Welcome to the first edition of Orthopedics and Rehabilitation In Review, a newsletter from the University of Wisconsin School of Medicine and Public Health Department of Orthopedics and Rehabilitation.

This newsletter describes innovative research and new clinical treatment options that are occurring at the University of Wisconsin in the field of orthopedics and rehabilitation. It is important to our faculty and staff to let you know what we’ve been learning, teaching and practicing. We hope you find this newsletter to be a valuable and informative resource.

But even more importantly, we want to connect with you. Our deep commitment to the Wisconsin Idea means that we touch lives across the state and beyond.

So, as you care for your patients, we invite you to stay in contact with us. Visit us online at uwhealth.org/ortho. We also encourage you to contact the OrthoAccess triage service at uwhealth.org/orthoaccess, (888) 978-4611 or by e-mail at orthoaccess@uwhealth.org.

Best to you in the new year.

Tom Zdeblick, MD
Professor and Chairman
Department of Orthopedics and Rehabilitation

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Everything’s coming up bone, cartilage, tendons and ligaments in the lab of Wan-Ju Li, PhD. Dr. Li, an assistant professor of orthopedic surgery and biomedical engineering, uses electrospinning—a technology developed in 1934 for weaving fiber into textiles—to create intricate scaffolds that mimic human collagen. He then cultures adult stem cells in those scaffolds so they can grow into mature, functional tissue. The goal? Some day, these custom-engineered tissues could be implanted into injured and arthritic joints, helping patients lead healthier, pain-free lives.

Hybrid Research Focuses on Cells and Their Environment

Dr. Li came to the University of Wisconsin School of Medicine and Public Health almost three years ago, after completing a postdoctoral fellowship at the National Institutes of Health. He currently leads the Laboratory of Musculoskeletal Biology and Regenerative Medicine at the UW School of Medicine and Public Health. Since the lab’s creation in September 2008, Dr. Li has recruited 12 postdoctoral fellows, graduate students and undergraduate students to work on orthopedic regenerative medicine research.

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Welcome New Physicians

DAVID GOODSPEED, MD
Orthopedic Trauma

Dr. Goodspeed is board certified in orthopedic surgery. He earned his medical degree from the University of Wisconsin School of Medicine and Public Health and completed his orthopedic residency at University of Wisconsin Hospital and Clinics. He completed his orthopedic trauma fellowship at Methodist Hospital, Indianapolis. Prior to joining the department, Dr. Goodspeed spent 10 years in the Department of Orthopaedics and Rehabilitation at Pennsylvania State University/Milton S. Hershey Medical Center.

KEVIN MACDONALD, MD
Joint Replacement/Orthopedic Oncology

Dr. MacDonald earned his medical degree from the University of Wisconsin School of Medicine and Public Health and completed his orthopedic residency at University of Wisconsin Hospital and Clinics. He completed his musculoskeletal oncology fellowship at the University of Washington Medical Center and Seattle Children’s Hospital. He has advanced training in the care of adults and children with benign and malignant tumors involving the musculoskeletal system. He also specializes in adult reconstructive procedures such as total joint arthroplasty. His research interests include development of more durable arthroplasty fixation for limb salvage procedures and molecular modeling of chondrosarcoma proliferation.

TAMARA A. SCERPPELLA, MD
Sports Medicine

Dr. Scerpella is board certified in orthopedic surgery. She earned her medical degree from the University of Iowa, Iowa City and completed her orthopedic residency at University of Wisconsin Hospital and Clinics. She completed her sports medicine and arthroscopic surgery fellowship at Union Memorial Hospital, Baltimore. Dr. Scerpella’s research interests include bone mineral accrual during childhood, bone mineral density, tibia stress fractures, medial tibia stress syndrome and functional outcome of arthroscopic rotator cuff repair. Prior to joining the department, Dr. Scerpella spent 15 years at SUNY Upstate Medical University, Syracuse where she was head of the sports medicine division.

TOMMY YU, MD
Rehabilitation

Dr. Yu earned his medical degree from Rosalind Franklin University of Medicine and Science, Chicago and completed his internship at Advocate Lutheran General Hospital, Park Ridge. He completed his residency at Shrew Rehabilitation Hospital/University of Chicago. Dr. Yu specializes in general rehabilitation and spinal cord injury.

Brace Yourself: Are Ankle Braces Effective at Preventing Injuries?

