



# SCI Special Interest Group Newsletter Winter 2012

## Letter from the Chair

Hello, Fellow SCI SIG Members!

Welcome to the Winter 2012 Edition of our SCI SIG newsletter! I hope everyone had a restful and safe holiday season. It is that time of year when folks typically reflect on the past 12 months and try to make a few resolutions for the coming year. If you are like me, I think about a few personal things I should try to do to improve my overall health, but once the new year kicks into full swing, I rapidly move into a survival mode for the rest of the school year! But this year is going to be different! This year I want to try to figure out creative ways to keep up with scientific readings! For new members...or even 'old' ones, if you haven't gotten on the APTA website for a while, you can get quick access to APTA's "OpenDoor" portal to evidence-based practice and research papers. The link is: <http://www.apta.org/OpenDoor/>. APTA members can simply log on and select many different search engines (Medline, CINAHL, Cochrane Library, and something called SPORTDiscus). In these databases, you can search for full text articles in your area of interest. Bookmark this link now so when you have a few minutes you are ready to go! Also, don't forget you should be receiving a semi-monthly e-communication called, "Research in Review", sent out by **Randy Trumbower, PT, PhD** on behalf of the Neurology Section. This communication typically presents articles published in the past 4 weeks and on a broad area of both basic science and clinical practice (including SCI), but you can quickly search for articles that may be of interest to you. One tip I got recently was to delete all the articles I don't want from that list and keep only the ones I want to read and immediately save it in a 'ready to read' file! So if you have an unexpected cancellation or a few minutes you can start right in. Keep in mind that "Research in Review" scans APTA's Open Door Portal, Google Scholar, Pub Med and few other search engines as well, but covers just the previous 4 wks.



As promised, we will be continuing our focus on health promotion following SCI. On page 2 of this newsletter, we are fortunate to have **Eileen Collins, RN, PhD**, from the University of Illinois, Chicago who talks us through the process of calculating caloric needs in patients post-SCI. We are very grateful for Dr. Collin's time in helping us to understand this process!

Regarding CSM: It looks like we will have a large turn out again at CSM this year, which will be held in Chicago, IL from Feb 8 to the 11th. Travelling to the conference can be a busy time, so we have tried to include all SCI related programming in this newsletter! Our SCI SIG is sponsoring two great sessions, one on parenting with a spinal cord injury. This Friday morning session is being coordinated by our Nominating Committee Chair, **Heather Hendersen, PT, DPT, NCS**. You can read more about it on page 5. Following that presentation, **Deborah Backus, PhD, PT**, from Emory University and the Shepherd Center in Atlanta, GA will be presenting her work on upper extremity training after SCI. To read more about her presentation also turn to page 5. Our "Clinician's Corner" section, in this newsletter, will feature our "Clinician –

Turned –A –Corner' from clinical care to clinical research! In this segment, our SCI SIG members sit down with Dr. Backus and talk about her perspectives on UE training after SCI, and more personally how she went from a clinician on the floors to a clinical researcher. To see what Dr. Backus has to say, turn to page 7. If you *are* coming to these CSM talks, please plan to show up early as advanced registration suggests there is high interest in the topics this year! Sometimes this is accommodated with a larger room and sometimes it is not. You can find additional educational programming, platform and poster presentation information starting on page 5.

Additionally, our PT student educators will be happy to note that the Neurology Section of the APTA has approved and posted its, 'Entry-Level Educational Curriculum Content Guidelines for Neurology Examination and Evaluation'. You can find this document by typing this title in the search bar on the main APTA webpage ([www.apta.org](http://www.apta.org)), but it should also be available on [neuropt.org](http://neuropt.org) website by the time this makes it to press! We also would like to remind everyone of the strong relationship we have with the International Network of SCI Physiotherapists: <http://www.scipt.org/>. This organization aims to increase awareness of world wide SCI PT issues and provide education, and educational materials, regarding physical therapy to persons with SCI in less resourced countries around the globe. If you have already prepared educational materials, please consider sharing what you can with this group. Take a moment to check out their webpage, familiarize yourself with our US 'Country Representatives', and if you would like to get more involved, just contact a representative nearest you!

Finally, it is also that time of year that we encourage members to get involved within our own SIG! Two positions will become available on our SCI SIG (Secretary and Nominating Committee) next term and their descriptions are noted on page 6. The SIG positions are for 3 year terms and they rotate in June. If this is the year you feel like getting a little more involved, joining a SIG is a great way to do that! Everyone on the SCI SIG wishes all of you a healthy, happy and productive 2012!

