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Feature

THE
**BAREFOOT
RUNNING
REVOLUTION**

Dr. Irene Davis is taking a new look at long accepted interventions.

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Summer 2011

spaulding *now*

Focus on Research

Supporting Wounded Warriors

Spaulding is part of the new BADER research consortium that will examine ways for soldiers with impaired musculoskeletal structures and limb amputations to reach new levels of function.

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Latest News

Rebuilding a Red Sox Prospect

Ryan Westmoreland was a top prospect bound for the big leagues. A complex brain injury threw him a curveball that led him to Spaulding and the start of his recovery.

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Resident Profile

From the Paralympics to PM&R

Few can understand the parallels between a marathon and rehab as innately as Dr. Cheri Blauwet. Even fewer know what it's like to be counted among the world's best athletes.

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Brief Sampling of Presentations

Joseph Giacino, PhD, *A Multi-Center Randomized Controlled Trial of the Effectiveness of Amantadine Hydrochloride in Promoting Recovery of Function Following Severe TBI*. Symposium lecture at the 2010 ACRM-ASNR Joint Educational Conference, Progress in Rehabilitation Research, Montreal, Canada.

Jeff Widrick, PhD, *Fiber myosin heavy chain polymorphism is associated with a heightened susceptibility to eccentric damage*. 55th Annual Meeting of the Biophysical Society, Baltimore, MD.

Paolo Bonato PhD, *New Frontiers in Wearable Technology and its Medical Applications* (keynote lecture), Primeras Jornadas Cientificas, Campus de Excelencia Internacional, Madrid, Spain.

Brief Sampling of Publications

1. **Fregni F**, Potvin K, Dasilva D, Wang X, Lenkinski RE, Freedman SD, et al. Clinical effects and brain metabolic correlates in non-invasive cortical neuromodulation for visceral pain. *Eur J Pain*. 2011;15(1):53-60. PMID: 3000866.

2. Mavroidis C, Ranky RG, Sivak ML, Patritti BL, DiPisa J, Caddle A, **Bonato P**, et al. Patient specific ankle-foot orthoses using rapid prototyping. *J Neuroeng Rehabil*. 2011;8:1. PMID: 3024934.

3. Brunoni A NM, Bolognini N, Bikson M, Merabet L, Valero-Cabre A, Rotenberg A, Pascual-Leone A, Ferrucci R, Priori A, Boggio P, **Fregni F**. Clinical Research with Transcranial Direct Current Stimulation (tDCS): Challenges and Future Directions. *Brain Stimulation* 2011 (In Press).

4. **Suri P**, Hunter DJ, Jouve C, Hartigan C, Limke J, Pena E, et al. Nonsurgical treatment of lumbar disk herniation: are outcomes different in older adults? *J Am Geriatr Soc*. 2011;59(3):423-9. PMID: 3102576.

5. **Widrick JJ**, JS, Choi SJ, Knuth ST, Morcos PA. An octaguanidine-morpholino oligo conjugate improves muscle function of mdx mice. *Muscle Nerve*. 2011.

6. Seel RT SM, Whyte J, Katz DI, **Giacino JT**, Rosenbaum AM, Hammond FM, Kalmar K, Pape TL, **Zafonte R**, Biester RC, Kaelin D, Kean J, Zasler N, R. American Congress of Rehabilitation Medicine, Brain Injury-Interdisciplinary Special Interest Group, Disorders of Consciousness Task Force.

7. **Suri P**, Rainville J, Kalichman L, Katz JN. Does this older adult with lower extremity pain have the clinical syndrome of lumbar spinal stenosis? *JAMA*. 2010;304(23):2628-36.

8. Brunoni AR, Amadera J, Berbel B, Volz MS, Rizzerio BG, **Fregni F**. A systematic review on reporting and assessment of adverse effects associated with transcranial direct current stimulation. *Int J Neuropsychopharmacol*. 2011;1-13.

For a full listing visit <http://pmr.hms.harvard.edu>

From the Chair

The power of SPORTS

A Message from Ross Zafonte, DO



Colleagues,

As we all welcome the warm weather it's always a reminder of new beginnings. June is an exciting time for the Department for many reasons. First and foremost, because we as a department celebrate our 16th graduating class at the Harvard Club in

Boston. It's always gratifying to welcome our distinguished alumni, current faculty, residents and fellows and of course, our proud graduates and their families. While there is no telling what the road ahead holds for this next generation of physiatrists, I have no doubt that their mix of dynamic talent and intellectual prowess will only serve to enrich our field and the communities we serve.