Quick. What’s the most common injury among high school football players? No, it’s not a concussion. It’s actually an ankle sprain. The 1.1 million teens who play high school football in the United States suffer more than 81,000 ankle sprains each year. Football-related ankle sprains account for 25 percent of those injuries. That’s of great concern to players, parents and coaches, none of whom want to see their athletes walking around on crutches, missing playing time.

In a first-of-its-kind study, Tim McGuine, PhD, LAT, UW Health Sports Medicine researcher and athletic trainer, and Alison Brooks, MD, MPH, assistant professor of sports medicine at University of Wisconsin School of Medicine and Public Health, will examine whether using ankle braces during football practice and games will help to reduce the incidence of ankle sprains. The study that began in August 2010, involves 50 high schools from across Wisconsin, and more than 2,000 football players. The braced group was given stabilizing, lace-up ankle braces to wear in practices and games. The control group practiced and played as they normally would, with some athletes wearing braces and some not. Brooks and McGuine will compare the number and severity of ankle sprains between the groups.

“This is the largest-scale study of this type that’s ever been attempted,” says McGuine, who notes that he and his colleagues recruited athlete participants from a diverse mix of urban and rural settings, as well as public and private schools. “Whether they’re playing football in Milwaukee, Hudson, Janesville or Phillips, the benefit to high school athletes could be huge.” Especially if the study results provide new strategies for preventing ankle sprains, an injury that is notoriously cumulative.

“If a football player hurts his ankle once, the risk of future injury is much higher,” says McGuine. “Some studies place the chance of a second sprain at 70 percent. And a lot of these athletes go on to have serious osteoarthritis issues as adults.”

The study is funded by the University of Wisconsin Department of Orthopedics and Rehabilitation Research Fund.

A similar study was conducted using ankle braces for basketball players. The results will be completed in April 2011. If you would like a copy of the results, please complete the form at uwhealth.org/anklestudy.
Brittany Mabis was in eighth grade when she was diagnosed with bone cancer. Her tumor was the size of a grapefruit and doctors told her she may have to have her leg amputated or follow-up—the UW Health team works closely with primary care physicians to ensure patients receive most of their care from their primary care physician. But when specialty care is needed—for diagnosis, treatment or follow-up—the UW Health team works closely with primary care physicians to develop individualized plans.

“With education in both biomedical engineering and cell biology, Dr. Li is a ‘hybrid’ scientist whose cutting-edge work approaches tissue engineering from both the cellular and the biomaterial perspectives. For example, one arm of his research aims to optimize the process for growing tissue from stem cells: the ‘holy grail’ of tissue engineering. He has already shown this method works in pig bone and cartilage, and he is collaborating with researchers at the UW School of Veterinary Medicine to test how engineered cartilage, tendon and intervertebral discs function in a sheep model.

But Dr. Li is also studying how scaffold structure affects cell activity, including how the scaffold’s microstructural features, such as dimension, affect the cellular response; which cell receptors and signaling pathways are activated; and which genes turn on in response to the new environment. He has cultured stem cells in both two-dimensional and three-dimensional scaffolds, and then extracted the cells and globally profiled 38,500 genes in microarrays to learn which genes are turned on and off in the two-dimensional and three-dimensional groups. Dr. Li’s research has generated three patients and produced nearly 30 publications, including one cited more than 630 times in eight years.

Collaboration Thrives at WIMR

Dr. Li’s lab is based at the Wisconsin Institutes for Medical Research (WIMR), a multidisciplinary center that brings together basic and clinical research talent to tackle medicine’s most important questions. The collaborative environment at WIMR is essential for Dr. Li’s research. He needs to work closely with cell biologists, engineers and transplant and orthopedic surgeons to quickly get their unique perspectives and then get his lab findings to people who need it.

The WIMR facility eliminates laboratory walls, places office areas close to labs, allows rapid sharing of complex equipment and facilities, and includes interactive space on every floor. Dr. Li says WIMR is one reason he wanted to come to Wisconsin. “The collaboration is already happening for my lab. When I need bone marrow (from which to isolate adult stem cells), I can just talk to my colleagues next door.”

The Wisconsin Institutes for Medical Research (WIMR) at the University of Wisconsin School of Medicine and Public Health is designed to allow researchers to work with scientists from other disciplines, speeding the transfer of science to the people who will benefit from it.