Until next time....

Karen J. Hutchinson, PT,DPT, PhD

## In this Newsletter, To Read About:

- ◆ **Determining Caloric Requirements after SCI; See pages 2-4**
- ◆ **CSM Programming; See pages 5-6**
- ◆ **SIG Committee open positions; See page 6**
- ◆ **'Clinician -Turned -a- Corner'; Spotlight on Dr. Deborah Backus; See pages 7-8**



# SCI Special Interest Group Newsletter Winter 2012, pg. 2

## Health Promotion Following SCI Part II: Determining Caloric Requirements

By Karen Hutchinson, PT, DPT, PhD

The Following is the reprint of a communication with Eileen Collins, RN, PhD, FAACVPR, FAAN, who is the Director of the Physical Performance Laboratory at Edward Hines VA Hospital and an Associate Professor in the College of Nursing at University of Illinois, Chicago. She has kindly agreed to serve as one of our experts for this newsletter series on health promotion following SCI and to answer some questions based on her area of research.

*Introduction:* In our last newsletter (<http://www.neuropt.org/go/special-interest-groups/spinal-cord-injury>) we were fortunate to speak with Dr. Ashraf Gorgey from the Department of Veterans Affairs and Virginia Commonwealth University, about determining body composition after spinal cord injury (SCI). We had a discussion about what the proper height/weight standards might be for someone who presents with a significant muscular paralysis (e.g., a suggested BMI cutoff point for obesity would be 22.5kg/m<sup>2</sup> not 25kg/m<sup>2</sup> as currently noted in the able-bodied population). It is unclear the extent to which utilizing weight scales for able-bodied controls applies to persons with SCI because of the significant alteration in body composition that follows SCI. In this newsletter, we have started asking questions about caloric requirements for our patients and have begun estimating how many calories a person should consume per day in order to maintain their current (? healthy) weight. It would be helpful to follow along with her recently published article, *Energy Cost of Physical Activities in Persons with Spinal Cord Injury*, *Med. Sci. Sports Exerc.*; Vol 42, No. 4, pp. 691-700, 2010. Specifically we will be using Tables 3, 4, and 5 in a case example. See if you can follow along with identifying caloric requirements for each physical activity category. If you do not have access to the tables, it is not a problem, you will just have to trust me regarding accuracy of my numbers for the calculations!

**KH: Thanks, Dr. Collins, for agreeing to be with us today. What I would like to do is talk through a**



**case determining caloric requirements for healthy weight for someone with SCI. Our first major question, however, is how do you determine if a patient with SCI has a healthy weight? Are the weight scales used to identify underweight, normal weight, overweight and/or obesity in able-bodied populations applicable post SCI? Or is there an SCI-specific ideal weight chart?**

**Dr. Collins:** To my knowledge, there are no published ideal body weight tables for people who have sustained a spinal cord injury. Since people with SCI have higher body fatness and lower lean mass, the recommendations by the American Dietetic Association for those with SCI are lower than the published guidelines for the general public. For persons with tetraplegia, the published estimates should be reduced by 10-15% (or on average about 7-9 kg; =15 to 20 pounds). For persons with paraplegia, the recommendations are a reduction of 5-10% (or on average 4.5-7 kg =10 to 15 pounds).

**KH:: In your article, “Energy Costs of Physical Activities in Persons with SCI” Med Sci Sport Exercise 2009; you talk about the determination of one metabolic equivalent (MET). One MET is the amount of energy expended during a physical task relative to the amount of energy that would be expended at rest. In your paper, you revealed that the actual value for persons with SCI is between 2.52 and 2.77 ml kg<sup>-1</sup> min<sup>-1</sup> (tetraplegia and paraplegia, respectively) vs the able-bodied value of 3.5 ml kg<sup>-1</sup> min<sup>-1</sup>. For the purposes of determining caloric requirements, is it conceptually helpful to convert activities into METs? If not, when do you want to convert to MET values?**

**Dr. Collins:** We decided that since MET values were used widely in the general literature that it would be helpful to use here as well. There are many published tables of physical activity MET values for the able-bodied. A person with a SCI can simply reduce the MET value by about one-fourth to obtain their MET value. In my opinion, the main reason one would want to know a MET value was if they wanted to use published values for the able-bodied and convert to SCI values.

