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The Oregon Journal
of Orthopaedics

Volume VIII May 2019



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1. Mayman DJ, Patel AR, Carroll KM. Hospital Related Clinical and Economic Outcomes of a Bicruciate Knee System in Total Knee Arthroplasty Patients. Poster presented at: ISPOR Symposium; May 19-23, 2018; Baltimore, Maryland, USA.
2. Nodzo SR, Carroll KM, Mayman DJ. The Bicruciate Substituting Knee Design and Initial Experience. Tech Orthop. 2018;33:37-41. 3. Takubo A, Ryu K, Iriuchishima T, Tokuhashi Y. Comparison of muscle recovery following bicruciate substituting versus posterior stabilized total knee arthroplasty in an Asian population. J Knee Surg. 2017;30:725-729. 4. Kosse NM, Heesterbeek PJC, Defoort KC, Wymenga AB, van Hellemond GG. Minor adaptations in implant design bicruciate-substituted total knee system improve maximal flexion. Poster presented at: 2nd World Arthroplasty Congress; 19-21 April, 2018; Rome, Italy. 5. Kaneko T, Kono N, Mochizuki Y, Hada M, Toyoda S, Musha Y. Bi-cruciate substituting total knee arthroplasty improved medio-lateral instability in mid-flexion range. J Orthop. 2017;14(1):201-206. 6. Grieco TF, Sharma A, Dessinger GM, Cates HE, Komistek RD. In Vivo Kinematic Comparison of a Bicruciate Stabilized Total Knee Arthroplasty and the Normal Knee Using Fluoroscopy. J Arthroplasty. 2018;33(2):565-571. 7. Iriuchishima T, Ryu K. A comparison of Rollback Ratio between Bicruciate Substituting Total Knee Arthroplasty and Oxford Unicompartmental Knee Arthroplasty. J Knee Surg. 2018;31(6):568-572.

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Letter from the Editors

Welcome to the eighth volume of *The Oregon Journal of Orthopaedics*. We want to thank our faculty, residents, alumni and all of our supporters for their contributions.

In this edition we chose to highlight advancements within the field of orthopaedics, with regards to patient care, research and outreach, that is taking place throughout a multitude of orthopaedic practices in Portland. We look at the changes being made in inpatient and post-operative patient care by Dr. Lucas Anissian and team at the Portland VA. We then look at the research advances and contributions to orthopaedics by Dr. Paul Duwelius at St. Vincents. Finally, we focus on the tireless efforts of Dr. Richard Gellman with regards to international work and the experience of Dr. Grant Sun, a 4th year orthopaedic resident at OHSU this past year.

OHSU is also privileged to welcome two new faculty to the department of Orthopaedics & Rehabilitation. We will introduce Dr. Ryan Kagan, a former resident at OHSU who specializes in total joint arthroplasty, and Dr. Zachary Working who specializes in orthopaedic traumatology.

In the research field, we have a selection of abstracts that highlight current projects taking place at our institution and throughout the community. We also highlight the senior projects completed by the residents at OHSU and Samaritan Health Services.

Faculty Editor: Darin Friess, MD

Senior Editors: Trevor Barronian, MD and Jason Laurita, MD

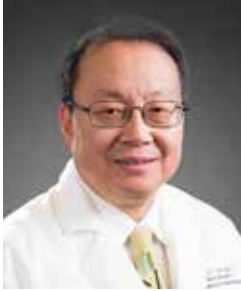
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Editors Emeriti: Peters Otlans, MD, Elizabeth Lieberman, MD, Nikolas Baksh, MD and David Putnam MD

Cover Art

Photographer: Christine Bailey Speed Photography; Subject: Shanjean Lee, MD; Location: Trout Creek Basalt Columns, Oregon

Shanjean is a 5th year orthopaedic resident at OHSU and is an avid and accomplished rock climber. She's pictured here on the route "The May Fly." This was the first female ascent of this route which, at one time, was the most difficult route on the basalt columns rising above Trout Creek. Other accomplishments include free ascents of climbs in Mexico, Peru, and the Argentine Patagonia. She was also the consulting medical physician for the Academy Award winning movie *Free Solo*.



Letter from the OHSU Chairman

On the surface, certain demographic trends can seem counterintuitive. The discordance between what we see and what we expect may reveal a deeper truth. There are two trends associated with orthopedic surgeons that when I first saw them, they mystified me. The first is that orthopedic surgeons are the most dissatisfied doctors and the second is that 50% of orthopedic surgeons change their first job within three years and 70% change their first job within five years. Both of these demographic trends speak to general discontent. But why? Our profession is one of the most sought after and competitive specialties to enter. The exceptional individuals that enter our profession should be bright enough to ascertain a path to their own happiness.

I suspect that there are reasons behind these two unfortunate statistics. The first is that most equate happiness and contentment with a fulfilment of wants. It may be that the life when they arrived in practice does not fulfill their lofty expectations. We hear about other surgeons with more patients, better infrastructure, better compensation etc. and may feel that we deserve more. I have met some serial job changers in orthopedics, and their stories are always about what was wrong with their previous situations and never about the unsettledness that comes from their wants and inner anxiety.

Many surgeons and trainees come to me for advice about their future employment, including reading over their contracts. If they are interested, I do talk about the contentment that comes from knowing that you have enough and that true happiness must include a strong element of mission in a job. Otherwise, I suspect, you may be forever chasing after something that does not exist.

Sincerely,
Jung Yoo, MD
Chair and Professor, OHSU Department of Orthopaedics & Rehabilitation

Letter from the OHSU Program Director



Dear Alumni and OJO Readers:

Once again the residents have produced another amazing version of this journal. Each successive year I work with residents I am reminded again of their passion for learning and the excitement for Orthopedics as a surgical profession. They truly do keep things fresh.

The OHSU Orthopedics Residency Program continues to thrive. We are still matching five new interns each year, and graduating five steeled surgeons. Their faces change, but the drive to be a competent surgeon remains unchanged. In 2019, we matched four women out of the five spots, however, they will replace a class of five graduates with three women in that group. OHSU has long been a place with a few female surgeons in training. Our program continues to work on diversity in order to best train all types of orthopedic surgeons for careers nationally, in the Pacific Northwest, or in rural Oregon. You can see from the list of graduates that they do move on to great fellowships and wonderful careers after their time at OHSU.

As the list of graduates grows a little longer each year, our alumni group grows a little larger. The alumni reception at the Las Vegas AAOS 2019 meeting was the largest ever. How delightful to see so many former residents back with a smile! The Annual meeting also demonstrated further growth of the research program at OHSU. With multiple podium presentations, posters, ICL's and more, it was difficult to attend every OHSU program. As the department continues to develop its research capacity, expect to hear more from both faculty and residents in the future. Obviously, Beals Day in June every year is another opportunity locally to both connect with the current OHSU Orthopaedics program, as well as a chance to meet your former resident colleagues. Beals Day is also a chance to look back on how orthopedic education is very much unchanged in 2019. It still relies upon the hard work of our mentors to teach, lead and help the next generation grow. Rod Beals certainly still had the twinkle of delight in his eye as he caught a resident learning. Hopefully we can all maintain that delight every day at work. I'm sure reading through this journal will match your expectations today. Enjoy it!

Sincerely,
Darin Friess, MD
Residency Program Director

Good Samaritan Regional Medical Center Orthopedic Surgery Residency Program

Letter from the Program Director



I am pleased to write this letter as I complete my first year as the program director for the Orthopaedic Program here at Good Samaritan in Corvallis. We have seen many changes as our program continues to grow and develop. I feel like we have established some great teaching traditions here.

All three of our graduating chiefs have chosen to complete fellowships in Sports Medicine next year. We wish them luck though we know they don't need it. Our fourth years are already moving seamlessly into the leadership roles they will assume next year. I believe that one of the strengths of our program is the resident involvement at all levels. Our residents are a great team of individuals who really work as a team and help each other out. They provide feedback to me and ideas about the program that allow me to make meaningful improvements.

We are also making changes to the program based on feedback from ACGME. We are so thankful to Shriners Hospitals for Children for the education they have provided our residents. We will be transitioning to Randall Children's Hospital for our Pediatric Orthopaedic education next year. We are also thankful to Dr. Bruce Le in Visalia, California, for the spectacular hands on arthroscopy experience he and his partner have provided our residents. All of our Sports Medicine training will be transitioned back home to Oregon next year. Our residents have shown great resilience and flexibility to take these changes in stride.

Of course, our biggest goal continues to be ACGME accreditation. Our application will be submitted at the end of June. We hope that three is a charm for us! I am working closely with the Executive Director for Orthopaedics at ACGME to be sure we have crossed all our t's and dotted all our i's. Dr. Friess has been tremendously helpful with much of this process, too. I'm looking forward to finding ways our programs can continue to collaborate.