With these warmer and longer days in every corner of the country, the roads, trails and fields see every type of athlete from youth sports to the weekend warrior. One of our critical areas of focus in rehab is sports medicine and looking for novel ways through care and research to ensure people can stay active over the course of their lives. In this issue, we focus on sports medicine in several areas, from the addition of the talented Dr. Irene Davis to our Department and her investigations into new approaches in running mechanics to our resident profile of Dr. Cheri Blauwet, a two-time Boston Marathon wheelchair division champion and rising clinician.

Sports is such a unifying thread throughout so many aspects of our society, allowing us as clinicians and scientists to have a wide breadth of research and impact. The power of sports can be seen in cases such as Ryan Westmoreland, a touted prospect for the Red Sox who faced a brain tumor that caused a significant TBI. His story and care at Spaulding were featured on ESPN and showed just how sports can be used in tandem with clinical care to help a patient stay motivated and active in their recovery. We were also extremely proud to partner with the Red Sox on the recent Run to Home Base event, raising over \$2.5 million to support care and research for our returning heroes.

Perhaps there is no better metaphor from sports than that of the team. I'm proud to say that at the recent AAP conference, our team was recognized in several areas from poster and paper submissions to presentations for their innovative work on the academic, research and clinical fronts. In this season of celebration, I can think of nothing more gratifying than this recognition by our peers. Truly, by always challenging each other to advance our collective knowledge, the most important person on each one of our teams is the one who wins; our patients that depend on us to continually improve the biology of recovery. ■

Ross Zafonte, DO

Professor and Chairman of Physical Medicine and Rehabilitation
Vice-President, Medical Affairs, Research, and Education

Focus on Faculty

Exploring New Avenues of Care



Dr. Ariana Vora

Collaborations Across Continents

ARIANA VORA, MD, staff physiatrist in the Physical Medicine and Rehabilitation Department at Spaulding Rehabilitation Hospital and Massachusetts General Hospital, recently served as a visiting professor at the University of Pune Medical School in Pune, India. Dr. Vora participated in a cross-cultural dialogue that compared the ancient system of Indian medicine—Ayurveda—with western medicine, focusing on opportunities for clinical and research collaboration. She presented at Grand Rounds, introducing the fundamentals of physical medicine and rehabilitation, and facilitating a discussion of basic epistemology and clinical questions that could be explored between PM&R and Ayurveda. She also initiated ongoing discussions with faculty regarding the design of several academic undertakings at the University. ■



Dr. Lauren Elson

A Passion for Performance Arts

LAUREN ELSON, MD brings a unique perspective and understanding to her work in sports medicine. She has worked in some of the most demanding athletic settings from NCAA Division I athletes to covering multiple endurance races and marathons, including the Racing the Planet series in Chile and Egypt, the World's Strongest Man Competition, and United Football League Games. However, as a former professional dancer, her true passion is taking care of dancers and performing artists.

With more than 25 years of experience as a dancer including training in ballet, jazz, tap, hip-hop, African dance, modern, pilates and yoga, she understands the goals and challenges of this physically active population. Dr. Elson is interested in developing dance health and education programs in the Boston area including pre-pointe and injury prevention evaluations. She also shares her expertise on a national level serving on the Dance USA Taskforce on Dance Health, as a member of the International Association of Dance Medicine and Science and the Performing Arts Medical Association. ■

Research

Dr. Pradeep Suri

Exploring Lumbar Spinal Disorders

AS AN RMSTP FELLOW, Dr. Pradeep Suri is conducting research on the epidemiology of degenerative lumbar spinal disorders under the mentorship of Dr. Jeffrey N. Katz. His work involves the



identification of traditional and novel risk factors associated with pathoanatomic spinal degeneration, symptomatic disease, and functional limitations in the Framingham Heart Study Offspring and Gen 3 cohorts. Dr. Suri currently holds an academic appointment in the Department of Physical Medicine and Rehabilitation at Harvard Medical School.

Dr. Suri obtained his medical degree from the University of Michigan Medical School and completed his residency training in Physical Medicine and Rehabilitation at the University of Washington. After attending in Spine and EMG clinics in the Puget Sound VA system, he decided to pursue subspecialty training, going on to complete a Spine and Musculoskeletal Fellowship at New England Baptist Hospital in Boston.

