Maya Oberstein was diagnosed with osteosarcoma of the distal femur in 2012, at age 9. After she completed chemotherapy, Maya’s treatment options were an above-knee amputation, limb salvage with an internal prosthesis or a more unconventional approach: rotationplasty. Carol Morris, chief of Johns Hopkins’ Orthopaedic Oncology Division, is one of a select group of surgeons in the United States who perform this alternative reconstructive procedure. Morris counseled Maya and her family on the available options. “She was the first doctor who asked me how I was feeling,” says Maya, “how I was doing.”

Developed in 1930 to treat femoral deficiency in a patient with tuberculosis, rotationplasty today may be indicated for lower-extremity bone sarcoma. The procedure involves resecting the knee while retaining the femoral artery and sciatic nerve. The distal segment is rotated 180 degrees and reattached to the proximal segment, converting the reversed ankle joint into a functional knee joint. The foot acts as a tibia, fitting into a modified transtibial prosthesis.

Rotationplasty presents unique challenges that Morris considers when preparing for the procedure. In younger patients, she says, “you have to calculate how much growth they have left in the foot and in the ankle of that side so when they’re done growing, the heel matches the level of the knee on the other side. Cosmetically, if you’re sitting, it’s nice if the knees are even.”

Morris recalls her initial reluctance about the procedure. “I thought it was a physically challenging thing to do to a child when prosthetics had made tremendous advancements,” she says. “As I gained more experience in the field, I began to appreciate the limitations of internal prostheses and the functionality rotationplasty could provide. For the right parents and the right child, under the right set of circumstances, rotationplasty is a good operation. It’s much more functional than an above-knee amputation.”

Traditional prostheses, especially growing prostheses, are more restrictive than the modified transtibial prosthesis, limiting a patient’s ability to participate not only in sports, but in typical activities such as running, dancing and jumping.

“It’s a great option for patients with cancer around the knee. It’s great for kids who want to be very athletic. It’s even great for adults who want to maintain a high level of function,” says Morris. Although there is concern that the cosmetic issue could affect quality of life, Morris says patients who choose rotationplasty “turn out to be some of my happiest patients.”

Maya Oberstein has adjusted well to the prosthesis. She is an active cyclist and gymnast, and she recently completed a 25-mile bicycle ride to raise money for cancer research.
Training in Orthopaedic Team Science

Thomas Clemens is no stranger to translational research. “I’ve spent my entire career in clinical departments working with physicians on translational research projects,” says the vice chair for research in the Johns Hopkins Department of Orthopaedic Surgery. “What struck me when I joined Hopkins was that the surgeons and residents were so busy, they simply had no time to collaborate with us on research projects. We may as well have been on different planets.” This separation, popularly known as the “bench-to-bedside gap,” severely impedes the translation of new discoveries into clinical practice.

Today, however, Clemens has a powerful new mechanism for closing the bench-to-bedside gap: a National Institutes of Health-sponsored training program called TOTS, short for Training in Orthopaedic Team Science.

Clemens believes that the key to developing meaningful translational research studies is to create multidisciplinary teams. “I took a page from what industry does,” he says. “They form big teams that comprise people from very different backgrounds. Here, we’re consolidating the entire program, bringing surgical faculty, residents and Ph.D. basic scientists together on projects.”

Because residents are key to its success, the TOTS program sponsors a dedicated research year for an orthopaedic resident to collaborate with clinical faculty and a basic science team to address an important question related to diagnosis or treatment of a musculoskeletal disorder.

The first TOTS-sponsored project joins faculty from several Johns Hopkins departments, including dermatology, orthopaedic surgery and radiology, to study infection in bone via a mouse model in which they can monitor the bacterial burden with fluorescent bacteria. The aim is to apply their research to treating infection after orthopaedic implant surgery, with the goal of avoiding costly revisions.

Clemens believes this project exemplifies how effective the team approach can be in developing translational research. “You can’t expect busy surgeons to make a genetically altered mouse or to work in a wet lab culturing cells. That’s our bailiwick,” he says. “Conversely, I wouldn’t know how to deliver biologic molecules during surgery, but I can learn the basics from my surgical colleagues. It’s all about teamwork: the surgeons to provide input on the most pressing clinical questions and the researchers to develop the methods to study them.

“The applied nature of orthopaedic science is ideal for translational approaches,” he continues. “The great diversity of problems that affect the musculoskeletal system provides unique opportunities for training in a wide range of fields, including basic cell biology, genetics, bioengineering, biomechanics, regenerative medicine and public health.” With the support of the T32 grant, the Hopkins Orthopaedic Department is poised to take a lead role in developing the next generation of therapies that will greatly benefit patients with disorders of the musculoskeletal system, such as osteoporosis and arthritis.

Ahead of the Curve: How Clinical Research Drives Pediatric Care

Paul Sponseller, director of the Division of Pediatric Orthopaedic Surgery at The Johns Hopkins Children’s Center, has been treating children at Hopkins for 30 years. His practice is a prime example of the Center’s mission to lead innovative research for the treatment of childhood diseases while providing continuity of care as children grow.