**KH: Next, I would like to describe a single case, identifying relative daily activity levels and see if you can help me determine what the overall daily caloric intake might need to be. We can first identify what caloric intake would be needed to maintain the current weight and then discuss what**

*Continued on page 3...*



# SCI Special Interest Group Newsletter Winter 2012, pg. 3

**(Cont'd) would be needed if it was agreed that a decrease in body weight would be beneficial. [The first step you need to do is catalogue what kinds of activities (ADLs, Work Activities, Leisure Activities) that the person is currently participating in per day and for how many minutes per day. If there is an activity that only occurs a few times a wk, then on those days you add in the extra energy expenditure information. Here's our case, Mindy. ]**

**Case:** Mindy is a 42 yo female who sustained a motor complete SCI in 1999 at the T<sub>9</sub> level. Clinic measures reveal that she is 5'5" tall and weighs approximately 152 pounds (considered overweight, 25.3 BMI). Mindy gets herself ready for work every morning even though it takes her 75 minutes to shower, change and complete her bowel program. She prepares all her own meals, washes her dishes and makes her bed daily. She completes laundry twice a wk, but has assistance with other house cleaning efforts (she does not vacuum, dust, etc). She works 20 hours per wk as an office assistant (desk job- 4 hours a day) for a busy dentist practice. Mindy does like to exercise and 2 times a wk she will go to the local YMCA and lift light weights with her arms for about 30 minutes. She propels her wheelchair approximately 100 yards from parking lot to desk and back again at the end of the day (5 min each way), and she estimates that the short bursts of propulsion during the day results in about an additional cumulative 15 minutes of propulsion in between areas at work, to lunch, and again at night at home. I've tried to capture this activity in chart form.

The asterisk \* means we used data determined on males or closest available injury to calculate values.

*Continued on page 4...*

Activity	kcal/ min	Duration	Total Energy Requirement (Total Activity; kcal)
Morning Showering	* 3.10	30 min	93
Dressing	* 3.63	30 min	109
Bed making	* 3.31	5 min	17
Driving	* 2.32	30 min RT	70
Wheeling on Sidewalk	2.62	10 min	26
Wheeling on Carpet	2.92	15 min	44
Deskwork	* 1.66	4 hours (240 min)	398
Wheeling on Tile	3.05	15 min	46
Washing Dishes	1.89	10 min	19
Lifts Weight 2x / wk	2.44	30 min	72
Laundry 2x/wk	* 3.17	20	63
Grocery Shop. 1x/wk	* 2.59	40	104
<b>Totals</b>		<b>475 min</b>	<b>1061 kcals/day</b>



# SCI Special Interest Group Newsletter Winter 2012, pg. 4

**KH:** The energy requirements for activities listed are taken from the article by Dr. Collins. Energy requirement data for males with complete injury (Table 3), males with incomplete injury (Table 4) and females with both complete and incomplete injuries (Table 5) were used. Our table here represents approximate values of caloric requirements since, for example showering data, were collected solely on males with incomplete injuries in this study so we substituted when needed to calculate the activity.

You can see the total values at the bottom of each column for total minutes of activity (above resting energy expenditure=475 min) and total kcals required for this activity. This comes out to 1061 kcals of added energy requirements. What's the best way to calculate her daily kcal requirements given this activity level?

**Dr. Collins:** This is a complicated question. A group from the Palo Alto VA (Dr. Jenny Kiratli heads up the team), are doing research to develop nutritional guidelines for people with SCI. There are published equations to compute kcal requirements. These are based on body weight and are difficult to compute in your head. The kcal numbers in our compendium do not account for differences in body size. So, when using these numbers, one needs to keep in mind that this number can be higher or lower depending on body size and metabolism. However using our data, Resting Energy Expenditure (REE) for people with SCI was  $0.99 \pm 0.19 \text{ kcal}\cdot\text{min}^{-1}$ . To make it easy, we will use  $1 \text{ kcal}\cdot\text{min}^{-1}$  for a REE value. This would compute to  $1440 \text{ kcals}\cdot\text{day}^{-1}$  ( $24 \text{ hr} * 60 \text{ min} * 1 \text{ kcal}$ ). According to the list above, this individual expended 1061 kcals over the course of the day in physical activity. We need to subtract the resting energy expenditure from the values above and come up with 586 additional kcals. The caloric requirements for this individual, with this activity level, would be approximately  $2026 \text{ kcals}\cdot\text{day}^{-1}$ .

