and in the spinal cord that was strengthening these connections. However, this ability to move voluntarily only occurred in the presence of epidural stimulation. If we turned the stimulation off, we didn't get the response.

This really opens up a whole new series of questions about how even voluntary motor behavior is controlled in the human and that has opened up a new level of research for us. And we have subsequently implanted two more individuals and we are studying this quite extensively to try to understand what the underlying mechanism is.

In addition to that, he reported a lot of physiological changes and improvements in the secondary conditions associated with spinal cord injury, some which we had predicted might change and be measured, and some that we weren't measuring, things such as muscle mass changes, bone density changes, circulation, cardiovascular function. We had been measuring cardiovascular function, muscle and bone, but not circulation. He also reported improvements

in bowel and bladder, and sexual function, and we weren't measuring those. In these subsequent individuals we are starting to try to identify some quantitative outcome measures so that we can document these changes and understand what the underlying mechanism is.

I think what this has shown us is that there's a lot about the nervous system that we don't understand and that there's a huge capacity for plasticity in the human nervous system that can have a huge impact on multiple physiological systems. If you think about that now, retrospectively, maybe that's not so surprising. Our physiological systems are clearly integrated. When you have something as devastating as a spinal cord injury that renders you unable to move and puts you in a situation where you are not really opposing gravity, it makes sense that it would have a large impact on all your physiological systems, and certainly that shows up in secondary complications. It appears that if we can put individuals in a situation where they're activating their neuromuscular system and potentially also loading and opposing gravity again, there is a huge drive for all physiological systems. We don't know what that specific mechanism really is.

Is it just aggressively stimulating the nervous system? Is it the combination of loading and is opposing gravity a critical component? Is the training an essential component to this? Is there an overlap in integrated circuitry? When we say that a person with spinal cord injury is complete, are they really complete? Imaging techniques are not sensitive enough now to really look at individual tracks. So, although they can't voluntarily move or have sensation below the injury, are we underestimating the potential for these individuals? Are there, in fact, pathways that could be exploited and result in functional recovery?

There are so many questions now that need to be answered that would have an impact on many people, not only those with spinal cord injury. This population was selected because it was the best basic science model; however, we can apply our understanding to develop new therapies and rehabilitative strategies that should apply to all people with paralysis regardless of what the ideology of the paralysis is. We can take advantage of this spinal cord that really in other forms of paralysis has not been injured.

JENNY RICHARD: You have just been honored by ACRM as the 2012 John Stanley Coulter Lecturer. What can our annual conference attendees expect to learn from that lecture?

DR. HARKEMA: I plan to discuss a quick summary of those original experiments I mentioned earlier and what we know today from the epidural stimulation experiments.

See SUSAN HARKEMA continued on page 11

2012 MID-YEAR MEETING: BI-ISIG New Directions and Progress

By the BI-ISIG Executive Committee

For more than 25 years, the BI-ISIG has held a two-day Mid-Year Meeting to facilitate the work of our task forces and further fulfill our mission to improve rehabilitation practice through interdisciplinary research, education, and advocacy. We first wish to thank the 46 on-site participants and the dozen or more who participated via conference call in this year's ACRM BI-ISIG Mid-Year Meeting in Nashville. This year we initiated several changes aimed at improving membership participation and value.

- A task force chair / executive committee (EC) working lunch was held to improve communication and identify how task force efforts could be better supported. Primary initiatives emerging from this meeting included a quarterly conference call with the EC and chairs, earlier planning of BI-ISIG activities for the Mid-Year Meeting and Annual Meeting, task forces developing more program content for ACRM meetings, and task forces further facilitating the translation of research findings into practice.
- Successful implementation of the new early career scholarship (five awardees) and increased early career member participation in the Mid-Year Meeting. Initial feedback from first-time and early career attendees indicated that the task forces were well-organized and facilitated engagement.

- Conference call capability was available and used in most task force meetings.
- A two-day training seminar on delivering cognitive rehabilitation was added following the BI-ISIG Mid-Year Meeting to provide an opportunity to obtain CEUs. More than 110 persons registered and attended the training, and gave positive reviews of the event. Baseline, post-conference and one-month follow-up evaluations of attendees will assess the impact of training on their practice. Creation of a social media forum is being explored to facilitate attendees' exchange of ideas.