Here’s what’s inside the Wisconsin Institutes for Medical Research:

- Orthopedic and regenerative medicine and surgery researchers
- The University of Wisconsin Carbone Cancer Center (UWCCC) researchers
- Laboratory resources and facilities
- World-class programs in imaging and radiation sciences
- University of Wisconsin Hospital and Clinics outpatient radiotherapy unit
- Medical physics department

FOR MORE INFORMATION...

- Visit orthorehab.wisc.edu/ortho/research/wanjulilab/
- University of Wisconsin Hospital and Clinics' outpatient radiotherapy unit
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Robotically Assisted Partial Knee Replacement

Robotic arm technology now allows UW Health orthopedic surgeons to perform partial knee replacements more accurately and less invasively than ever before.

UW Health is one of only a handful of programs in the state to offer Mako Surgical Corp.’s RIO® Robotic Arm Interactive Orthopedic System for partial knee replacement. A team of joint replacement surgeons is overseeing its introduction.

The goal is to offer younger, active patients with knee osteoarthritis the best possible long-term function.

Precise Navigation and Execution

The RIO system combines precise navigation with robotic-arm assisted execution. First, three-dimensional anatomical data from a CT scan is fed into the RIO system. The surgeon then uses the data to accurately register the pins for the implant. Surgeons use the data to plan the operation by performing “virtual surgery” before any incisions are even made.

Robotic Arm

These same data guide RIO’s burr-tipped robotic arm during the actual surgery. The surgeon uses the burr to shape the patient’s bone before placing the implants, following a predefined “envelope” of three-dimensional space. Because the burr will only operate in the appropriate space, there is no chance of an instrument slipping and injuring adjacent tissues.

Because the procedure can be performed with smaller incisions than standard manual procedures, patients may experience a quicker recovery with less pain. The system also enables precision in implant positioning, which may result in better long-term function.

UW Health orthopedic surgeons who provide Makoplasty include: Drs. John Heiner; Richard Itjen, III; Richard Lemon; William Mott and Matthew Squire.

OrthoAccess: Matching Specialists to Patient Needs

OrthoAccess is a service for physicians who refer patients to any UW Health orthopedics and rehabilitation medicine clinic or provider. By calling or e-mailing, referring providers can access orthopedic nurses who can offer specific recommendations for patient referrals based on the needs of the patient.

The OrthoAccess nursing staff is led by Susan Woodman, RN. “We frequently receive calls from regional clinics about a variety of patient concerns,” Woodman says. “It’s often a question of which provider is most appropriate. For example, an active patient with arthritis who hurts his knee might need a sports medicine consultant, or he might need joint replacement surgery. We help providers figure it out.”

The service covers all UW Health orthopedic and rehabilitation medicine clinics and operates Monday through Friday from 8 am–4:30 pm. When a call or e-mail request comes in, OrthoAccess staff collect patient information, including any available imaging or lab results. Based on that information they direct the patient to the most appropriate provider. While the service works to facilitate requests quickly, it is meant for non-emergency, ambulatory cases only.

Providers should still seek out a hospital emergency room or immediate care center for emergency cases. But for non-emergency situations, OrthoAccess staff can assist patients and providers.
34th Annual University of Wisconsin Sports Medicine Symposium

APRIL 7 & 8, 2011 • MADISON MARRIOTT WEST, MADISON, WI

Join the faculty of the University of Wisconsin Department of Orthopedics and Rehabilitation for the 34th Annual Sports Medicine Symposium.

This Symposium provides the latest information on the prevention, recognition and treatment of athletic injuries. The conference’s focus is on practical and clinically relevant information for health care providers to use in their daily practice.

Some of the topics include:

Thursday, April 7
• Return to Play Cases and Decisions
• Head Injury Update
• Hot Topics in Sports Medicine

Friday, April 8
• Hip Mini-Symposium
• Orthopedic Case Presentations and Pearls

For full schedule and registration information, e-mail ammeyer@ocpd.wisc.edu.

This activity has been approved for AMA PRA Category 1 credit. Conference fee includes course materials, CEU documentation, refreshment breaks, lunch, continental breakfast and registration.

James A. Goulet, MD
Professor, Orthopaedic Surgery
Chief, Orthopaedic Trauma, University of Michigan

For more information contact (608) 263-0888 or richardson@ortho.wisc.edu.