**KH:** So you take 1440 minutes in a day (24 hours x 60 min) and subtract the number of minutes with greater than resting energy demands ( $1440 - 475 = 965 \text{ min}$ ). This gives you how many minutes per day are truly at rest (965 min)

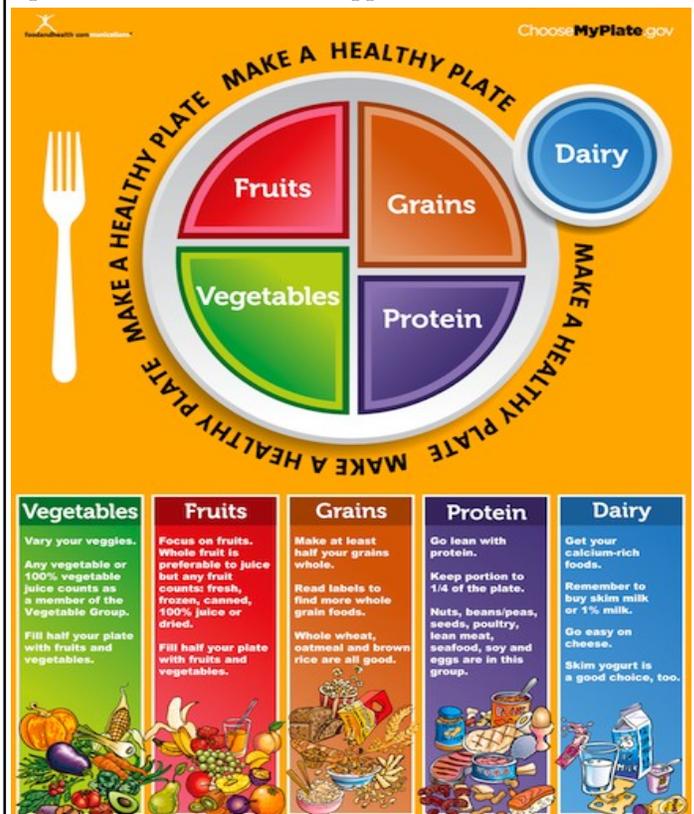
which you multiply by REE value ( $1 \text{ kcal}/\text{min}$ ). Then you need to calculate the number of minutes per day completing activities (475 min), and the energy requirements for them (using the values noted in the table above keeping out activities done on a wklly basis and adding those in- in addition- only on the days completed).

So 965 minutes per day at resting values ( $1 \text{ kcal}/\text{min}$ ) will require 965 kcals per day ( $1440 - 475$ ). This person's activity level requires an additional 1,061 kcals of added energy requirements...so together ( $965 + 1061$ ) the caloric requirement for this person with this level of activity would be 2026 kcals/day!

**Dr. Collins:** That's how I did it.

**KH:** Thanks Dr. Collins!

For more details on activities captured in this study, please see , "Energy Costs of Physical Activities in Persons with Spinal Cord Injury", EG Collins, D Gater, J Kiratli, J Butler, K Hanson, WE Langbein, Med. Sci. Sports Exerc., Vol 42, No.4, pp. 691-700, 2010.



New My Plate replaces USDA Food Pyramid  
<http://www.choosemyplate.gov/>



# SCI Special Interest Group Newsletter Winter 2012, pg. 5

## COME SEE THE SCI CONTENT AT CSM IN CHICAGO!!!

*The following 2 sessions are Sponsored by the SCI-SIG*

### **Parenting After Spinal Cord Injury**

**Time:** 8:00 am-9:30 am (Joint Program: Women's Health) Friday, Feb 10th

**Speaker:** **Heather K. Henderson, PT, DPT, NCS**

There is extensive research on fertility and the ability of people with spinal cord injury (SCI) to become parents; however, little has focused on what comes next: parenting with physical limitations. Participants will interact with a panel of experts in the team approach to parenting after SCI. Panel members will include PT, OT, rehab engineer, and parents with SCI. Discussion will include functional considerations during pregnancy/labor and delivery, pre-delivery infant care training, parent adaptive devices for mobility, infant/toddler care adaptive devices, adaptive techniques for infant/toddler care, ergonomics, and energy conservation.