BI-ISIG Early Career Scholarship Award Winners

Zachary Bayer, Kristen Dams-O'Connor, Yelena Goldin-Lauretta, Angela Yi, Chari Hirshson (not pictured)

First ACRM Rehabilitation Summit Opens Dialog Among 20+ Rehab Organizations

At this year's Mid-Year Meeting, the ACRM sponsored the first Rehabilitation Summit to open dialog between rehabilitation organizations and develop a consensus position on rehabilitation topics affected by the Affordable Care Act. The Summit was very well attended by representatives from more than 20 organizations. Discussions revolved around a position on the essential benefits as relates to the Affordable Care Act, and a broader, evidence-based position statement regarding the value of rehabilitation irrespective of the current healthcare environment.

The ACRM assumed this task as part of its strategic plan to develop a consensus evidence-based position on rehabilitation.

Why ACRM?

Because it is the only rehabilitation organization that is *interdisciplinary*, and is therefore, not restricted to the interests of only one faction of the field of physical rehabilitation.

It is hoped that Summit participants will begin to develop consensus positions on these important issues, and that the group will continue to evolve, perhaps as a part of the newly created Health Policy Networking Group approved by the ACRM Board of Governors. This group will begin to look at even larger issues related to the field of rehabilitation. Watch for future opportunities to become involved in this new networking group. ■

MID-YEAR MEETING SYNOPSIS

All eight task forces met individually for two to five hours and convened as a singular group twice to discuss plans and progress. A brief synopsis:

BI-ISIG TASK FORCES	PRIMARY MYM ACTIVITIES
Cognitive Rehabilitation	Planning and training for fourth systematic review of cognitive rehabilitation for TBI and stroke published from 2009 – 2013.
Community-Based Treatment	Finalizing survey of community-based rehabilitation providers to identify current practice standards for brain injury, models of care used, and unmet patient needs.
Disorders of Consciousness	New initiatives – develop guidelines for DOC rehabilitation; advocacy; expand focus to post traumatic confusion and syndromes of impaired consciousness.
Girls and Women with TBI	Plan systematic review and advocacy on disparities in treatment, policy, research on women and girls (e.g., homelessness, domestic violence, sports, long-term care).
Long-term Issues	Project planning in coordination with the TBIMS Aging Special Interest Group; focus on Galveston recommendations for TBI management as a chronic disease.
Mild TBI	Project planning for systematic review on mild TBI; explore recent reviews and collaborations with other organizations.
Pediatric and Adolescent	2012 annual conference content includes a half-day pre-conference; plans to develop a full program of content for the 2013 annual meeting.
Prognosis after TBI	Recruitment plan for the IRB-approved survey of prognosis communication needs of patients and family members.
Technology	Exploratory group met to identify mission and potential goals.



Risa Richardson, Preston Harley, and Joseph Giacino

At the business meeting, the BI-ISIG 2012/13 budget for \$19,140 was approved by the membership (and had pre-approval from the ACRM Executive Finance Committee). This represents a 300% increase from last year with \$8,794 financed by BI-ISIG dues and \$10,346 provided through ACRM in-kind support. This investment in the BI-ISIG allows us to fund task force dissemination projects, Chautauqua speakers, website updates, *Moving Ahead*



upgrades, and the early career scholarships to attend the Mid-Year Meeting.

Attendees also seemed to find a little time for catching up with friends, good eats, attending the Grand Ole Opry, recording a congratulations video, and riding a mechanical bull. (Yes, we have pictures—please contact us if you wish to make a donation to the ACRM Charitable Fund in exchange for the negatives.)

We will be sending out a BI-ISIG membership survey to obtain more detailed feedback on this year's Mid-Year Meeting, further changes to *Moving Ahead*, use of social media to facilitate communications, and other ways we can improve your ACRM membership value. ■

The ACRM International Committee Reaches Out to ACSM

As the leading interdisciplinary rehabilitation association in the world, ACRM has a long history of collaboration with related organizations, institutions, and government agencies who share our mission to improve the lives of people with disabling conditions.

