Cartilage Restoration and Joint Preservation Program helps the right patients avoid knee replacement

Knee replacement is common, but it may not be the right answer for active people age 50 and under, and it’s certainly not the right answer for teens with osteochondritis dissecans (OCD). Orthopaedic Surgery Department faculty members Jeffrey Macalena, MD, and Brad Nelson, MD, are convinced there is a better path for these patients, and the U’s two-year-old Cartilage Restoration and Joint Preservation Program is where that path starts.

The program begins with focusing on the individual. “Cartilage repair or meniscus tear for one person isn’t the same as it might be for another,” Macalena noted. “We aim to learn about what our patients want and value, and work with them to see how we can accomplish their goals.”

Nelson agrees, adding, “We’re trying to take a more multifaceted approach to these patients that includes surgical and non-surgical options, ortho-biologic treatment, and then rehabilitation.” Step one with these cases often begins with exploratory arthroscopy, “to help us understand what’s really going on in the knee,” Macalena explained. “When we’ve identified a good candidate, we have many options available.”

Patients in the Cartilage Restoration and Joint Preservation Program are actively followed by the Orthopaedic Surgery Department. “I’m not saying that every patient is a research subject,” Nelson noted, “but we do follow them to make sure the technology is effective.” He added that, so far, many patients have successfully avoided joint replacements as a result of their treatment.

The results have been particularly effective for teens with OCD. “This disease causes young patients to lose bone and cartilage,” Nelson said. “It can be a life-limiting problem. By restoring cartilage and bone using these technologies, we’re able to get young people back into recreational activities or off to college.”

Because these are newer treatments, some physical therapists may not have run into patients who have had them before. Working with department colleague, David Jewison, MD, the program has educated local therapists about Cartilage Restoration and Joint Preservation Program patients’ special rehab needs. “We have to protect the joint at first,” Nelson said. “The rehab tends to take a little longer, be more intensive, and is individualized based on the location and type of treatment.”

One of the exciting new directions for the program is stem cell therapy. “We are just beginning to explore injecting stem cells or other factors in a joint that can slow down the rate of cartilage loss or help rebuild it,” noted Nelson.
Letter from the Chair, continued

They are totally committed to understanding the cause of shoulder pain, patient by patient, and then custom designing various combinations of physical therapy, ergonomics and/or surgery. If any team can figure it out, this multidisciplinary team is the one!

Education and leadership are core priorities of our multi-pronged mission. I hope you find the description of resident, Matt Herring, MD, inspirational and energizing as we strive to graduate the best, brightest, and most committed orthopaedic surgeons and leaders. The term “servant leader” applies to no person more than Jeff Brand, MD, Orthopaedic class of 1989. Jeff graduated from the University of Minnesota undergrad in 1980, the University of Minnesota medical school in 1984, and completed his orthopaedic residency in 1989. As a “Tri-Gopher,” Brand personifies the value of how our land grant university contributes so broadly across the Land of 10,000 lakes.

Enjoy this issue. Thank you for your support, and please contact me with any questions, suggestions, or comments.

Denis R. Clohisy, MD
Professor and Chairman
Roby C Thompson Endowed Professor
Associate Dean of Surgical Specialties

Cartilage Restoration and Joint Preservation, continued from page 1

Department Chair Denis Clohisy, MD, is the driving force behind this vision. “He wants to develop a closer working relationship with the Stem Cell Institute here on campus,” Nelson added.

At the end of the day, “our goal is to have a program that’s academically focused and patient centric, with a service level that makes our patients feel comfortable traveling to the Twin Cities for their care,” Nelson said. “And when they return home, they have what they need to recover.”

Some of the Cartilage Restoration and Joint Preservation Program treatments being used by Nelson and Macalena include:

- **Performing meniscus transplants or osteochondral allografts:** This involves taking articular cartilage and/or bone from a donor and transplanting it into a patient’s knee to restore the damaged articular cartilage surface.

- **Using PRP (platelet-rich plasma) injections:** “We take blood from the patient, suspend it in a centrifuge to remove the red and white blood cells, and concentrate the growth and healing factors,” Macalena explained. “The plasma is then injected back into the patient’s injury site.” It’s an exploratory treatment that “certainly shows a lot of promise, although more research should be done,” he added.