Sincerely,
Jacque Krumrey, MD
Residency Program Director
Samaritan Health Services

Faculty Directory 2018-2019

OHSU

Adult Reconstruction



Thomas Huff, MD



Ryland Kagan, MD



Kathryn Schabel, MD
Medical Director,
Comprehensive Joint
Review Program

Foot & Ankle



James Meeker, MD

Orthopaedic Oncology



Yee-Cheen Doung, MD
Director, Clinical
Operations



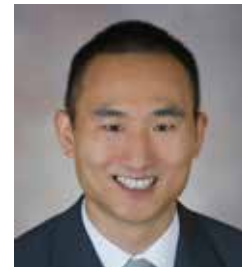
Kenneth Gundle, MD



James Hayden, MD, PhD
Director, Quality



Matthew Halsey, MD



Scott Yang, MD

Pediatrics

Physical Medicine & Rehabilitation



Hans Carlson, MD



Nels Carlson, MD
Assistant Dean of
Continuing Professional
Development



Erik Ensrud, MD

Podiatry



Trish Ann Marie Otto, DPM

Faculty Directory 2018-2019

OHSU

Research / Basic Science



Brian Johnstone, PhD
Director, Research



Lynn Marshall, ScD



Jayme Hiratzka, MD
Director, Spine



Clifford Lin, MD



Jung Yoo, MD
Chairman

Spine

Sports Medicine (Surgical)



Jacqueline Brady, MD
Associate Residency
Program Director



**Dennis Crawford, MD,
PhD**
Director, Sports Medicine



Andrea Herzka, MD



Darin Friess, MD
Director, Trauma &
Residency Education,
Vice-chairman



Zachary Working, MD

Trauma

Upper Extremity



Adam Mirarchi, MD
Director, Hand and
Upper Extremity



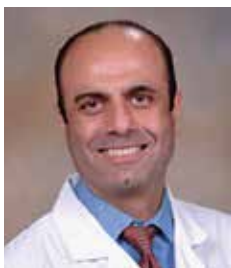
Omar Nazir, MD



Robert Orfaly, MD

Faculty Directory 2018-2019

Portland VA Medical Center



Lucas Anissian, MD, PhD



Mark Berkson, MD
Director of
Orthopedics



Kenneth Gundle, MD



Ryan Wallenberg, MD

Shriners Hospital for Children



Robert Bernstein, MD
Chief of Staff



Michael Aiona, MD



Jeremy Bauer, MD
Director of Education



Daniel Bouton, MD



Krister Freese, MD



Katie Fuchs, MD



Heather Kong, MD



J. Krajbich, MD, FRCS(C)



Ellen Raney, MD



Dennis Roy, MD



Michael Sussman, MD



Michelle Welborn, MD

Faculty Directory 2018-2019

Legacy Emanuel Hospital



Doug Beaman, MD
Foot & Ankle



Britton Frome, MD
Hand/Upper Extremity



Richard Gellman, MD
Trauma



Steve Madey, MD
Hand/Upper Extremity
Site Director



Amer Mirza, MD
Trauma/Adult
Reconstruction



Corey Vande Zandschulp, MD
Trauma

Kaiser Permanente, Pediatrics



Stephen Renwick, MD



Ronald Turker, MD

Faculty Directory 2018-2019

Orthopedic + Fracture Specialists



Brett Andres, MD
Sports Medicine /
Joint Replacement



Alex DeHaan, MD
Joint Replacement
Site Director



Paul Duwelius, MD
Joint Replacement



Jason Kurian, MD
Sports Medicine /
Joint Replacement



Mark Manoso, MD
Spine Surgery /
Joint Replacement



Hans Moller III, MD
Fracture + Trauma



Rolf Sohlberg, MD
Upper Extremity
Medical Director



Kimberly Workman, MD
Lower Extremity /
Joint Replacement

Program Fellowships 2018-2019

Sports Medicine Primary Care Fellows



James Suchy, MD



Nick Welter, MD

Spine Fellows



Vivek Natarajan, MD



Thuy Nguyen, MD

Hand Fellow



Russell Jared Madsen, MD



New Faculty Spotlight:

A Q&A session with Ryland Kagan, MD

By: Trevor Barronian

Hometown: Portland, OR

Medical School: Albany Medical School, Albany, NY

Residency: OHSU, Portland, OR

Fellowship: Adult Reconstruction and Hip Preservation, University of Utah, Fellowship Director Christopher L Peters, MD

Favorite restaurant in Portland: Los Gorditos, a no-nonsense Mexican joint with great vegan and vegetarian options.

Tell us a bit about yourself.

I married a fellow Portland native over 2 years ago. We have two wild dogs who join us on every adventure we embark on, including a recent road trip to Alaska. Together we enjoy exploring everything the great Northwest has to offer; camping, mountain bike riding, hiking and rock climbing. I am a mediocre but enthusiastic snowboarder and surfer and a proud two-time Association of Saturday Softballers league champion, and greater Portland soccer district division 1 champion; however, since returning for practice, I have graduated to the affectionately named "Old Boyz" team in the over 30 league.

What brought you back to OHSU?

The opportunity to Practice at an academic medical center with an ability to have continued mentorship from Dr. Huff and Dr. Schabel was key in motivating me to return to OHSU. Additionally, I am honored to have the leadership of Dr. Yoo as chairman to help guide me into academics and help me improve as both a clinician and researcher.

What are some goals you have for your practice?

At OHSU, we already provide world class orthopaedic care to some of the most complex patients from around the region. But there are always ways we can improve in terms of transforming the way we deliver care, and I am excited to work with our department as we develop Orthopaedic eConsults, Telehealth, and

Enhanced Referrals. These have the ability to add value to our health care system and I am excited that OHSU and our department have made a commitment to being a leader in this endeavor.

What is one of the biggest difficulties with transition from fellowship to being an attending?

Communication with all members of the health care team has been something that I work on improving daily. This often is with other physicians, LPN's or nurses. I have found that I needed to make a lot of personal improvements to medical documentation and since starting have had support from Epic, our electronic medical record, to make improvements to clinic templates. Also, having the support of a medical scribe in most clinics has been key helping me improve.

Do you have any research interests or projects which you are looking forward to pursuing?

My biggest interest in research is on how we can use technology to evolve the way we deliver care and add value to the health care system. As a department we are starting to use eConsults, further our ability to offer Telehealth, and Enhanced Referrals. As the physician leader in our department for these projects, I plan on studying these initiatives in terms of their significance to both patients and the overall health care system.

What is something you enjoy about living in the PNW?

As a Portland native it is a great honor to be able to provide care to the patients of the Pacific Northwest. It is an honor to be able to give back to the community that made me who I am. I enjoy meeting and providing care to the patients of this region and learning more about the great northwest.



New Faculty Spotlight:

A Q&A session with Zachary Working, MD

By: Trevor Barronian

Hometown: Kirkland, WA

Medical School: University of Pittsburgh, Pittsburgh, PA

Residency: University of Utah, Salt Lake City, UT

Fellowship: Trauma, Orthopaedic Trauma Institute, University of California at San Francisco

Favorite restaurant in Portland: My Grill

Tell us a bit about yourself.

My wife, Selene, and I both grew up in the Pacific Northwest, here in Portland and in the Seattle area. Selene also speaks medicine; she has worked as an independent inpatient PA in Infectious Diseases at our last three hospitals over 7 years. We have been active all our lives and all of our extracurricular interests revolve around the outdoors. If we aren't running, we're in the water or on the slopes. If Portland ever gets a major league baseball team, I'll be first in line camping out for tickets. We are expecting our first child, a baby girl, in June.

What brought you to OHSU?

I came to OHSU in the pursuit of developing a career as an academic fracture surgeon. We were prepared to move anywhere in the country in this pursuit, and so the opportunity to do so in the Pacific Northwest was a perfect fit for us. OHSU's reputation as a tertiary center for high complexity pelvic, acetabular, and periarticular fracture care meant that OHSU was exactly where I wanted to work. I am particularly motivated to teach and live in the day-to-day work of a residency program. The constantly changing training relationships keep every day exciting and new. I've always known I wanted to teach; long before medicine I coached for years in competitive baseball circles and residency feels just like home (without the pushups).

What is the biggest difference between practicing in Oregon and where you trained?

OHSU actually is quite similar to the program in Utah where I trained. I particularly like the 5 residents per year size, in which the program is small enough to be able to have meaningful personal relationships and investment with each resident but is big enough that people can have some space and sense of renewal rather than repetition. Perhaps the greatest difference is the days of rain.

Do you have a personal interest in a specific aspect of trauma surgery, and why?

My greatest interest is the treatment and rehabilitation of pelvic ring injuries. Because of the heterogeneous nature of injuries and anatomy, we still understand so little with regards to how much fixation is required and where fixation has to go. Mostly pelvic ring theory has been taught in silos of knowledge (see: Routt, Starr) and I think a lot of pelvic surgery is done to mimic a mentor's philosophy. I think the next 20 years will drift us towards a greater mechanistic understanding of how to rebuild rings. My secondary interest is in prevention and treatment of post-traumatic infection. I am particularly interested in the development and optimization of drug delivery.

What is one of the biggest difficulties with transition from fellowship to being an attending?

In what may be the understatement of the century, it certainly is different to know how heavy the weight of responsibility will be, than to live it.

Do you have any research interests or projects which you are looking forward to pursuing?

I am particularly interested in seeing the Collagen X: Fracture Healing project get off the ground at OHSU. Collagen X is a transient intermediate in endochondral ossification, has a measurable degradation product in the blood stream, and is absent in healthy adults. The blood test was developed at the Portland Shriners Hospital as part of a Bill and Melinda Gates grant for the study of achondroplasia and incidentally was discovered to correlate with fracture healing. A collaborative effort between the Shriners group and UCSF was published in

2017 demonstrating that the molecule could be measured. I comanaged the secondary study as a fellow at UCSF to demonstrate gross correlation between Collagen X and fracture healing in mice. We are commencing the tertiary study, a multicenter clinical study with OHSU as the key campus, in 2019 in humans to see whether Collagen X can help predict fracture healing.

What is something you enjoy about living in the PNW?

Sunrises and sunsets in the Cascades. Hard to beat.