Dr. Suri was recently featured in the *Journal of the American Medical Association* for his work on "Does This Older Adult With Lower Extremity Pain Have the Clinical Syndrome of Lumbar Spinal Stenosis?" ■

THE BAREFOOT RUNNING REVOLUTION

Irene Davis, PhD, Biography

» Dr. Davis has given nearly 300 lectures both nationally and internationally and authored nearly 100 publications on the topic of lower extremity mechanics during running. She has been active professionally in the American Physical Therapy Association, the American Society of Biomechanics, and International Society of Biomechanics. She is also a Fellow of the American College of Sports Medicine and a Catherine Worthingham Fellow of the



Dr. Davis' keynote address at the 2011 Australasian Podiatry Conference

American Physical Therapy Association and a Past-President of the American Society of Biomechanics. She has organized and coordinated national research retreats on topics of the foot and ankle, anterior cruciate ligament injuries and patellofemoral pain syndrome. She has been featured on ABC World News Tonight, Good Morning America, Discovery, the New York Times, the Wall Street Journal, Parade and Time.



Dr. Irene Davis—the “Barefoot Running Professor”— joins the Spaulding Rehabilitation Network and Harvard Medical School.

FROM ELITE RUNNERS to weekend warriors, the perception is generally held that today's sneakers provide more support, comfort and reduce injury prevalence while improving performance. However new research has led many scientists and physicians to question that basic premise. As sneakers have become more complex and orthotics more prescribed many have begun to rethink the entire approach towards foot treatment. This “barefoot running revolution” has led to new simplified sneakers and approaches towards rehab treatments, strength training and analysis. Among those leading the way is the latest addition to the Harvard Medical School's Department of PM&R at Spaulding, Dr. Irene Davis.

“We seldom prescribe a neck brace as a permanent solution for neck pain, and yet it is not uncommon to prescribe a permanent foot brace (orthosis) for someone with foot pain. I firmly believe the approach we take with orthotics on the foot needs to be reexamined,” said Dr. Davis.

“My research has led me to consider that by encouraging minimal footwear we actually make the foot stronger over time. The human body is a remarkable machine and is engineered to perform without the need for \$200 running sneakers.”

Known in running circles as “The Barefoot Running Professor,” Dr. Davis' ground-breaking work in examining gait analysis by looking at factors such as the relationship between posture, running styles and step impact has produced significant results for her patients and new avenues of research. Her investigations into the biomechanics of running has established relationships between faulty mechanics and overuse injuries such as tibial stress fractures and patellofemoral disorders. This has led to the development of innovative interventions such as gait retraining, aimed at altering faulty running mechanics.

A major focus for Dr. Davis as she comes to Boston is leading the establishment of the Spaulding National Running Center. The center will be comprised of the Running Injury Clinic as well as the Running Research Laboratory. The clinic will focus on the evaluation, treatment and prevention of running-related musculoskeletal injuries, while the research lab will feature running biomechanical studies. Merging Dr. Davis' extensive research, academic and clinical expertise with the epicenter of running in the US should provide runners of all levels programs and findings that will improve injury prevention and performance for many miles to come, no matter what footwear they choose. ■

In the news

» Back from the Brink: *Discover Magazine*

DR. JOSEPH GIACINO, Director of Rehabilitation Neuropsychology at Spaulding was recently featured in the March *Discover Magazine* cover story "Back from the Brink" by Kat McGowan. The article focused on Dr. Giacino's work on developing the disorders of consciousness program at Spaulding and his groundbreaking work uncovering treatments for patients in minimally conscious and vegetative states. ■



» Rebuilding Ryan

DRAFTED BY HIS BOYHOOD TEAM, the Boston Red Sox, Ryan Westmoreland had the brightest of futures. Noted for his smooth left-handed swing, he could hit towering home runs with ease. At the start of spring training 2010, Ryan would face a challenge far tougher than a 95mph fastball. An MRI revealed cavernous malformation of the brain, and worst of all it was lodged in his brainstem. Soon the malformation began to bleed, meaning the only option was removal. Dr. Robert Spetzler, chairman of neurosurgery at the Barrow Neurological Institute at St. Joseph's Hospital in Phoenix performed the delicate surgery. The Westmoreland's and Red Sox ownership conferred on the only place for Ryan to begin his road back, Spaulding.