- **Harvesting a patient’s cartilage cells:** Cells are harvested from the knee in a first-stage surgery, then grown in a membrane that is then re-implanted back in the knee. “We tested this treatment as part of a multi-site Phase 3 clinical trial that just wrapped up,” Nelson noted. “We’re hoping the technology gets FDA approval in the next year.”

- **Performing osteotomies:** “When certain patients have worn out their cartilage, we can’t just put new cartilage in or they will wear that out as well,” said Macalena. “We have to surgically change the alignment of the leg to create the best possible environment for the new cartilage.”

![Large cartilage defect on left, transplanted cartilage filling defect on right](image1)

![Large cartilage defect on left, membrane with patient cells filling defect on right](image2)
Despite the fact that 50 percent of medical students are female, only six percent of practicing orthopaedic surgeons are female, according to the American Academy of Orthopaedic Surgeons. To combat the gender disparities that exist in the field, the University of Minnesota and TRIA partnered to host the Perry Initiative.

The Perry Initiative, a nonprofit organization aimed at recruiting young women to orthopaedics, conducts hands-on programs across the country designed to inspire women in high school, college, and medical school.

The program was held at TRIA’s Woodbury clinic in November, 2017. On Friday evening, female medical students gathered to meet with local orthopaedic surgeons and discuss the career choice of orthopaedic surgery. In addition to the discussion and the time to rub elbows with female orthopaedic surgeons, the medical students also spent hands-on time performing simulated surgery of the spine, the femur, and the knee.

On Saturday, the program hosted 32 female students from Twin Cities high schools. They spent the day working alongside engineers and orthopaedic surgeons to spark passion and interest in both of these fields, which are predominantly male.

Students in the program practiced suturing a laceration, performed a spinal fusion to correct scoliosis, learned two ways to repair a broken bone, and reconstructed four ligaments on a model knee joint. At the end of the day, there was an opportunity for the young women to ask the professionals about college, and what inspired them most about their work.

The University of Minnesota Department of Orthopaedic Surgery has a proud legacy of promoting women in academics, research, and clinical practice. Today, 25 percent of the faculty in the Department of Orthopaedic Surgery at the University of Minnesota are women.

Additionally, the department has excelled in promoting diversity in its residency program. According to Ann Van Heest, MD, the residency program director over the last 15 years, nationally 14 percent of orthopaedic surgery residents are female, while our department has trained over 25 percent females for the last ten years.

“Our orthopaedic department has a true passion and support for leading the advancement of female orthopaedic surgeons in this country,” Van Heest added.
Braman attended a 12-week grant writing course on campus to enable him to help the team with the process. "You're not an expert until you've been funded several times," he said. "But I understand the process better now."

Throughout the course, Braman had to defend his grant. "I was forced to re-digest it every week," he said. "I was also exposed to other grants from departments throughout the Medical School. Our grant was informed by the process of exploring those grants."

Funding is a constant challenge for research teams like this one. "We're always chasing dollars," Ludewig noted. "And while I love working with the trainees, they tend to leave us just as they're becoming most productive."

Despite these challenges, the team is convinced their work will be transformative. "For people who pay the rent with their shoulders – pitchers, tennis players, even orthopaedic surgeons – there is a lot of opportunity to keep them in the game, in the workforce, and sleeping through the night because they're pain-free," Braman said.
When Chief Resident Matthew Herring, MD, sees something that needs doing, his response is simple, he does it. His ability to get things done inspired Residency Program Director Ann Van Heest, MD, and Department Chair Dennis Clohisy, MD, to “overwhelmingly support” Herring for the UMMC Medical Executive Committee Award for Resident/Fellow Contribution to Quality Improvement. In their nomination, Van Heest and Clohisy described several instances in which Herring demonstrated his “commitment to quality improvement in many small, and in many significant, ways.”

During his third year as a resident, for example, Herring had a rotation at the Minneapolis Veterans Affairs Medical Center (VAMC). At the time, the Orthopaedic Surgery Department had taken over as primary providers for VA patients needing diabetes-related amputations. “I noticed that these patients were coming to us with differing levels of workup and at different levels of optimization,” Herring said. “I thought it would be prudent to do something about it.”

**Overcoming obstacles**
Diabetic patients require special handling. “If diabetes isn’t well controlled, it can wreak havoc on the cardiovascular system, especially the medium-sized blood vessels in the lower extremities,” Herring explained. “The vessels become damaged and less able to supply enough blood.” That affects the diabetic patient’s ability to heal, making them more susceptible to infection. Herring’s objective was to ensure that these patients had a successful surgery and a recovery without complications. “I learned that if you have a clearly defined goal, it’s all you need to get something like this started,” he noted. “People will begin getting in your boat, helping you understand how to get it done.”