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AAOS welcomes Dr. Robert Orfaly to its leadership ranks

By: Jennifer Smith, OHSU School of Medicine



**Robert Orfaly, M.D.,
FRCS(C),**

Robert Orfaly, M.D., FRCS(C), associate professor of orthopaedics and rehabilitation, OHSU School of Medicine, is now chair of the American Academy of Orthopaedic Surgeons (AAOS) Board of Councilors (BOC). Dr. Orfaly took on the role at the organization's

2019 Annual Meeting; he is also chair of the AAOS Membership and Leadership Development Committee.

The BOC consists of more than 100 members elected by state and regional orthopaedic societies, and serves as an advisory body to the AAOS Board of Directors, Councils and Committees. The BOC also manages the Academy's relations with state and regional orthopaedic societies and conducts a wide range of programs to strengthen and support them. The BOC chair serves as an officer of the AAOS Board of Directors.

Dr. Orfaly was elected to the position of BOC secretary two years ago, and has been an active volunteer with the Academy for more than a decade. The AAOS honored him with the Distinguished Volunteer Service Awards in 2010 and 2013 and the AAOS Achievement Award in 2019.

Dr. Orfaly's areas of interest includes shoulder arthroplasty, rotator cuff disorders, upper extremity trauma, shoulder biomechanics, and orthopaedic implant design. He is a past-president of the Oregon Medical Association and the Oregon Association of Orthopaedic Surgeons and served as a member of the American Medical Association Orthopaedic Section Executive Committee.

Engaging with orthopaedics: an update on the OHSU Orthopaedic Surgery Interest Group (OSIG)

By: Henry Fox, Warren Nielsen, Thomas O'Toole, Duncan Ramsey MD, Kenneth Gundle MD

The goal of the OHSU Orthopaedic Surgery Interest Group (OSIG) is to cultivate medical student interest in the field, as well as to provide resources and opportunities for departmental involvement and career exploration. We are pleased to report another year of growth and educational enrichment for interested students, as OSIG's membership has increased from 170 to 199 medical students in the past year.

OSIG offers an unparalleled number and quality of events on campus. Shortly after matriculation, OSIG hosts several "sterile technique workshops" to orient first and second year medical students to the operating room. Orthopaedic perioperative staff teaches students how to properly gown and glove and to safely move around in the sterile field. This training prepares students for early exposure to the operative setting. Forty students participated in the 2018 workshops, 90% of whom had never learned how to scrub in previously. These forty students comprised 25% of the first-year medical school class. Another exciting offering is the First Assist Program, which pairs attending physicians with medical students as first assistants for a full day of surgery. This sought-after program allows preclinical medical students the opportunity to directly participate in orthopaedic care, hone operative skills, and build or deepen relationships within the Orthopaedics department.

OSIG's largest expansion in the past year has been the Orthopaedic Surgical Anatomy series, held at OHSU's VirtuOHSU Simulation Lab. When resident surgical training on body donors concludes on several select mornings, a group of medical students are given a clinically-oriented

lecture by faculty and then led through a focused dissection of an anatomical region by residents and faculty. Students learn widely utilized surgical approaches and landmarks, and discuss common injuries and operative treatment for the given region. Featured sessions have included Foot and Ankle, Shoulder, as well as Hip and Pelvis. These events have proven to be a valuable forum for resident teaching and resident-medical student exchange, and a well-received supplement of clinically oriented musculoskeletal anatomy in preparation for rotations.

Another integral element of OSIG offerings is its monthly research meetings, in which invested students, residents, and attendings "run the list" of ongoing research projects in the department. This setting is ideal for collective problem solving through research barriers, collaborating on project ideas, and pairing medical students looking for research projects with residents and attendings in need of team members. This environment is largely responsible for the twelve Orthopaedics posters at OHSU's 2018 Research Week—the most of any department—as well as many publications in peer reviewed journals annually. Additional events that advance OSIG's goal of residency preparation and support include the annual "Research Trajectory" talk and other informal mentoring events surrounding preparation for clinical rotations and The Match.

OSIG has also widened its outreach with the group's first ever participation in "Mini Med School," a day-long program of activities and mentorship for over 160 Portland high school and college students from backgrounds underrepresented in medicine. OSIG's station

included gowning and gloving, fracture reduction and fixation on wooden "bones," and a review of introductory musculoskeletal anatomy.

We are looking forward to the continued growth of OSIG as it continues to enrich the medical student training experience and foster collaborative engagement between faculty, residents, and medical students. Feel free to visit OSIG's new website at: <https://www.ohsu.edu/xd/health/services/ortho/research-training/osig.cfm>

2018-2019 OSIG Student Leads:

Thomas O'Toole, Warren Nielsen, Henry Fox

Resident Lead and Research Advisor:

Duncan Ramsey, MD MPH

Faculty Sponsor and Research Advisor:

Kenneth R. Gundle, MD

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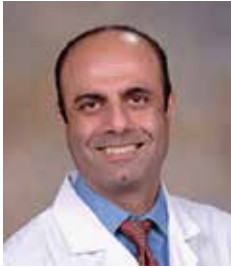
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An interview with Dr. Lucas Anissian

By: Erik Woelber, MD



**Lucas Anissian, MD,
PhD**

At the 2019 AAOS meeting in Las Vegas this year, I had a chance to sit down with Dr. Lucas Anissian to discuss some of the latest goings on at the Portland VA. Dr. Anissian is an arthroplasty specialist, and one of the more senior surgeons in the

Orthopedics Department, where he has recently implemented a new perioperative protocol that has been yielding strong initial results.

To start, could you tell us a little bit about your story and how you ended up at the Portland VA?

I was born in Iran and moved to Sweden in my late teens. I went to medical school in Sweden and completed my internship there as well. I then went to California and did a one-year research fellowship at Loma Linda University (which formed the basis for my PhD thesis at The Karolinska Institute), and then went back to Sweden for my residency. In one of my last rotations in Stockholm, I met my wife, who is an American citizen. We got married and decided to come to the US for my fellowship in Chicago at the University of Illinois. I did a second fellowship in Buffalo and was then offered a job in Evanston, a suburb of Chicago. Eventually, I ended up in Portland!

Can you tell us about some of the broader changes that have occurred over the last couple of years at the VA?

Yes, we have had a lot of changes over a short period of time since I arrived in late 2015. At that time, Dr. McCarron had just retired and Dr. Berkson became the Chief of Orthopedics at the VA. We also had some mid-level providers retire,

so Dr. Berkson and I sat down and discussed how to reshape the Orthopedics Department at the VA.

The first big changes were with the recruitment of new faculty. Dr. Gundle was recruited from the University of Washington and splits his time between the VA and OHSU; Dr. Wallenberg was recruited from among the graduating OHSU Orthopaedics residents. In the last two years, we've also hired four new mid-level providers. Part of the impetus for these changes was that we wanted the day-to-day functions of the VA Orthopedic Service to be run by full-time providers, which would hopefully allow more of a focus on education for the residents that rotate with us. We've been working out the kinks over the last couple of years, and now feel that we have a good work flow that allows for both better patient care and a greater focus on resident education. We've been collecting feedback from residents and, so far, the changes seem to be well-received. Are we 100% where I want us to be? No, but I do feel like we're on the right track.

Some of the other changes that you've made at the VA include changes in your operative approach and post-op care for total knees and total hips. Can you describe some of those changes and why you decided to make them?

A few years ago during an AAOS meeting I noticed that one of the major challenges in total knee arthroplasty surgeries is post-op pain management. When I came back from the meeting I started looking at our own pain management regimen at the VA. Coincidentally, at that time we were having difficulties with bed management, and were having to cancel cases because there were no beds in the hospital to

admit our post-op patients to. The combination of these two issues prompted me to take a closer look at our perioperative regimen.

In February 2017 we started a project looking at enhanced recovery after arthroplasty surgery. The project was established on 4 pillars: patient selection, optimization, expectations, and continuous reevaluation and education. We had excellent knowledge and experience to quickly establish the selection and optimization parts. However, to improve post-op pain management and shorten length-of-stay, we had to change our culture. With a systematic approach, these issues were identified and then carefully analyzed by our team. One of the most striking changes resulting from this new effort is our length-of-stay after total knee arthroplasty. Our average length-of-stay after primary total joint arthroplasty is now 1.2 days.

That's a big change! Do you feel that with such a drastic change in such a short interval, you've experienced any pushback?

I think there was certainly some doubt expressed by staff who were used to doing things in a certain way for a long time, but the majority were supportive of these changes when they noticed the declining length-of-stay. We have stepwise shortened our length-of-stay without increasing our ER visits, complication rate, or readmissions, which is key. It is one thing to decrease length-of-stay, but equally important to not have readmissions or complications due to a shortened length-of-stay.

What is the feedback been like from the patients?

It's been very positive. They absolutely love our team approach and the optimization. Some patients are hesitant of the idea of discharge at postoperative day 1, fearing that they might not be recovered enough to discharge home or they have had a friend who spent 20 days at a SNF after the same surgery. However, with information and education we gain their trust and their willingness to follow our protocol. The



Drs. Loren Black, Courtney Bell, Lucas Anissian, and Natalie Zusman

patients are coming back for first follow-up feeling well, most of them have stopped taking pain medications, haven't had any adverse events, and seem to really appreciate having been able to be discharged home early. Of course, we still have 2% that are discharged to SNF.

In that same vein, every hospital benchmarks themselves against other hospitals. How is the VA in Portland doing compared to other VA's? What are we doing well and what do you feel we need to improve?