“What’s noteworthy about my practice,” says Sponseller, “is that we see many difficult syndromic, genetic, neuromuscular and idiopathic patients with severe deformities.”

Many families come to Johns Hopkins because of the specific expertise he offers. Payton Mueller, 15, for example, was diagnosed with spinal muscular atrophy (SMA) after his first birthday. At age 7, he and his mother, Rachele, traveled from their home in North Dakota to a Families of SMA conference. There they connected with Johns Hopkins pediatric neurologist Thomas Crawford, who recommended a thoraco-lumbar-sacral orthosis for Payton’s scoliosis. “Dr. Crawford was the one who told us about...”

“It’s important to know when not to, as well as when to operate,” says Paul Sponseller. “Sometimes the right decision is a brace, a cast or therapy. Judgment developed over many decades of seeing children grow up can often change the decision.”
**Never Finished: A Commitment to a Healthy Life**

Farid Srour believes that orthopaedic surgeon Edward McFarland might have saved his life. “He is the reason I’m here at Johns Hopkins,” says Srour. “Maybe that saved my life.”

Recently, Srour, who is in his 90s, experienced unbearable hip pain. He immediately thought to call McFarland, who had treated Srour’s shoulder in the past. Srour’s companion, Barbara Pantos, drove him to the Johns Hopkins Emergency Department. “It was a miracle that I told Barbara, let’s go to Hopkins. I want to see McFarland. And when we arrived, they found out what the trouble was. Had I not done that, I believe I would have died.”

Months earlier, Srour had fractured his hip, which was repaired at his local hospital. Now, he was experiencing excruciating pain. McFarland, director of the Division of Shoulder Surgery, told Srour to come to the hospital immediately. In the emergency department, radiographs showed a screw protruding from the bone into Srour’s pelvis, which was ultimately treated by Paul Khanuja, chief of adult reconstruction.

Pantos describes McFarland as “the lightning force that organized everything,” helping ensure the timely and exceptional care for which The Johns Hopkins Hospital is known.

A recent article in the journal BMJ Quality & Safety analyzed patient complaints about their health care experiences. It found that nearly 14% of complaints were related to “communication.” In Srour’s experience, a single, dedicated physician like McFarland can be the key to avoiding such problems. But even beyond McFarland and Khanuja, Pantos says, “we’ve had such wonderful experiences here. They really care for each individual patient, and they spend time listening. They’re experts in their field. This is the most magnificent place to be.”

Srour came to the U.S. alone in 1946 to enroll in college. After years working as a carpenter, ditch digger and taxi driver, he says, “I graduated from taxi driving to real estate somehow.” He bought his first small property in Wheaton, Maryland, and then another. Soon he was involved in commercial development and continues working to this day, even as his four children, three of whom are physicians, are retiring.

His oldest son graduated from the Johns Hopkins School of Medicine and introduced Srour to his teachers, who gradually became Srour’s doctors. “My son found McFarland, and that was a lucky break. He is a wonderful man,” Srour says. When he first saw McFarland with shoulder pain that Srour’s local doctor said would require surgery, McFarland recommended nonoperative treatment, which ultimately healed the shoulder. That experience instilled in Srour deep confidence in McFarland’s clinical judgment.

A self-described wrestler and someone who ran before there were running shoes (“I used to run in my dress shoes. And in the woods.”), Srour recalls people teasing him about his commitment to physical activity. But he’s not done yet. “I want to leave a path,” says Srour of his donations to support The Johns Hopkins Hospital. “I’m still not finished, so you never know…”

**Supporting Our Work**

The Johns Hopkins Department of Orthopaedic Surgery provides outstanding treatment of musculoskeletal disorders, fosters innovation and nurtures the next generation of orthopaedic surgeons. Our physician-scientists are leading the nation with groundbreaking research and innovations in patient care.

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**The Dega Osteotomy/Acetabuloplasty**

The Dega osteotomy as originally described provides anterior and lateral coverage for patients with developmental dysplasia of the hip by preserving the inner table of the pelvis posterior to the iliopectineal line and the entire cortex of the sciatic notch. The operation, however, can also be modified to provide posterior coverage if needed.

**Watch Paul Sponseller demonstrate how the osteotomy can be performed to provide enough stability that a spica cast is not needed postoperatively:** [https://bit.ly/SponsellerDegaOsteotomy](https://bit.ly/SponsellerDegaOsteotomy)
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In the late 1800s, a Baltimore investor changed the course of history with one bold stroke of his pen by signing a bequest that would create The Johns Hopkins Hospital and inspire a revolution in American medicine.

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Framework

This newsletter is one of the many ways we seek to enhance our partnership with our thousands of friends and patients. Comments, questions and topics you would like to see covered in upcoming issues are always welcome.

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1 Rotationplasty Offers Greater Functionality for Patients with Cancer
2 Training in Orthopaedic Team Science
3 Never Finished: A Commitment to a Healthy Life

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