Partnering with V. Franklin Sechriest II, MD, and fellow residents at the VAMC, Herring researched and designed a multidisciplinary protocol for diabetic amputation patients’ preoperative workup and postoperative care. It was incorporated into the VAMC’s electronic medical record system and is currently the standard of care for these patients.

**Establishing process**
Not content to rest on his laurels, Herring took on another challenge in his fourth year as a resident. He observed some treatment inconsistencies for patients coming in with diabetic foot infections. According to the award nomination, Herring created a template for a protocol that standardized the workup and care for these patients.

“I used a lot of what I learned at the VA and created a consultation note inside EPIC that auto-populates everything that should be done to optimize care,” he said. One of the challenges he faced was figuring out how to get buy-in for an approach that everyone would have to use. In addition to running it by department heads, clinic staff, and people who oversee EPIC, “I used my grand rounds presentation to introduce it and reviewed the evidence supporting everything I proposed,” Herring said.

“I learned that if you have a clearly defined goal, it’s all you need to get something like this started.”
— Matthew Herring, MD

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Award winning resident, continued from page 5

The template is now widely used to guide the initial evaluation and workup of diabetic foot consultations at the University of Minnesota Medical Center.

Herring also developed a resident-led campaign to reinvigorate the fourth year of residency by stimulating a change in the workplace culture. In that capacity, he helped improve the PGY-4 call schedule, resolving coverage issues. He also helped foster better communication. The University can seem fairly siloed and our best tool to overcome this was communication – almost over communication,” he explained. “As a class, we touched base regularly with one another, primarily through email and during morning conferences. I also tried to reach out to everyone frequently at all levels of patient care to ensure we [the residents] were helping deliver the best care possible.”

During his fifth (and current year), Herring represented the Orthopaedic Surgery Department during the AOA Resident Leadership Forum and helped make reporting duty hours for residents easier and more efficient. Finally, he led an effort to create a new fifth-year rotation, called the Career Rotation. During this rotation, residents learn leadership skills by working closely with the department chair, as well as having to complete a leadership project by the rotation’s end. Van Heest and Clohisy noted that this was, “a pioneering step in orthopaedic education towards teaching practice management and leadership skills in residency.”

It almost goes without saying that Herring won the award.

Alumni named Assistant Editor-in-Chief of respected orthopaedic surgery journal

U of M Orthopaedic Surgery alumni, Jeff Brand, MD, practices sports medicine and arthroscopy at top-rated Douglas County Hospital in Alexandria, MN. Brand is involved in many aspects of orthopaedic service, including being a team physician for area high schools and the University of Minnesota–Morris (UMM). In fact, he was recently inducted into the UMM Hall of Fame. And he is the co-chair for the 2018 Minnesota Orthopaedic Society Annual Meeting.

Brand was also recently named Assistant Editor-in-Chief of the journal, Arthroscopy. “It’s a little unusual to be in private practice and serve in that capacity,” he said. Brand had been a member of the journal’s editing staff since 2010.

In making the announcement, Editor-in-Chief James Lubowitz, MD, said Brand “has made many valuable contributions during his years of service to Arthroscopy, including supervising the selection of Journal Prize winners each year, and in providing statistical analyses that have helped make our review process more comprehensive.”

Lubowitz also noted that Brand has authored numerous articles, reviewed for other journals, and served as a lab instructor at the Orthopaedic Learning Center. Reacting to the elevation in his editing position, Brand wrote, “I consider my work at the Arthroscopy Journal to be among the most meaningful, rewarding, and gratifying work I have done in my life.”

Helping move the practice of arthroscopic surgery forward through his work with the journal comes naturally to Brand. “I like getting as close as I can to figuring out the answers to important questions,” he said. “Research is a way to do that. It gives you a means for looking at things from many levels.” Brand feels it’s important to continue doing research while in private practice. He built his foundation in the scientific process first at the U of M and then during a Sports Medicine Fellowship at the University of Kentucky in Louisville. “It’s more challenging to do research now because I don’t have access to the same kinds of facilities,” he said. “You just learn to be more flexible.”