ACRM encourages and welcomes interdisciplinary exchange and cooperation across medical specialties, research fields, and special interest areas. In this spirit, Pouran Faghri, MD, recently represented the ACRM International Committee at the annual meeting of the American College of Sports Medicine, the *3rd World Congress on Exercise Is Medicine* in San Francisco, CA.

During a special reception welcoming international participants from 50 countries, he distributed promotional materials and information to introduce attendees to ACRM. The ACSM shares our goal of bringing cutting-edge research to life in everyday clinical practice and ACRM welcomes this opportunity to introduce you to them.

ABOUT ACSM

The American College of Sports Medicine (ACSM) is the largest sports medicine and exercise organization in the world. Their mission is to promote and integrate scientific research, education, and practical application related to exercise into everyday practice by health professionals. The membership includes a large, diverse group of scientists and health professionals from the US and around the world.

Noteworthy presentations during the 2012 annual conference of possible interest to ACRM members include sessions on how to address sedentary lifestyle in people with neurological disorders, current research in exercise and metabolic implications after spinal cord injury, from rehabilitation to wheelchair sporting excellence, exercise with neuromuscular limits, diet and exercise meeting the needs of the disabled athlete, and the role of exercise in rehabilitation of patients with burn injuries.

Additionally, a panel discussion regarding the challenges and controversies of sports-related concussion, chaired by Dr. Sanjay Gupta of CNN, included lively discussions about TBI in young athletes. The need to educate the public, parents and children, as well as changing policies and regulations for aggressive sports were addressed. ■

News from the Stroke Networking Group Cognition Task Force

The aim of the Stroke Networking Group Cognition Task Force is to explore the impact of cognitive function and cognitive impairments on functional outcomes following stroke.

A current project of the Cognition Task Force is a review of the existent literature covering dual-task interference after stroke, entitled *Examining Cognitive-Motor Interference during Functional Mobility after Stroke: State of the Science and Implications for Research and Clinical Practice*. This is a large-scope review of the literature, focusing on the interaction between cognitive and motor function during basic functional mobility tasks. The review offers a new perspective on the interpretation of dual-task interference paradigms, and provides a rubric for identifying and summarizing dual-task interference patterns.

In brief, different patterns may arise during dual-task conditions when compared to single-task performance. Cognitive performance may remain unchanged while motor performance declines, called “cognitive-related motor interference.” Conversely, motor performance may remain unchanged while cognitive performance declines, called “motor-related cognitive interference.” Or, both cognitive and motor performance may decline during dual-task conditions, called “mutual interference.”

The purpose of the review is to identify these patterns during mobility tasks such as gait, postural control and balance, and to discuss implications for current research and future clinical practice. This paper is in the final stages of preparation prior to external peer-review and publication. Be on the look-out for this exciting article in a peer-reviewed journal coming soon!

Learn more and get involved by contacting the chair of the Cognition Task Force, Elizabeth Skidmore, PhD, OTR/L at Skidmore@pitt.edu. ■

Mid-Year Meeting Update from the Spinal Cord Injury Special Interest Group (SCI-SIG)

Though smaller than the ACRM Mid-Year Meeting in Nashville, the SCI-SIG Mid-Year Meeting had a good turn-out and great energy. Thanks to the American Spinal Injury Association (ASIA), the SCI-SIG Mid-Year Meeting was held at the ASIA Annual Conference in Denver, Colorado on April 21, 2012. In addition to welcoming the SCI-SIG to share their meeting space, the ASIA management helped advertise the event to their members through email blasts. Thanks to the Shepherd Center, a delicious lunch was generously provided for all of these hard-working attendees. We extend a resounding “thank you!”

Well-nourished, SCI-SIG attendees made headway on their plans for the remainder of 2012. Previously, focus was on increasing spinal cord injury programming at the 2012 ACRM Annual Conference, which resulted in even more programming than was offered in 2011.

This year, there will be a plenary session entirely focused on SCI with Canadian researchers Andrei Krassioukov MD, PhD, FRCPC; Brian K. Kwon, MD, PhD, FRCSC and Andrea Townson, MD, FRCPC from the University of British Columbia, Vancouver, BC.