We pay very close attention to quality metrics that let us know how we're doing compared to other hospital systems. In terms of readmission rates, infection rates, dislocation rates, return to OR rates, and length-of-stay, the Portland VA is at or near the top in all of these categories. For length-of-stay for example, there is one other VA hospital in the nation that has a length-of-stay after total joint replacement of 1.1 days, so we are second in the nation in that category with an average day of 1.2 days. Of note however, 98% of our patients discharge directly home which is an exceptionally high rate, and significantly higher than other hospitals. Since our enhanced recovery protocol was implemented, we have had less than 1% surgical site infections, reoperations, or 30-day readmissions.

In terms of the environment overall at the VA, what do you think it is that makes the VA hospital system unique compared to other places that we rotate?

One of the advantages of working at the VA is that we have the luxury of not worrying about the insurance status of our patients, or

how they are going to pay for the care we give them. Like any other hospital, there are significant administrative challenges when you want to make significant changes to the system, and perhaps even more so at the VA. For example, when I arrived in 2015, I wanted to use tranexamic acid as part of my arthroplasty protocol in order to reduce the rate of blood transfusion. Making this change required a major investment of time and effort on my part, including giving talks to the Anesthesiology Department and negotiating with administration.

What was the evidence for the changes that you helped bring to the VA?

Many of the changes that we've made have not been fully validated in randomized controlled studies. However, when you go to conferences and talk to surgeons from other hospitals, you get a feel for what is on the cutting edge and what direction things are moving. Now, I'm not suggesting that every new idea is definitely worth implementing, but gradual implementation of new ideas can sometimes solve intractable problems. One example is that we noticed that one of the causes of extended stays after total joint arthroplasty was post-op urinary retention. We did a literature review and found that giving patients Flomax before surgery was rarely contraindicated, and may have a significant effect on our rates of urinary retention. Since we've implemented this particular protocol, we have had zero extended stays caused by post-op urinary retention after arthroplasty surgery.

Do you expect that some of these ideas will be more widely embraced by the orthopedic community over time?

I think so. The issue is that we have to be able to show the numbers. We have our own experience to guide us, but if we expect others to adopt these protocols, we need to have hard evidence. This is a particular challenge at the VA where we may not have as robust a research infrastructure as other hospitals do.

In terms of the research infrastructure, as far as I'm aware there are no full-time research assistants at the Portland VA. Nevertheless, you have several quality improvement projects ongoing. Do you expect that the Portland VA will become a more research-oriented institution, especially with some of the new hires who have a strong research background?

Certainly. New faculty like Dr. Gundle who have extensive research experience will contribute to and strengthen our research program. My hope is that we can get a dedicated research associate who can help to continuously follow cohorts of patients in these quality improvement studies that are ongoing.

What are your goals for the Department going forward?

One of my main projects is trying to implement a non-opiate based pain management protocol after joint replacement surgery. We also want to continue our streak of having no post-op transfusions since we implemented our new protocol, and to continue to shorten the length-of-stay, hopefully down to an average of one day.

What attracted you to orthopedic surgery and to arthroplasty specifically?

As a kid I was always fascinated by putting things together and taking them apart. I remember I damaged several radios and the TV in our home. My parents were not very happy when they had to buy another TV! I pulled them apart but I couldn't put them back together. So when I was in medical school and considering specialties, I loved the immediate feedback that you get in orthopedic surgery; you do your reduction, you see the result on the X-ray, and the patient walks out the door. I'm glad I went into orthopedics and I would definitely choose this field again.

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Lunch with Dr. Paul Duwelius

By: Jason Laurita, MD



Paul Duwelius, MD

I recently had the pleasure of sitting down for lunch with Dr. Paul Duwelius, one of the orthopaedic surgeons operating at Providence St. Vincent Hospital, and a partner in the Orthopedic + Fracture Specialists private practice. OHSU orthopaedic

surgery residents spend 10 weeks operating with Dr. Duwelius and colleagues during the fourth year of residency. Their group has a broad orthopaedic practice, allowing residents to focus the rotation on whatever area of orthopaedics they are interested in.

By reputation, Dr. Duwelius is an accomplished arthroplasty surgeon who is very invested in resident education. He is also a prolific researcher, and the president of Operation Walk Freedom to Move, an organization of doctors and volunteers who perform surgery and provide training to medical personnel in developing countries. I sat down with him to learn more about the latest developments at St. Vincent and Orthopaedic + Fracture Specialists.

Dr. Duwelius is always eager to get OHSU residents involved in research projects at Providence St. Vincent, and has had some notable recent successes, including presentations at this year's annual AAOS meeting in Las Vegas by Drs. Courtney Bell and Shanjean Lee. Dr. Bell and Dr. Duwelius assessed endoscopic iliopsoas tenotomy for impingement in the setting of prior total hip arthroplasty. Dr. Lee's project looked at the reliability of the Vancouver classification for fractures in cementless total hip replacements. For both of these projects, the residents were able to take advantage of Dr. Duwelius' deep team of research talent, including a biostatistician and full-time research assistant.

Other projects either recently published or in the works include a comparison of robotic vs. traditional total knee replacements, a critical look

at the routine use of antibiotic cement for total knee replacements, and the traits of "bundle-busters" for total joint arthroplasty. He is also curating a new national total joints registry within the Providence Healthcare system, which is one of the largest contributors to the American Joint Replacement Registry.

Another fascinating project in the works at Orthopedic + Fracture Specialists is based on an app that is being funded by Apple and developed by Dr. Duwelius' team. The app will sync with an Apple Watch being worn by patients after total knee replacement and track patient's activity and rehab progress. The app will also send videos of relevant rehab exercises to the patients, and remind patients to continue their rehab if they are falling behind. Dr. Duwelius hopes to randomize patients to either have the app or go the traditional rehab route and compare the outcomes.

Dr. Duwelius also has an interest in studying the variability of perioperative anesthesia practices in the Providence system. Anecdotally, he noticed that for a given set of cases, say, total knee replacements, there seemed to be a relatively high degree of variability in terms of how the Anesthesia Department manages these patients. Some underwent general anesthesia, and some received a combination. In addition, times from wheels-in to starting the case varied widely. He has now collected intraoperative data on anesthesia practices for arthroplasty cases at Providence nationally, and has completed a preliminary analysis to quantify the variability that will be presented at an upcoming meeting.

Outside of research pursuits, the Orthopedic + Fracture Specialists practice continues to expand while maintaining its focus on training the next generation of Orthopaedic surgeons. Thanks very much to Dr. Duwelius for taking the time to update us on their latest exciting developments.

Orthopedics abroad; Davao city in the southern Philippines

By: Grant Sun, MD

Many of the orthopedic surgeons we work with as residents work internationally as part of medical missions performing surgery or instructing surgeons in lower- or middle-income countries. I was fortunate enough to travel with Dr. Gellman on his first trip to Davao City in the southern Philippines to teach Dr. Jun Valera techniques in deformity correction with the Taylor Spatial frame. Dr. Gellman met Dr. Valera 2 years ago through SIGN Fracture Care International, a nonprofit orthopedic organization that provides education and orthopedic implants to surgeons in over 50 developing countries around the world.

Our team included Dr. Gellman with his family as well as an Emanuel scrub tech, Linde, and a representative with Smith and Nephew, Todd Neal. I rounded out the team as a fourth-year orthopedic resident at OHSU. As many know, middle income countries like the Philippines, have a high rate of orthopedic deformity from either congenital abnormality such as Blounts disease or post-traumatic malunions. As the only pediatric trained orthopaedic surgeon in his region, Dr. Valera has many patients with severe deformities that can benefit from the use of the Taylor Spatial frame.

In the fall of 2017, Dr. Valera spent a week in Portland after the SIGN conference learning the

basics of deformity correction. Over the past year, SIGN shipped recycled ring fixation components and struts from Drs. Beaman and Gellman to Dr. Valera's hospital, Tebow Cure. There are six CURE Network hospitals around the world, all specializing in pediatrics. The CURE hospital in Davao City has sponsorship by Tim Tebow, the professional football quarterback, whose father worked in Davao for many years as a missionary.

Tebow CURE serves a unique niche for the entire country where kids come with deformities others refuse to treat. Our days in Davao began with lectures on deformity correction, seeing patients, performing 2 days of surgery and then 2 half days of organizing the frame equipment, following up on the patients for explanation of distraction osteogenesis and creating their computer programs for the correction. Dr. Valera learned quickly and he will continue to communicate with Dr. Gellman by email or WhatsApp to monitor this first group of patients as well as future cases.

My overall impression was overwhelmingly positive. The Filipino people are friendly and appreciative. Not only was I able to further my understanding of Taylor Spatial frame application but I was also reminded of the healthcare we all too often take for granted in the United States. Each trip may affect only a dozen lives directly; however, Dr. Gellman's goal and that of SIGN is to teach the teachers. With their new armament of knowledge, the ripple effect may include thousands. Along the way we learned how delicious fresh lumpia could be and how stinky durian is, but above all, new friendships were made and smiles were had even the next day with our patients on their way to a new future.



Adductor canal block versus liposomal bupivacaine peri-articular injection in total knee arthroplasty patients: a randomized prospective study. Than J; Westlake B; Kim J; Pipitone O; Ryan J.

BACKGROUND

Post-operative pain can be difficult to manage in patients undergoing total knee arthroplasty (TKA). The optimal operative pain management strategy has not been established. The objective of this study was to compare post-operative outcomes of liposomal bupivacaine peri-articular injection (PAI) to a single shot adductor canal block using bupivacaine HCl in patients undergoing primary TKA.