### **Spinal Cord Injury SIG: Exploring the Potential for Upper-Limb Functional Improvements in People With SCI**

**Time:** 10:30 am-12:00 pm, Friday, Feb 10th

**Speaker:** **Deborah Backus, PT, PhD\***

Evidence shows that people with incomplete spinal cord injury (SCI) have potential for upper limb (UL) function improvement, and that the underlying recovery mechanisms may be neurally mediated. Data will be presented showing improved somatosensory perception, motor output, and function in people with chronic incomplete tetraplegia. Although preliminary, these findings suggest that treatment to improve UL function should focus on improving motor control, not just compensation. This presentation will also discuss the application of the principles underlying the facilitation of neural plasticity and functional changes (intensity, repeated practice, attention, and somatosensory augmentation) for improving UL function in people with tetraplegia. The use of interventions combining repeated movement, somatosensory augmentation, and attention/focus may lead to greater improvements in UL function in people with either acute or chronic incomplete tetraplegia.

*\* Check out the Clinician -Turned -a- Corner; Spotlight on Dr. Debbie Backus, page 7-8*

### *Additional SCI Symposia*

#### **Knowledge to Action: Evidence, Collaboration, and Improved Patient Outcomes in Neurorehabilitation**

**Time:** 8:00 am-10:00 am (See Program for Room) Friday, Feb 10th

**Speakers:** **Sue Ann Sisto, PT, PhD; Katherine J. Sullivan, PT, PhD; Mary Schmidt, PT, DPT, MS; Julie J. Hershberg, PT, DPT, NCS**

Knowledge translation (KT) is a dynamic, interactive process between rehabilitation researchers and evidence-based clinicians. KT integrates new knowledge from clinical research with the realities of clinical practice to create innovative approaches to clinical care. This session demonstrates how partnerships between rehabilitation researchers and clinicians can create KT strategies in the clinical setting, which can lead to health improvements for children and adults with disabilities. Three examples demonstrate how the KT process can translate knowledge to action in the clinical environment. Rehabilitation researchers and clinical specialists will lead you through an interactive knowledge-to-action session, and in the process, identify KT messages that can be shared in the clinic or educational settings.

### *SCI Platform Presentations*

#### **Neurology Section:**

Friday Feb 10<sup>th</sup> **Time:** 10:30 am-10:45 am **Locomotion Across Multiple Neurological Patient Populations: Mechanisms of Walking Recovery in Adults with Incomplete Spinal Cord Injury.** **Speaker:** Emily J. Fox, PT, DPT, MHS

#### **Research Section:**

Friday Feb 10<sup>th</sup> **Time:** 5:10 pm-5:30 pm

**Asymmetry in Hind-Limb Muscle Atrophy Following Spinal Cord Injury and Cast Immobilization in Rats**  
**Speaker:** Woo Taek Lim, PT

### *SCI Posters #3182-3197*

**Neurology: SCI SIG Saturday February 11, 2012 11:00am-3:00pm**

3182 **Kids STEP Study: Locomotor training outcomes and use of select long tracts as predictive biomarkers of responsiveness after chronic, incomplete spinal cord injury.** *Behrman A, Fox EJ, Trimble SA, Suter S, Senesac C, Tester NJ, Kleim J, Howland DR*

3183 **Reorganization of spinal neural circuits after locomotor training in human spinal cord injury** *Knikou M, Hajela N, Smith AC, Mummidisetty CK, Rymer ZW*

3184 **Reliability and validity of using a robotic exoskeleton to assess lower limb static position sense in persons with spinal cord injury** *Domingo A, Lam T*

*Continued on Page 6...*

3185 **Power versus Manual? Wheelchair Intervention**



# SCI Special Interest Group Newsletter Winter 2012, pg. 6

## SCI CONTENT AT CSM IN CHICAGO CONTINUED

### SCI Posters (continued)

3185 Power versus Manual? Wheelchair intervention trends for individuals with low level tetraplegia: findings from the SCIREhab Study *LaBarbera J, Natale A, Gassaway J*

3186 Effects of passive standing, dynamic standing, and dynamic standing augmented by functional electrical stimulation on urinary calcium, spasticity, and bowel function in a person with paraplegia *Day BE, Simpson DJ, Diez E*

3187 Targeting supramaximal strength in incomplete spinal cord injury: Time and intensity dependent increase in volitional torque generation *Thompson C, Jayaraman A, Hornby T*