Under the care of his clinical team led by Dr. Ross Zafonte, Ryan began the painstaking process of relearning even the most basic aspects of life. The care team ran Ryan through rigorous physical and cognitive drills. Long before he could pick a bat up again he simply had to relearn how to speak, walk and think. The same focus that served him as an elite athlete allowed him to excel at his rehab. Baseball served as a motivator and touchstone from going to games at Fenway Park or finding simple ways to incorporate baseball into his therapies. While there is still a long road ahead, Ryan has already served as an inspiration. His story has been featured by ESPN's E60 and a *Boston Globe* feature "Rebuilding Ryan." ■

Research



Supporting Wounded Warriors

WITH THE LEAPS FORWARD in battlefield medicine, the conflicts in Iraq and Afghanistan have seen an unprecedented survival rate of 90%, a full 10 % higher than Operation Desert Storm in 1991. A side effect of this is that many more wounded warriors are returning with injuries that result in significantly impaired musculoskeletal structures and limb amputations. The military, as part of their overall commitment to support these brave heroes, has committed \$19.5 million dollars to optimize functional outcomes. A new consortium funded by the Department of Defense will take a multi-center, multi-study approach to ensure this goal is met.

The Bader (Bridging Advanced Developments to Enhance Rehabilitation) Consortium hub is at the University of Delaware and is comprised of the four military treatment facilities nationwide, as well as Harvard/Spaulding and the Mayo Clinic. The goal of this consortium is to establish evidence-based orthopaedic rehabilitation care that results in optimal functional outcomes for each wounded warrior. Along with Dr. Steven Stanhope, Director of the Consortium and Dr. Ken Kaufman, Director of the Scientific Cores, Dr. Irene Davis, Director of the Spaulding National Running Center will serve as the Director of Clinical Research. Dr. Davis will also lead one of the research initiatives focused on running. She will apply her research in the area of gait retraining to reduce faulty mechanics in soldiers with amputations in order to optimize performance and reduce injury risk.

Among the long term health benefits of restoring greater function to this often at-risk population will be the reduction of associated chronic conditions, such as pain and osteoarthritis. Reducing the number of chronic conditions with healthier and active lifestyles has vast impacts on the resources needed to support soldiers suffering from them and concurrently boosts the productivity of soldiers rejoining active duty ranks with unique skill sets and abilities.

"We owe it to these soldiers to ensure that we are helping them physically recover from the initial injury and equipping them with the tools to return to active duty and lead fulfilling lives," said Dr. Davis. "Growing partnerships with leaders in care like this consortium will help us build novel models of treatment for a military population, and eventually allow us to transfer these to the general population benefiting thousands of people for years to come." ■

Profile



Resident Profile Cheri Blauwet



THE PARALLELS between a marathon and rehabilitation medicine are numerous. Few physicians can understand both perspectives as innately as current resident Dr. Cheri Blauwet. Fewer still have known what it's like to be counted among the best athletes in the world.

Dr. Blauwet sustained a spinal cord injury in a farming accident as a young child. However, she was raised to be active and to see a disability as simply another way of living.

In high school, she found wheelchair racing and in college at the University of Arizona, she became the captain of the wheelchair track and road racing team. Soon, she shined on the world stage winning gold, silver and five bronze medals at the 2000 and 2004 Paralympic Games.

Among her greatest triumphs, she won the Boston Marathon twice. Soon the accolades followed, with nominations for

From a racing champion to a residency in PM&R

an ESPY award and Laureus World Sport Award. Despite all of her success, the well grounded Dr. Blauwet feels it's her responsibility to ensure opportunities for the next generation of athletes.

Dr. Blauwet is one of just seven physicians worldwide serving on the International Paralympic Medical Council. The council is responsible for setting policy and regulation around the health and well-being of paralympic athletes.

This role has allowed her to bring the two passions of her life together to benefit both her own clinical experience and create a better system for athletes.

It's fitting that Dr. Blauwet learns her craft in the same city that saw some of her greatest athletic triumphs. With her unique blend of skill, energy and advocacy, it's evident to all that she will help those she treats reach their greatest triumphs for years to come. ■



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In Pictures



Shaq visits Spaulding

Celtics Center Shaquille O'Neal made a surprise visit to the Spaulding North End Nursing and Therapy Center visiting with about 30 patients ranging in age from 13 to 102. ■



Run to Home Base at Fenway

Senator Scott Brown and Dr. Ross Zafonte were at the Mass General/Red Sox Foundation Run to Home Base. Over 2500 runners raised over \$2.5 million for care and research programs. ■



Boston Marathon

Several residents from the Department volunteered to work various medical tents along the 26 mile route. Governor Deval Patrick posed with Dr. Stephen Esser, Dr. Michael Sein and Dr. Michael Rizkalla. ■

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