METHODS

We performed a randomized, prospective study of 57 patients with primary knee osteoarthritis who were treated with TKA by a single surgeon. Twenty-eight subjects received intraoperative liposomal bupivacaine PAI and 29 subjects received an adductor canal block using bupivacaine HCl performed just prior to surgery. Intraoperative peri-articular medications, pre-operative oral pain medications, spinal anesthetic technique, and post-operative pain management protocols were identical between study groups. The primary outcome of interest was change in Visual Analog Scale (VAS) pain scores, which were recorded pre-operatively and on post-operative day zero, one, two, four, and seven. Secondary measures included the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores, knee range of motion, post-operative ambulation distance, and hospital length of stay (LOS). Study outcomes were compared between treatment groups at each recorded time point through a two-sample t-test or Pearson's chi-squared test. Mixed effects models were used to further explore the relationship between study outcomes and treatment groups over time.

RESULTS

There were no significant differences in demographics including age, gender, and body mass index (BMI) between the two treatment groups. There were no statistically significant differences in pain scores or functional outcome measures between groups at any time point in the follow up period, based on both unadjusted analysis and mixed effects models.

CONCLUSIONS

Intra-operative peri-articular injection with liposomal bupivacaine was equivocal to pre-operative adductor canal block in TKA with respect to pain scores and functional outcome measures in a setting where additional peri-articular injection medications and pre- and post-operative pain medications were controlled.

What markers best guide the timing of reimplantation in two-stage exchange arthroplasty for PJI? A systematic review and meta-analysis. Duwelius PJ. *Clin Orthop Rel Res* 2018;476(10):1984–1985.

WHERE ARE WE NOW?

Periprosthetic joint infection (PJI) remains a leading cause of morbidity after total joint arthroplasty [3]. Although two-stage arthroplasty generally is the most accepted method of treatment for PJI [5], at least in the United States, knowing when to proceed with a two stage reimplantation (and when alternatives, such as single-stage direct exchange, might be worth considering) based on statistically valid studies remains a concern [2].

In the current study, Lee and colleagues [4] performed a meta-analysis of diagnostic studies that provided sensitivity and specificity values of various biomarkers for PJI. Pooled analyses of this sort—this study included data from over 1000 patients with PJI—are useful for determining when surgeons can perform the definitive reimplantation in the course of two-stage exchange arthroplasty for PJI.

The authors found that no single biomarker was superior to all the others in the meta-analysis, nor did a single biomarker sufficiently confirm an absence of infection after the first stage of a two-stage protocol for PJI. The approach that most surgeons now use in practice—employing multiple serum biomarkers, along with synovial joint aspirate biomarkers, plus intraoperative tissue cultures, rather than a single biomarker—remains, in my opinion (and that of the authors of the meta-analysis) the best approach to use. It is important to note that no trials evaluating alpha defensin met inclusion criteria for this meta-analysis, which focused on parameters used at the time of reimplantation during two-stage revision for PJI.

Several studies have attempted to address the difficulty in accurately diagnosing PJI [2, 6], but because of the substantial variability in statistical data and methodological flaws. The Musculoskeletal Infection Society criteria did not incorporate nuclear imaging as a reliable method of diagnosis [7]. These imaging studies are costly, and in my mind, add little value in terms of practical patient care. Presently, at our center, we order a sedimentation rate and CRP. If these are elevated, and there is enough fluid, the joint is aspirated and a synovial cell count, cultures, and alpha defensin test is obtained. The synovial cell count is the most important factor in deciding whether to perform surgery with either a debridement or exchange arthroplasty because cultures or alpha defensin testing may take several days for definitive answers. Intraoperative fluid and tissue at the time of surgery are obtained so that our infectious disease experts have what they need for additional biomarkers to help in treatment.

WHERE DO WE NEED TO GO?

Although there is little guidance in determining which biomarkers are best, the current study [4] illustrates the importance of using numerous biomarkers until we can determine which ones are the most reliable. Still, several questions remain, such as when is the right time to reimplant, and what serum or tissue biomarkers are the most valid? Is an antibiotic holiday necessary after appropriate therapy? What is the proper length of time a patient should be off antibiotics prior to second-stage reimplantation?

The limitations in the current study indicate a need for more uniform evidence-based protocols for PJI identification, as well as determining when to effectively undergo exchange arthroplasty, as the

organisms may vary due to bacterial adherence to the spacers and create problems in identifying these organisms.

As I earlier noted, I do not find nuclear medicine imaging tests to be helpful in most patients, and so future studies might focus on developing more-efficient blood tests. At our center, for example, tissue cultures at the time of surgery can be confusing and getting the results back in a timely fashion has been challenging.

On a related topic, I believe serious consideration should be given to primary exchange arthroplasty in certain situations. While I certainly don't advocate this for all patients with PJI, I do feel that for less-virulent organisms, healthy patients, and early detection of infection that primary exchange arthroplasty can be a viable alternative [7]. If future studies can better identify the best candidates for single-stage direct exchange, treatment might become both more tolerable and less expensive.

HOW DO WE GET THERE?

Large-hospital databases now use electronic medical records to track lab results and patient outcomes. Since most centers do not have extensive experience or a large enough volume of patients undergoing two-stage reimplantation, we need collaborative efforts at identifying appropriate biomarkers through multicenter studies or review of large national databases. Multicenter studies identifying serum biomarkers using novel detection such as the Synovasure® Alpha-Defensin test (Zimmer Biomet, Warsaw, IN, USA) or the RNA polymerase test [1] should be performed and sponsored by industry initially at major academic or high-volume tertiary centers that treat complicated PJIs. Although the RNA polymerase test is expensive, it could be used specifically when the identity of an organism is difficult to determine. This may provide for a more-accurate identification of the initial infection as well as a better understanding of

when to perform the definitive (secondstage) arthroplasty reimplantation [1]. Several other serum biomarkers are available, such as leukocyte esterase, interleukin-6, interleukin-1B, Alpha defensin, and interleukin-17, and we need further studies to help identify which are the best, alone or in combination, at detecting PJI.

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The effect of preoperative malnutrition on postoperative stamina in total joint arthroplasty patients. Philipp T; Black L; Buuck T; Schabel K.

INTRODUCTION

Malnutrition has been evaluated in the orthopedic population and shown to be a risk factor for postoperative complications. Albumin levels < 3.5 g/dl have been associated with increased postoperative complications in total joints patients. Decreased total lymphocyte count (TLC) has been associated with impaired immune function and increased rates of surgical site infections.

The purpose of this study was to evaluate the effect of preoperative nutrition, determined by serum albumin (Alb) and total lymphocyte count (TLC) levels, on postoperative mobility, length of stay, discharge location and rates of return to the hospital within 90 days.

We hypothesized that patients with Alb < 3.5 g/dl or a total lymphocyte count < 1500 cells/mm³ would take fewer steps on postoperative day (POD) 1, have longer lengths of stay (LOS), discharge more frequently to a skilled nursing facility (SNF) and have a higher rate of return to the hospital within 90 days when compared to patients with “normal nutrition” (serum albumin > 3.5 g/dl and TLC > 1500 cells/mm³).

METHODS

A retrospective study was performed. Charts of 628 consecutive patients undergoing total hip or knee arthroplasty, primary or revision, at an academic institution were reviewed. 243 patients met inclusion criteria (Age > 55 years, pre-operative nutrition labs < 30 days prior to surgery, no history of inflammatory disease, cancer, peri-prosthetic infection or acute trauma). Patients were divided into “albumin < 3.5 g/dl”,

“TLC < 1500 cells/mm³” and “normal nutrition” cohorts. Using Student’s T test steps POD 1 and LOS were compared between the albumin < 3.5 g/dl cohort and normal nutrition cohort, as well as the TLC < 1500 cells/mm³ cohort and the normal nutrition cohort. Chi squared analysis was used to compare discharge location and return to the hospital within 90 days between the same paired cohorts. Significance was set at $p < 0.05$ for analysis.

RESULTS

There were no statistically significant differences between the albumin < 3.5 g/dl and TLC < 1500 cells/mm³ groups when compared to the normal nutrition group in regards to percent of revision cases or preoperative body mass index (BMI). 26 patients, 10.7%, had an albumin < 3.5 g/dl. Compared to the 161 patients with normal nutrition these patients took significantly fewer steps POD1 (100 vs. 198 $p=0.008$), had increased LOS (3.62 days vs 3.24 days $p=0.028$), discharged more frequently to a SNF (50% vs. 17% $p=0.0002$) and had a higher rate of return to the hospital within 90 days (23% vs 5.2% $p=0.001$).

68 patients, 27%, had a TLC < 1500 cells/mm³. Compared to patients with “normal nutrition” these patients took a similar number of steps POD 1 (186 vs 198 $p=0.66$), had a similar LOS (3.42 vs 3.24 days $p=0.2$), as well as a similar rate of discharge to a SNF (29% vs 17% $p=0.41$). Patients with a TLC < 1500 cells/mm³ did have a rate of return to the hospital twice as high as the normal nutrition group, though this finding was not statistically significant (10% vs. 5.2% $p=0.14$).

DISCUSSION/CONCLUSION

Preoperative optimization is an important component of the care pathway for patients undergoing elective hip and knee arthroplasty. Malnutrition has been shown to be a potential risk factor for postoperative complications in patients undergoing these procedures. Efforts to optimize a patient's nutritional status prior to elective hip or knee arthroplasty has the potential to decrease costs and improve outcomes surrounding that episode of care.