3188 Whole-body vibration as a conditioning intervention prior to locomotor training in individuals with incomplete spinal cord injury *Fenton J, Foster A, Mills A, Taylor K, Field-Fote EC*

3189 Neuromuscular plasticity in the rat forelimb after cervical spinal cord injury *Gonzalez-Rothi EJ, Fuller DD, Federico R, Vandeborne K, Reier PJ, Lane MA*

3190 Operant conditioning of tibialis anterior and soleus H-reflex improves spinal reflex modulation and walking function in individuals with motor-incomplete spinal cord injury *Manella KJ, Field-Fote EC*

3191 Manual wheelchair wheelie training by physical therapists in inpatient spinal cord injury rehabilitation *Casperson KM, Teeter LM*

3192 Movement system diagnosis and management of a patient with an incomplete spinal cord injury *Horan L, Cornbleet SL*

3193 Can changes in hand position favorably alter shoulder kinematics during circuit resistance training in individuals with paraplegia? *Riek LM, Ludewig PM, Tome J, Nawoczenski DA*

3194 Patterns in seating equipment evaluation/provision and patient satisfaction: findings from the SCIREhab Project *Taylor Schroeder S*

3195 Patterns in manual and power wheelchair training: findings from the SCIREhab Project *Taylor Schroeder S*

3196 Increased functional mobility after implementation of activity based locomotor training in an individual with chronic incomplete spinal cord injury *Ostertag SA, McDonald A*

3197 Treadmill training with Lokomat-applied resistance to enhance functional ambulation in people with incomplete spinal cord injury *Lam T, Pauhl K, Bigelow A,*

*Krassioukov A, Eng J*

### Want to be more involved in the Spinal Cord Injury SIG ?

Here are the current openings:

#### Duties and Responsibilities: SIG Secretary

- Records the minutes of all SIG meetings and conference calls.
- Maintains a record of all official actions and decisions of the SIG.
- Submits minutes of SIG meetings (CSM, AC, Retreats, conference calls) to the SIG officers and Executive Office within twenty-one (21) days of the meeting.
- Attends the SIG meeting with the Vice President at CSM.
- Assists the Chair in preparation and submission to the Executive Committee a 3 year plan for the SIG.
- Coordinates updating of Policy & Procedures Manual with the Vice President of Neurology Section.
- Receives and submits newsletter
- Provides for orientation of a successor

#### Duties and Responsibilities: SIG Nominating Committee

- Need to be a member of the Neurology Section for 2 years before running
- Prepares annually a slate of two (2) or more candidates for each open SIG office.
- Coordinates with the Executive Office Nominating Committee chair election process.
- Conducts elections by electronic and mail ballot in conjunction with the Executive Officer.
- Requests recommendations for nominees from incumbent officers and Section members in October and routinely checks database on neurology section website.

If you are interested, all you need to do is fill out the consent form online through the Neurology Section Website at <http://www.neuropt.org/go/nominating>. If you are considering it and have a few questions, please feel free to contact one of the nominating committee members:

Heather Henderson, PT, DPT, NCS - Chair  
E-mail: [heather.henderson@rosalindfranklin.edu](mailto:heather.henderson@rosalindfranklin.edu)

Twala Maresh, PT, DPT, NCS

E-mail: [twalam@uca.edu](mailto:twalam@uca.edu)

Lauren McCollough, PT, DPT

E-mail: [lauren\\_mccollough@shepherd.org](mailto:lauren_mccollough@shepherd.org)

**Mark your calendar for the upcoming  
SCI course!**

**American Spinal Injury Association (ASIA)  
38th Annual Scientific Meeting, April 19-21, 2012**

**Pre-Course:** "Gait Assessment and Treatment: New Approaches and Advanced Technologies"

Wednesday, April 18, 2012

Presented by local host Craig Hospital, Denver, Colorado

Website: [www.asia-spinalinjury.org](http://www.asia-spinalinjury.org)



# SCI Special Interest Group Newsletter Winter 2012, pg. 7

## Clinician -Turned -a- Corner; Spotlight on Debbie Backus



*Deborah Backus, PT, PhD is Associate Director of Spinal Cord Injury Research at Shepherd Center in Atlanta, Georgia. Dr. Backus is an experienced physical therapist, educator, and researcher dedicated to facilitating interaction between*