The SCI-SIG Luncheon will feature a session presented by investigators and consumers associated with ICORD, a research center of both the University of British Columbia and the Vancouver Coastal Health Research Institute in Vancouver, BC. There are also several conference programming options for symposia, posters and platforms.

With a strong program ready for the fall, the special interest group is now shifting their focus to developing products that will help to advance SCI rehabilitation and research. They are also working to increase their active membership. Each attendee of the SCI-SIG Mid-Year Meeting was challenged to recruit colleagues into active involvement. Although it's great to have new members, the SIG aims to recruit members with a desire to work.

Want to get involved? The SCI-SIG is interested in developing Education Pages for the ACRM scientific journal, *Archives of Physical Medicine and Rehabilitation*. These pages will be designed to educate clinicians or their patients with SCI and their caregivers, in topics related to care. For instance, Therese Johnston and the FES Task



Force are developing an education page to describe FES cycling, the benefits and the considerations of use. Susie Charlifue and the Caregiver Task Force are developing a brochure related to the needs of the caregiver that can be distributed in doctor's offices. ***If you or your colleagues have an idea for an SCI-related product, the SCI-SIG can help you get it done!***

The SCI-SIG succession plan was also discussed during the Mid-Year Meeting. They are currently in need of a treasurer and a new chair for 2013. Sue Ann Sisto will be leading the nomination efforts. ***If you, or one of your colleagues, is looking for a great group of people with a passion for advancing SCI rehabilitation and research, as well as a leadership position, please contact Sue Ann at ssisto@notes.cc.sunysb.edu.***

This growing and dynamic group invites you to join them as they work to advance SCI rehabilitation and research within the ACRM and SCI communities. ■

CYCLING WITH FUNCTIONAL ELECTRICAL STIMULATION: An Overview of the Evidence

The ability to participate in intensive, aerobic exercise is substantially diminished after sustaining a motor complete spinal cord injury (SCI). Stationary cycling with the assistance of functional electrical stimulation (FES) offers one option for resuming aerobic exercise and is growing in popularity. In addition to improved cardiovascular fitness, there are other presumed benefits from FES cycling, including increased muscle mass, improved bone density, and better metabolic functioning. This article summarizes the empirical evidence available on the effects of FES cycling for individuals with SCI.

Improving the condition of the cardiovascular and respiratory systems is often the reason for starting an FES cycling program. Studies have shown both immediate benefits while cycling, and longer-term increases in oxygen uptake, indicating benefits to the respiratory system. Heart rate typically increases during FES cycling; however, the increase is limited, suggesting that greater intensity of exercise may be needed.

Studies examining muscle have focused on measuring muscle volume and on stimulated muscle strength. Results reported in the literature show that muscle size can improve following FES cycling. Gains are also reported in stimulated strength. The amount of fat in relation to lean tissue has also been studied post-FES cycling with an increase in lean

tissue reported without a concomitant decrease in adipose tissue. Serum lipid levels have not been shown to change post-FES cycling.

Measurements of bone most commonly focus on bone mineral density. The results in the literature are mixed with some studies reporting little or no change across various bone sites and other studies reporting significant change, specifically in the distal femur. While gains in bone and muscle have been reported, FES cycling as currently applied may not be delivering the amount of load needed for better gains. More research into methods to increase load during cycling is warranted.

While published FES cycling studies include mainly those with complete SCI, there are a few studies that report gains for people with incomplete SCI. These studies have shown increases in ASIA motor and sensory scores, self-reported function, muscle size, and walking ability, suggesting the potential for FES cycling to have an impact with this population.

In summary, programs of FES cycling have led to some gains in bone, muscle and cardiovascular/respiratory health. Further research is needed to examine ways to increase load and intensity to understand whether further gains can be made. ■

Rehabilitation Outlook is GOING GREEN!

In our continued effort to reduce ACRM's carbon footprint on the planet, we are striving to reduce the amount of paper we consume. Beginning with our next issue of *Rehabilitation Outlook*, four of the six issues published annually will be delivered to your inbox in a "flippable" electronic format.