This retrospective study sought to evaluate the effect of preoperative nutrition, defined by serum TLC <1500 cells/mm³ and albumin <3.5 g/dl, on postoperative endurance, LOS, discharge destination and readmission rate. Our hypothesis was partially supported. The data suggests that a preoperative serum albumin < 3.5 g/dl is a significant risk factor for decreased postoperative endurance, increased LOS, rate of readmission and discharge to a SNF. There was no statistically significant correlation between TLC < 1500 cells/mm³ and LOS, postoperative endurance, discharge destination and readmission rate.

Assessment of a patient's nutrition status via serum albumin level is an important component to preoperative screening prior to total hip and knee arthroplasty procedures. More research is required to evaluate interventions for improving preoperative albumin levels and whether this has an effect on postoperative endurance and overall outcomes.

Hallux valgus correction using a novel 3D printed plate: retrospective case series with two year follow up data. Surgical technique guide and outcomes. Brohard J; Lin J; Callahan R.

INTRODUCTION

Over 130 techniques have been described for the treatment of hallux valgus, ranging from bunionectomies, osteotomies, and arthrodesis. Modern attempts at bunion correction with less invasive joint sparing approaches, such as suture-button techniques, have introduced additional complications like second metatarsal fracture. Suture fixation techniques have evolved in an attempt to avoid these complications. We present our results, with up to 26 months of radiographic follow up including initial correction and complications, with a device (FastForward) which utilizes a 3D printed titanium plate on the lateral cortex of the second metatarsal without bony violation, and reduces the 1-2 intermetatarsal angle using suture tape passed through drill holes in the first metatarsal with PEEK interference screw fixation.

METHODS

This study includes 33 feet in 31 patients. A single board certified and fellowship trained orthopedic foot and ankle surgeon performed all operations over the course of 18 months at a single institution. He utilized a dual incision approach and followed previously described surgical technique for the application of the FastForward device. We retrospectively reviewed radiographs including pre-operative AP, lateral, and oblique images, along with another set at the two and six week post operative periods, and another at the last available follow up visit. Using standard technique we measured the 1-2 intermetatarsal angle (IMA), as well as the hallux valgus angle (HVA), which were used as the primary outcomes. Chart review was performed to determine patient satisfaction with

the outcome. All secondary procedures and complications were recorded based on the chart review and radiographs.

RESULTS

Average radiographic follow up was 15 months. The average initial HVA was 31.4° and IMA was 16.0°. Two-week average HVA was 11.3° and IMA was 7.1°. At six weeks, weight-bearing radiographs showed an average HVA 14.5° and IMA 8.2°. Final radiographic measurements, accounting for either the latest available image or the final image prior to revision, showed average HVA of 24.3° and IMA of 13.7°. Six patients had revision for recurrence or fracture. One underwent removal of symptomatic hardware. Seventeen patients had at least mild radiographic recurrence, without revision. Two patients had an intraoperative fracture of the first metatarsal, and one had an intraoperative fracture of the second metatarsal shaft. There were no infections or wound healing issues.

CONCLUSION

Although this device allows a minimally invasive hallux valgus correction, and provides a powerful initial correction with little bony manipulation, results presented in this study suggest a high rate of radiographic recurrence, and relatively high rates of intraoperative complication, post-operative complication, and revision surgery. We found that more severe deformity had a higher rate of recurrence, suggesting it may be more beneficial in mild deformity, but even in many of these patients we found recurrence and other complications. As a result, this technique has since been abandoned at our local institution with the last procedure being performed in 2016.

Treatment modalities for pathologic fractures of the proximal femur pertrochanteric region: a systematic review and meta-analysis of reoperation rates. Putnam DP; Philipp TC; Lam PW; Gundle KR. *J Arthroplasty* 2018;33(10):3354-3361.

BACKGROUND

The proximal femur represents the most common site of metastatic bone disease in the appendicular skeleton, and associated pathologic pertrochanteric femur fractures contribute to cancer related morbidity and mortality. Controversy exists as to whether these injuries are best managed with intramedullary nailing (IMN) or with arthroplasty.

METHODS

A systematic review of the literature was performed using a PubMed search following PRISMA guidelines to identify studies performed within the last 20 years regarding treatment of proximal femur metastatic lesions with either nailing or arthroplasty with a reported reoperation rate. Sixteen studies were selected for inclusion containing 1414 patients. Pooled estimates and 95% confidence intervals (CIs) for reoperation rates associated with IMN and endoprosthetic reconstruction (EPR) were separately calculated.

RESULTS

The pooled estimate for reoperation for IMN was a median of 9% (95% CI, 5%-14%) and the pooled estimate for reoperation for EPR was a median of 7% (95% CI, 5%-11%). Significant heterogeneity was present in studies reporting on both treatment modalities: for IMN, $I^2 = 55\%$, and for EPR, $I^2 = 51\%$.

CONCLUSION

This systematic literature review identified 16 eligible, nonrandomized, retrospective studies that reported on the results of surgical treatment for proximal femur metastatic disease.

The pooled estimate of reoperation was similar between patients treated with IMN and EPR. Inconsistencies among follow-up and the study designs used limited evidence-based conclusions. As the oncologic care of patients with metastatic disease continues to evolve and improve, patient-specific needs must be carefully considered when selecting an optimal treatment strategy.

Identification of infectious species after resection of soft-tissue sarcomas. Ramsey DC; Jones RA; Weiss JK; Wyatt H; Hayden J; Barnes P; Doung Y-C. *J Surg Oncology* 2019;1-7. doi: 10.1002/jso.25434

BACKGROUND

Pathogenic species in deep tissue infections after soft-tissue sarcoma (STS) resection is largely unstudied, particularly the role of anaerobic bacteria, risks factors for those pathogens, and the time course of infection presentation.

METHODS

Retrospective analysis of 64 patients requiring operative debridement for deep tissue infection after STS resection was undertaken to identify infectious species and study risk factors for anaerobic infections. Kaplan–Meier methods examined the time course of infection presentation.

RESULTS

STS subtypes were most commonly pleomorphic STS, myxofibrosarcoma, and undifferentiated STS. *Staphylococcus aureus* was the most common organism isolated (56%). Twenty (31%) infections were positive for ≥ 1 anaerobic organism. Twelve gram-positive and 10 gram-negative aerobic organisms were isolated. Most (90%) anaerobic-containing infections were polymicrobial, vs 52% of purely aerobic infections. No significant risk factors for anaerobic infections were identified. Median time from tumor resection until debridement was significantly greater for anaerobic infections (54.5 days) than for purely aerobic infections (29.5 days; $P = 0.004$), a difference so pronounced that using “presentation after 53 days” as a proxy for the presence of anaerobic pathogens had an accuracy of 81%.

CONCLUSIONS

Because polymicrobial and anaerobic bacterial infections are common, we strongly support antibiotic use with anaerobic coverage at debridement, particularly for infections presenting later.

A systematic review of the utility of postoperative imaging in the management of pediatric supracondylar humerus fractures. Zusman NL; Barney NA; Halsey MF; Yang S. *J Pediatr Orthop* [in press]

BACKGROUND

Recently published studies call into question the clinical utility of postoperative radiographs in the management of pediatric supracondylar humerus (SCH) fractures. This topic has been addressed as part of the American Academy of Orthopaedic Surgeons Appropriate Use Criteria, although recommendations regarding serial radiographs were not included as part of the discussion. The purpose of this systematic review is to summarize the recent literature regarding the utility of postoperative radiographs as part of the management of supracondylar humerus fractures.

METHODS

A systematic review of the literature published between 1/1/2000 and 12/31/2017 was conducted using PubMed/MEDLINE and SCOPUS databases to identify studies relevant to postoperative management of SCH. Eight studies met the inclusion criteria, from which data pooled estimates and an analysis of heterogeneity were calculated.

RESULTS

The pooled estimate of changes in fracture management based on postoperative radiographs was 1% (0.98 ± 0.33). Significant inter-study heterogeneity was observed with an I² test statistic of 76%. Changes in fracture management included prolonged immobilization following pin removal and return to the operating room.

CONCLUSION

There is a paucity of articles focusing on the utility of postoperative radiographs in changing fracture management of SCH, the most common upper extremity fracture in children. There is a very low rate of change in management based on imaging, and frequently authors commented that the management change could have been prompted without routine serial radiographs. The cumulative findings of these studies suggest routine postoperative radiographs after SCH fractures are infrequently associated with changes in management. Practitioners should consider postoperative protocols with the intention of identifying early postoperative alignment loss or when complication is suspected in order to prevent excessive routine radiography in the management of pediatric SCH fractures.

Hip arthrography complicated by air embolism in infants. A report of 2 cases. Bell C; Greene N; Kato M; Goldstein R; Yang S. *J Bone Joint Surg Case Connect* 2019;9(1):e9.

CASE

We report 2 cases of infants with developmental dysplasia of the hip who underwent arthrography of the hip with use of air for structure identification, which resulted in a presumed air embolism and deep oxygen desaturation. This led to the hypothesis that there is an increased potential of air embolism in the pediatric population given the vascular anatomy of the hip.

CONCLUSION

These 2 cases document the important and not well-known complication of air embolism during air arthrography, which resulted in a change of practice for the authors. We strongly recommend against the use of air as an adjunct to routine arthrography in children.

Hip arthroscopy complicated by a deep vein thrombosis in a patient with May-Thurner Syndrome. A case report. Lieberman EG; Bell CD; Herzka A. *J Bone Joint Surg* 2018;8(3):e57.