*basic scientists, clinical researchers, and clinicians interested in improving outcomes for people with spinal cord injury (SCI). She received her B.S. in Physical Therapy in 1986, and her Ph.D. in neuroscience in 2004. Dr. Backus' research efforts are focused in two areas related to improving the health and function of persons with spinal cord injury. The first is centered on evaluating motor control, and its recovery, in the upper limb of people with incomplete SCI. The second is focused on facilitating the translation of rehabilitation research into efficacious and cost-effective treatment interventions and programs to maximize positive outcomes in people with SCI. Dr. Backus also serves as the Director of the Jesse Crawford Research Mentoring Program, and works closely with clinicians to identify meaningful clinical research questions and tools, to facilitate their participation in the research process, and to promote translation of evidence into ethical and effective clinical practice. Dr. Backus was recently the recipient of the American Congress of Rehabilitation Deborah L. Wilkerson Early Career Award in Rehabilitation Research and strives to continue to empower people of all ages, sizes and abilities to achieve their greatest potential in life.*

Questions submitted by: **Twala Maresh, PT, DPT, NCS**

**What interested you in pursuing a research graduate degree?** I had been a PT for several years prior to deciding to go back to school for my doctorate. I loved being a treating therapist, but I found myself wanting to know more about the effects of what we, as PTs, were doing, what our interventions were doing to affect change in the nervous system and leading (sometimes) to functional changes in our patients. I was (and still am) particularly interested in the sensory-motor interactions and their role in motor control, and really interested in the role of somato-sensation in motor recovery.

**Why is recovery from neurologic injury your research focus?** As PTs, we strive to facilitate our patients' full recovery, and we should always critically make choices of what interventions to use and how to modify for any given patient. Yet, we have such a shortage of evidence to support what we do, so I made it my mission to address this area of work, specifically as it relates to upper limb function in people with neurological injury or disease.

**Do you think that having a clinical background enhances your research? If so, how does clinical practice direct your research process?** Yes, I do think that my clinical background enhances my research and what I do on a daily basis. In my own research, my clinical training and experience drives my interest and research questions. The people with incomplete SCI, who have motor control deficits, are who drive me the most. They, and specifically their upper limbs, are underserved, primarily because we just do not truly understand the mechanisms underlying their functional deficits. As one of my primary responsibilities as Associate Director of SCI Research and Director of the Jesse Crawford Mentoring program, I interact with clinicians who are interested in participating in research activities but who have significant clinical responsibilities. Because I was a clinician first, I understand what they have to do on a daily basis and thus work more effectively with them to identify ways in which they can participate in the research process, either by assisting with ongoing studies or by conducting case studies and pilot projects to address their own clinical research questions. Finally, my clinical experience is beneficial when collaborating with basic scientists. I can assist them in identifying meaningful questions or choosing the best outcome measures that would relate to the clinical population. I can also help translate their basic science evidence into meaningful information for the clinicians.

**What advice do you have for the therapist working with patients with SCI in acute rehab regarding activity based therapy and development of independent skills prior to discharge? For example, when should treatment for SCI UE function focus on compensation versus recovery in this environment?** This is an excellent question, and I am not sure we are where any of us could answer this question without hesitation. We just do not know when it is "best" to facilitate recovery – is there a time that is too early, is there a time that is too late? Is there an optimal window of opportunity during which activity based interventions will be most beneficial, and not harmful?

I do believe that any person with motor incomplete SCI (AIS C or D) should have the opportunity to optimize their function. This means that they should be given the opportunity to participate in, or access, activity based interventions that will place a demand on the muscles and nerves distal to their injury site. BUT BY ALL MEANS, ALL people should also learn to be as independent as possible, while they are striving to improve function distal to their level of injury. This could be done by working on compensation during therapy sessions, and then using activity based interventions during non-therapy hours, such as at the end of the day, in the evenings or on the weekend. They have to be able to participate in their daily life, even while trying to facilitate recovery. This means using their strengths to perform transfers, bed mobility and locomotion, whether in a wheelchair or via walking. I always tell the people with whom I work that they need to multi-task. Recovery is a long process, more like a marathon than a sprint, and therefore they need to live their life while they are on that long road of recovery. This applies for acute rehab as well as post-acute endeavors.