You'll receive an email containing a link to the newsletter. When you click on the link, the newsletter will quickly open and you'll be able to "flip" from page to page by clicking — no more slow PDF downloads or scrolling.



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Advertising space will still be available in both print and electronic issues. Please contact Cindy Robinson, crobinson@ACRM.org for details. ♻️



Watch for TBIMS Research Findings in August Issue of ARCHIVES

By Tamara Bushnik, PhD, FACRM, President, ACRM

In the August issue of the ACRM scientific journal, *Archives of Physical Medicine and Rehabilitation*, research findings from the Traumatic Brain Injury Model Systems of Care (TBIMS), which are funded in five-year cycles by the U.S. Department of Education, Office of Special Education and Rehabilitative Services, National Institute on Disability and Rehabilitation Research (NIDRR), will be published in a group of nine articles. This very important program has been conducting cross-cutting traumatic brain injury (TBI) research using a variety of research paradigms since the program was first funded in 1987.

At the end of each grant cycle, the TBIMS strives to publish a compendium of the research findings that have

resulted from the cycle; this set of articles arises from the 2007-2012 grant cycle. As always, there is a mix of research methodologies, number of institutions involved, and at least a subset of the TBIMS National Database is typically used to enrich the research.

The nine articles in this special section include randomized clinical trials, secondary data analysis of the National Database, and supplementary data collection in addition to the National Database to answer specific hypothesis-driven questions. All of the articles emphasize the ability of the NIDRR-funded TBIMS program to facilitate and enhance research designed to ultimately benefit the individual with TBI and their extended community. ■

SUSAN HARKEMA *continued on page 5*

I will also spend some time on what we've been able to translate and what our group's current thinking is on translation and evidence to support translation. I will try to touch on all three of those areas.

JENNY RICHARD: As a professor and researcher, what advice would you offer ACRM members who are early career researchers aspiring to make similar contributions to the treatment and repair of spinal cord injury?

DR. HARKEMA: I think my best advice is to be very perseverant and to identify an area that in some way motivates you. Research can be very tedious and fraught with many things you might consider failures. You submit publications and get denied; you submit grants and don't get funded. However, I think perseverance has been a big contributor to the success of my career.

Secondly, if you are really interested in translation, you should collaborate. If your expertise is in basic science, you should reach out to clinician scientists and clinicians and really collaborate; and vice versa, if your primary training is clinical and you're a practicing clinician, then you should reach out to those who have basic science experience.

We attribute our success to always being paralleled. We had a long-term collaboration with Reggie Edgerton and in every experiment, we had a human basic science component and an animal basic science component and had in mind

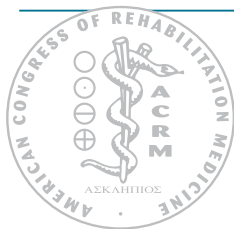
what that translation component would be. That developed over later years, but now all of our questions are driven by the human experience. There are many ways to do research, but if you truly want to do translational research, you have to have interdisciplinary collaborations. You have to listen to each other and get advice from each other and really understand what that human condition is. Many basic scientists probably have discoveries right now that they don't realize could be translated and change people's lives. So I'm always encouraging them to reach out to clinicians in order to translate that information.

JENNY RICHARD: As you know ACRM represents an interdisciplinary community of rehab professionals and what you're saying is true to ACRM's mission — making sure that the research informs clinical practice and vice versa to improve lives. You've been a member of ACRM since 2008. Have you found that to be beneficial in making those connections?

DR. HARKEMA: Yes! When societies put that forward as their mission and develop their programs around getting people from different disciplines together, I think that really helps to move that mission forward. I think the other thing that's really beneficial for societies to do is to bring in the communities, the spinal cord injury communities and other paralysis communities, and have them interact with the basic scientists and the clinicians in a forum where there can be some discussion. That also helps motivate translational research. ■

Susan Harkema, PhD will present the John Stanley Coulter Award Lecture at the 2012 ACRM annual conference, *Progress in Rehabilitation Research*, on Saturday, 13 October in Vancouver, BC.

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