CASE

A 20-year-old woman underwent hip arthroscopy with a labral repair, a femoral neck osteoplasty, and acetabular rim trimming. Six weeks after surgery, she presented with leg pain and edema, and was found to have an extensive deep vein thrombosis (DVT). Additional imaging studies revealed apparent extrinsic compression of the left common iliac vein, a vascular anatomic variant consistent with May-Thurner syndrome (MTS).

CONCLUSION

Thromboembolic events in patients undergoing low-risk procedures should raise concern for additional risk factors, including MTS. Identifying this variant in patients is important to prevent future thrombotic complications.

A biomechanical comparison of all-inside cruciate ligament graft preparation techniques.

Wichern CR; Skoglund KC; O'Sullivan JG; Burwell AK; Nguyen JT; Herzka A; Brady JM. *J Experimental Orthopedics* 2018;5(1):42.

BACKGROUND

The all-inside cruciate ligament graft preparation technique has become popular due to its utility in sparing a growing physis, preserving a tendon in ACL surgery, and/or reduction of pain. However, few studies have compared graft preparation techniques to determine the ideal construct for cruciate ligament reconstruction. We sought to compare biomechanical properties of two quadrupled all-inside cruciate ligament graft preparation techniques and three alternative all-inside graft preparation techniques that may be used when the available tendon is too short to be quadrupled.

METHODS

Fifty porcine extensor tendons were evenly divided into five groups (n = 10) representing all-inside graft preparation techniques, including two quadrupled (Quad-A, Quad-B) and three alternative methods (Tripled, Folded, Two-Doubled). Each graft construct underwent preconditioning (10 loading cycles from 20 to 50 N at 0.1 Hz), cyclic loading (500 loading cycles from 50 to 250 N at 1.0 Hz) and load-to-failure (tension applied at 20 mm/min).

RESULTS

Quad-A and Quad-B demonstrated no significant differences in cyclic displacement (10.5 ± 0.3 vs 11.7 ± 0.4 mm; $p = 0.915$), cyclic stiffness (1086.2 ± 487.3 vs 460.4 ± 71.4 N/mm; $p = 0.290$), pullout stiffness (15.9 ± 4.3 vs 7.4 ± 4.4 N/mm; $p = 0.443$), ultimate failure load (641.2 ± 84.7 vs 405.9 ± 237.4 N; $p = 0.672$), or ultimate failure displacement (47.3 ± 6.7 vs 55.5 ± 0.7 mm; $p = 0.778$). The mean cyclic displacement of the Two-Doubled group was significantly greater than the Quad-A (29.7 ± 2.2 vs 10.5 ± 0.3 mm; p

< 0.001), Quad-B (29.7 ± 2.2 vs 11.7 ± 0.4 mm; $p < 0.001$), Tripled (29.7 ± 2.2 vs 11.3 ± 0.2 mm; $p < 0.001$), and Folded group (29.7 ± 2.2 vs 13.3 ± 0.2 mm; $p < 0.001$). There were no other statistically significant differences between the three alternative all-inside graft preparation techniques.

CONCLUSION

The current study demonstrates the biomechanical properties of two quadrupled all-inside graft constructs, Quad-A and Quad-B, are not significantly different. When the available tendon is of insufficient length, the Two-Doubled group demonstrated more than twice the cyclic displacement of all other graft techniques, and is therefore not recommended for use in all-inside cruciate ligament reconstruction.

Trochlear length is an important factor in trochlear dysplasia and patellar instability.

Moulton SG; Otlans PT; Joseph A; Nguyen J; Crawford DC; Brady JM.

BACKGROUND

Trochlear dysplasia is known to be a risk factor for recurrent patellar instability. Some surgeons address the supratrochlear “boss” by removing this cartilage-covered surface. Classifying trochlear dysplasia currently focuses on trochlear shape, sulcus angle, and depth. We theorized that the “trochlear height” is important in patellar instability. We examined the imaging studies of patients in two groups: one with patellar instability (PI), and one with ACL tears. We hypothesized that PI patients would have shorter trochlear groove heights compared to the ACL patients, and that patients in either group with trochlear dysplasia would exhibit shorter trochleae.

METHODS

This IRB approved retrospective chart review included patients cared for by two sports medicine fellowship trained orthopaedic surgeons. Patients with recurrent patellofemoral instability requiring surgery were identified. Age-matched patients who underwent isolated ACL reconstruction were selected for comparison. Exclusion criteria included unsatisfactory preoperative lateral knee xrays or MRIs, or prior knee surgery. Images of 73 PI knees and 148 ACL knees were combined and randomized to eliminate bias, then examined by four blinded reviewers. Image evaluation included Dejour classification, Caton Deschamps index, modified Insall-Salvati ratio, trochlear height, supratrochlear boss size, sulcus angle, and trochlear depth.

Independent sample t-tests were used to compare continuous variables and chi-squared tests were used to compare categorical

variables. ANOVA tests with post hoc pairwise comparisons and Bonferroni-adjusted p-values were used to determine whether trochlear heights differed among Dejour groups. ANOVA tests with bivariate analysis were used to assess the relationship of trochlear height and boss size.

RESULTS

PI patients had a shorter trochlear length compared to ACL patients (9.86 ± 5.41 vs 11.70 ± 5.11 , $p=0.015$). Interobserver reliability among the four reviewers was high for trochlear length (0.518-0.888 95% confidence interval, $p<0.001$). There was a larger percentage of PI patients classified as Dejour B or D (i.e. trochlear dysplasia that might warrant surgical intervention) on xray (Dejour B 15% vs 5%, $p=0.016$, Dejour D 8% vs 0%, $p<0.001$) and MRI (Dejour B 16% vs 7%, $p=0.039$, Dejour D 10% vs 0%, $p<0.001$). Patients with Dejour D trochlear dysplasia on xray had a smaller trochlear height compared to patients with Dejour B trochlear dysplasia ($p=0.023$). However, a difference in trochlear height was not found when comparing the other Dejour grades of trochlear dysplasia. A smaller trochlear height correlated with a larger supratrochlear boss size ($r=-0.277$, $p<0.001$).

CONCLUSION

Patients with recurrent patellar instability had significantly shorter trochlear heights compared to patients with ACL tears. Patients with severe trochlear dysplasia (Dejour D) had a shorter trochlear height compared to patients with less dysplasia. Our findings suggest that trochlear groove height can be reliably measured, and is an important factor in recurrent patellar instability. The correlation between a short trochlear groove and a larger supratrochlear boss calls

into question boss removal as a routine surgical intervention.

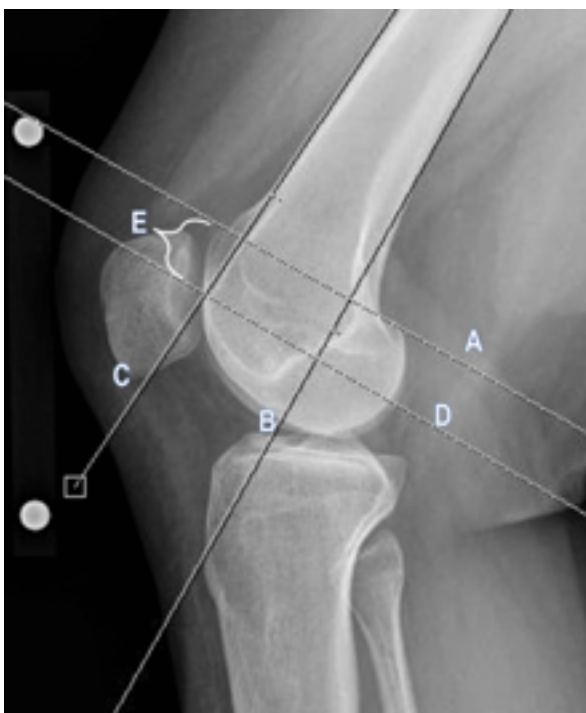


Image 1 Trochlear Height

A line (A) was created perpendicular to the posterior femoral cortex (B) at the level of the posterior condylar intersection. An anterior reference line (C) parallel to the posterior cortex was created. Line (D) parallel to line C was formed at the level of the anterior and proximal portion of the trochlea. The trochlear height was equal to the difference in height (E) between line A and line D.

The high incidence of fracture of femoral grafts used in anterior lumbar interbody fusions is directly associated with smaller graft height, however revision is unnecessary for fusion.

Philipp T; Radoslovich SR; Yoo JU.

DESIGN

Retrospective Chart Review

OBJECTIVES

To identify the incidence of, and variables correlated with, femoral ring allograft (FRA) fracture following anterior lumbar interbody fusion (ALIF).

METHODS

All patients that underwent ALIF using FRAs at an academic institution over 10 years were included. Post-operative radiographs were reviewed by both the corresponding and senior authors; a fracture and no-fracture group were created for comparison. Patient and surgical characteristics were extracted from electronic medical records. Frequency data comparisons were performed using contingency table analysis; comparisons of means were analyzed for continuous variables. A multivariate linear regression model was developed using screw use, graft height <12mm, index level, and weight as variables.

RESULTS

76 FRAs in 59 patients were identified, 13 (17%) of which fractured. Age, sex, smoking status, use of buttress screws, weight, index level, and presence of spondylolisthesis were not correlated with incidence of fracture ($p>0.05$). There was a significant correlation between the height of FRA and incidence of fracture. Two percent (1/52) of grafts ≥ 12 mm and 50% (12/24) of grafts <12mm fractured ($p < 0.0001$). Using ordinary least squares regression, this result was found to be independent of patient weight, use of screws, and index level. Nine of ten patients did not require revision surgery to achieve fusion.