# SCI Special Interest Group Newsletter Winter 2012, pg. 8

## Clinician -Turned -a- Corner; Spotlight on Debbie Backus, cont.

### **Any suggestions for carryover of your research into the home/ community environment?**

One thing that is clear from the research related to activity based interventions is that activity, and repetition of the activity, is key. There is also a time for pure strengthening, as well as a time for retraining motor control. People need to be given the opportunity to practice tasks even when not in a rehab program. It is difficult, however, because without the evidence that one can improve, even chronically after SCI, there is little to no support for this. I suggest that people hook up with trainers who are versed in working with people with neural injury and motor control deficits, and really work on strengthening and practicing tasks. I also believe that the rehabilitation profession, and especially PTs, should lead the charge in establishing gyms or programs where people can access activity based interventions without needing clinical intervention. This doesn't mean that PTs will be out of work! This just means that the patients will come to the PTs to establish their programs, and to retrain once they are strong enough. People cannot stay in the rehab centers the entire time it takes for the nervous system to respond to the injury and to remodel and recover. First, this will not serve them well – they have lives to live! Furthermore, this is just too costly. Having them participate in intense activity until they gain enough strength and control to build on that for motor skill, then return to therapy, will improve the utilization of resources, and do what we really want for our patients, help them get back to their life.

**What do you see as the next important goal of Activity Based Therapy (ABT)?** It is clear that activity, and not just motor but also with somato-sensory augmentation, can lead to improved function in people with incomplete SCI. Furthermore, these functional changes are often accompanied by (maybe caused by) neural changes along the neural axis. What is less clear is for whom which interventions work best to facilitate optimal outcomes, and what parameters should be applied for any given patient. We need to next focus on understanding the dosage, timing, and individual needs as they relate to activity based interventions.

### **What gets you energized as a researcher?**

I still get excited and energized when someone is helped by the research we are doing. I know that we are not delivering care, but when I see a hint that what we are studying may in fact inform clinical care, and in a positive way, I just love it! The discovery and the interpretation and implementation just really energize me. Working at Shepherd is great for me. As we make our discoveries, we can immediately look for ways to apply the evidence (as appropriate) into clinical practice.

### **What keeps you motivated to continue your research?**

Three things: the patients and their needs, and the fact that we need this evidence to help improve their quality of life; the questions, the need to know how to best help our patients; the clinicians who are seeking the answers and who thrive on

learning more about what to do, and who strive to learn how to participate in the research process.

### **What do you find to be the most challenging aspect of research?**

Getting the funding!!

### **What are 2 suggestions that you would give to the clinician who wishes to begin a research project or is considering going back to school to pursue a research degree?**

First, get the education – even if it is a short research course offered locally. We offer an annual research course designed for clinicians at Shepherd, which gives them some of the basic tools they need to design their own research project. Second, do find a mentor, someone with research experience, who can help you through the process. This will help keep you stay focused and make you more likely to be successful.

### **How do you balance family and a busy career? Any advice?**

Oh, that is a tough one, and a moving target! I have three children and a wonderful husband who (unfortunately?) travels a great deal for his job in international business development. We have worked together on this for 22+ years. For me, when forced to choose, family always comes first. That might mean that I do not progress quite as quickly as some of my peers who either do not have families, or who have a partner who stays at home, or who have live-in help, but that is our choice. My kids are great. They understand that I love what I do and that it is important to me. When necessary, they have come to work with me, either to the rehab center or to Emory University. My students have usually met at least one or two of my kids. There are many times when I have sat at one of their games with my computer or papers I am grading on my lap. Multi-tasking is a great skill! There are also times when I am up until 3am to get it done because I needed to do something with the kids all day. I also was lucky to have a colleague tell me how he used to bring one of his kids with him when he traveled, so I have started doing that as well. I have taken two of my kids with me on their own trips for conferences and meetings. It has been a very special time for us. They see and learn more about what I do for my living and get one on one time with me when I am not in the conference or meeting activities. I also am fortunate that I have worked for and with people who also value family, and who are very supportive of my efforts and me. AND, I have a wonderful team of people with whom I work. I have a great study coordinator and lab administrator who keeps me honest and on task when I need reminders. They make it all work. We work very well as a team, all with the same goals – to discover.

It can be done, but there is no one answer, and no one solution that has worked consistently over the years. But I will tell you, my oldest child, a 15-year old girl, intends to have a professional career (right now as a lawyer) and intends to have a family – she loves her life, and believes that she, too, can have it all. So I guess it all is working pretty well.

**Thanks, Dr. Backus, for a very interesting Interview!!**