In addition to having a research director at his current hospital, Brand’s daughter, Emily Monroe, MD, plans to join the staff at Douglas County after she completes a Sports Medicine Fellowship at the University of California, San Francisco. “That will certainly help us continue our work,” he said.

From his practice, to his work with local sports teams, to his research and work with Arthroscopy, we can echo and appreciate Lubowitz’s ending for his announcement about Brand’s new role: “I look forward to Jeff’s continuing efforts to make our journal even better.”
Need help right away with a musculoskeletal problem? Come to the Sports and Orthopaedic Walk-In Clinic.

Suppose your daughter trips and falls during basketball practice on Saturday morning, hurting her wrist. Or you fall on the ice as you’re walking to the car Sunday morning. Or you’ve been struggling with a sore shoulder and just can’t seem to fit an appointment in. What are you going to do?

Head over to the Sports and Orthopaedic Walk-In Clinic located in the Clinics and Surgery Center on the U of M campus. “We have two highly trained Sports Medicine physicians – Dr. David Supik and Dr. Sean Engel – who are able to meet everyone at their own sidelines, so to speak,” said Walk-In Clinic Director David Jewison, MD. “Whatever medical problem comes up, we’re right there to help manage it.”

Open from 7 a.m. to 7 p.m. every day, Walk-In Clinic staff can provide non-surgical treatments as soon as they’re needed, including splinting, injections, and other therapies. Since opening its doors in September, 2017, over 4,000 patients have chosen the convenience and superior care the Walk-In clinic provides.

Additionally, patients from school-age to adult have access to same-day x-ray and MRI imaging. If surgery is needed, “we help figure everything out and expedite any referrals,” Jewison noted. “You don’t have to worry about being sent two places before seeing a specialist.”

Efficiency and quality care are watchwords of the Walk-In Clinic. “What I’m most proud of is that we have sports medicine-trained physicians working in our clinic,” Jewison noted. “That’s different than your typical urgent care center.”

Sports and Orthopaedic Walk-In Clinic location and phone number: Clinics and Surgery Center, 909 Fulton St. SE, Minneapolis, MN, 55455; 612-676-5535.

“What I’m most proud of is that we have sports medicine-trained physicians working in our clinic.”

— David Jewison, MD, Walk-In Clinic Director

The Walk-In Clinic opened its doors in September, 2017
New Hires

**Anne Hopper**, Clinical Research Manager

**Chad Myeroff, MD**, Trauma

** Brianna Vitands**, Communications Specialist

If you are interested in making a gift of any size to the Department of Orthopaedic Surgery, please visit www.giving.umn.edu/giveto/ortho. Questions? Call Jean Gorell at (612) 625-0497 or Kathy Wegner at (612) 624-9107.

Awards and Achievements

**Jonathan Braman, MD**: Received the ABC traveling fellowship from the American Orthopaedic Association. During the five week fellowship, recipients visited orthopaedic centers around the globe to attend lectures, present findings, and complete clinical observations.

**Jeff Brand, MD**: Honored in the UMM Hall of Fame and will be inducted on September 21, 2018. He is also serving as co-chair for the Minnesota Orthopaedic Society annual meeting.

**Michael Chau, MD**: Recipient of the OREF Resident Clinician Scientist Training Grant for his project regarding micro-environmental influences on articular chondrocyte differentiation.

**Cathy Carlson, DVM, PhD, DACVP**: Appointed as Chair of the Department of Veterinary Clinical Sciences.

**Mark Dahl, MD**: Published the book “Intramedullary Limb Lengthening, Principles and Practice,” with co-author Stuart Green.

**Alicia Harrison, MD**: Received the Dean’s Tribute to Excellence in Education Award, which recognizes contributions to medical education, innovation, and research.

**Matt Herring, MD**: Awarded the UMMC Medical Executive Committee Award for Resident/Fellow Contribution to Quality Improvement.

**Ryan Hoel, MD; Michael Knudsen, MD; Marcus Mittelsteadt, MD; Joseph Schirmers, MD; Benjamin Williams, MD**: Residents had abstract papers accepted for presentation at the 2018 AAOS Annual Meeting.

**David Polly Jr., MD**: Recipient of the University of Minnesota’s Clinical Research and Innovation Award as well as the University of Minnesota Medical Staff Award for excellence in clinical care, research, innovation, and education.

**Marc Tompkins, MD**: Became Country Director of Health Volunteers Overseas, and was featured in a TED Talk regarding how augmented reality could change the future of surgery.