CONCLUSION

Graft height was the only variable correlated with incidence of FRA fracture. Graft height <12mm is an independent risk factor for FRA fracture in patients undergoing ALIF and their use should be avoided in ALIF procedures.

Cost-effectiveness analysis of syndesmotic screw versus suture button fixation in tibiofibular syndesmotic injuries. Ramsey DC; Friess DB. *J Orthop Trauma* 2018;32(6):e198-203.

OBJECTIVES

To evaluate the cost effectiveness of suture buttons compared with syndesmotic screws for repair of tibiofibular syndesmotic injuries.

METHODS

A decision tree model was constructed to describe outcomes after syndesmosis repair using suture buttons and syndesmotic screws from the perspective of a capitated health care system. Outcomes were uneventful healing, removal of symptomatic implants, deep infection, and persistent diastasis requiring revision. Weighted literature averages were used to estimate variables for a baseline model. Outcomes were measured in quality adjusted life years. Procedure and implant costs were derived from Medicare reimbursement rates and the University Health System Consortium. An incremental cost-effectiveness ratio threshold of \$50,000 per quality-adjusted life years was used to evaluate cost-effectiveness.

RESULTS

The baseline model did not identify suture buttons to be cost effective. Sensitivity analysis demonstrates the model to be exquisitely sensitive to small changes in reoperation rates and implant price. At median University Health System Consortium implant prices, if the removal rate for symptomatic screws is below 13.7%, then screws are cost effective. If the screw removal rate is greater than 17.5%, then a suture button is cost effective. Within this interval, detailed analysis of the model suggests that screws may be the cost-effective strategy, but that determination should be taken with caution.

CONCLUSIONS

Moving away from the practice of routinely removing all syndesmotic screws has changed the financial landscape of syndesmosis repair. At their median cost, suture buttons are likely to be cost effective over screws for symptomatic screw removal rates greater than 17.5%. Cost effectiveness is sensitive to changes in implant removal rates and the number of devices used per patient.

The efficacy of tranexamic acid on reducing blood transfusion rates in intertrochanteric or subtrochanteric femur fractures: initial results from a single-center randomized controlled trial. Yakel S; Than J; Sharp J; Den H; Krumrey J.

INTRODUCTION

Approximately 300,000 people over 65 years of age are hospitalized for hip fractures annually in the US. Peri-operative blood loss is one of the most common complications of hip fractures. The rates of allogenic blood transfusion in the peri-operative period for hip fracture patients are associated with increased costs, longer hospital stays, and increased complications. Tranexamic acid (TXA) is widely used to reduce peri-operative blood loss and decrease the risk of blood transfusion. This study serves to evaluate whether pre-operative administration of TXA has an effect on reducing blood loss in intertrochanteric and subtrochanteric (extracapsular) femur fracture patients. We hypothesized that administering TXA on hospital admission reduces pre-operative blood loss, thereby decreasing total blood loss and blood transfusion rates.

METHODS

This was a prospective, double-blinded, randomized trial looking at 100 patients with intertrochanteric and/or subtrochanteric femur fractures. IRB approval was obtained in September 2015 and patient recruitment occurred from October 2015 to January 2019. Patients were randomized to receive either one gram TXA or placebo (normal saline) intravenously as early as possible upon hospital admission. The primary outcome of interest was blood transfusion rates, which were tracked from hospital arrival to post-operative day (POD) 5 or date of discharge.

RESULTS

Forty-six patients were randomly assigned to the TXA treatment group and 54 were randomly assigned to the placebo group. Six patients from the TXA group were excluded from analysis (one

surgery was cancelled, one patient received the intervention after the initiation of surgery, and four patients had multiple fractures). Five patients from the placebo group were excluded from analysis (one declined the intervention after being randomized, one surgery was cancelled, and three patients had multiple fractures), which resulted in 40 patients in the TXA group and 49 patients in the placebo group.

Seven patients (17.5%) in the TXA group and 18 patients (36.7%) in the placebo group required blood transfusions post-operatively. None of the patients in either group received blood transfusions before surgery. Compared with the placebo group, the relative risk of blood transfusion in the TXA group was 0.46 [95% CI, 0.22-1.03, $p=0.046$] and the absolute risk reduction for blood transfusion was 0.19 [95% CI, 0.01-0.37]. No statistically significant differences were found between the two groups for estimated blood loss during surgery, length of hospital stay, 30-day mortality rate, and 30-day incidence of major complications.

CONCLUSION

A single bolus dose of one gram IV TXA administered upon hospital arrival significantly reduced the need for blood transfusion when compared to a saline placebo. The risk of receiving a blood transfusion in the TXA group was about half the risk of a patient in the placebo group (RR=0.46, 95% CI = 0.22, 1.03, $p=0.046$). TXA was not associated with an increase in major complications compared to the control treatment. These findings support administering TXA on hospital admission for intertrochanteric and subtrochanteric femur fractures to decrease blood transfusion rates without increasing complication rates.

Use of a large tenaculum clamp as a reduction technique for treatment of distal radius fractures. Fox HM; Thompson AR; Nazir OF; Mirarchi AJ. *J Hand Surg Am* 2019 Jan 16. (Epub ahead of print).

Distal radius fractures are common upper extremity injuries requiring operative treatment. In the context of management with a volar locking plate (VLP) a number of described techniques assist with restoration of individual anatomic parameters such as radial length, volar tilt, and articular congruity. Herein, we present a surgical technique that utilizes a large tenaculum bone clamp to provide an efficacious reduction in several planes. With anterior-posterior (AP) compression, the clamp enables volar translation of the distal fracture fragment. This compression also decreases the interval between the distal portion of the VLP and fracture fragments. With a rotational force, the clamp can restore volar tilt of the articular surface. By positioning the tines of the clamp across the fracture in the coronal plane, a clamping force can correct medial or lateral translation of the distal fracture fragment. Proper reduction significantly minimizes complications such as abrasion or rupture of the flexor tendons along the volar locking plate.

Venous thromboembolic events after shoulder arthroscopy: a case-control study.

Williams M; Vela L.

INTRODUCTION

Venous thromboembolic events (VTE) following arthroscopic shoulder procedures are rare and, until recent years have received little attention in the orthopedic literature. The earliest literature on the topic is provided by Burkhart et al. in 1990 which consists of a case report regarding a DVT following arthroscopic shoulder surgery which was due to an underlying structural abnormality. More recent literature has defined the incidence of VTE after shoulder arthroscopy at 0.01% after a large review of the English NHS database. After multiple VTE events consisting of both symptomatic PE and DVT were noted at an institution following shoulder arthroscopies, further evaluation of the available literature and a retrospective case-control study were performed. The goal of this study was to define the incidence of VTE following shoulder arthroscopies at one institution and explore possible contributing perioperative risk factors for VTE events in this population.

METHODS

All arthroscopic shoulder procedures occurring at one institution between March 1, 2013 and February 1, 2018 were identified through electronic medical records. Patients with symptomatic PE/DVT events within 90 days post-op were identified. For each PE/DVT case, three control arthroscopic shoulder procedures were randomly selected for comparison. Selected controls occurred within the same work week as their matched case. Data was collected on demographics (age, gender, etc.), patient history and comorbidities, and pre and intra-operative details (pre-op medications, surgical positioning, etc.). Study variables were compared between cases and controls through t-tests and chi-squared tests.

RESULTS

1,886 arthroscopic shoulder surgeries were performed during the study period. 13 patients were identified with symptomatic VTE within 90 days post-op. Of these, 9 were attributed to PE, and 4 to symptomatic

DVT. The overall incidence of PE or DVT within 90 days post-op for this time period was 0.69% (13/1886). These trends should be compared to published incidences of 90-day PE/DVT after shoulder arthroscopy surgery: 0.31%, 0.3%, 0.01%, 0.04%. 10 out of 13 patients demonstrated no known significant risk factors for VTE. Of the remaining three, one patient was found to have a protein C abnormality, another had known sickle cell trait, and a third patient was on hormone replacement therapy preoperatively. The odds of PE/DVT were found to be significantly higher in patients with right sided surgery compared to left sided surgery. 92% of cases and only 54% of controls were right sided surgeries, and when looking at all 1,886 arthroscopic shoulder surgeries in the timeframe of interest, 59% were right side. Other non-significant trends were observed, including higher rates of VTE for females, those with hardware implanted, and those in Beach Chair position.

CONCLUSION

Although VTE events are thought to be rare, our study demonstrates that when studying an entire surgical population at a community hospital, VTE events after arthroscopic shoulder procedures may not be as uncommon as originally reported in the literature. The incidence at our institution does appear to be higher than recent large database reviews. With an aging population and the associated increase in medical comorbidities, it can only be suspected that this complication will become more prevalent in the future. There is little guidance regarding the efficacy or necessity of perioperative thromboprophylaxis for patients undergoing arthroscopic shoulder procedures. Given the evidence in the literature for Aspirin as chemoprophylaxis after total hip and knee arthroplasty, anyone undergoing shoulder arthroscopy over the age of 40 will be placed on daily 325 mg Aspirin for 2 weeks at this hospital in an attempt to prevent further VTE events after shoulder arthroscopy.

Evaluation of endoscopic iliopsoas tenotomy for treatment of iliopsoas impingement after total hip arthroplasty. Bell CD; Duwelius PJ; Wang L; Beckett B; Gehling HA; Wagner MB.



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Medical School: OHSU, Portland, OR

Fellowship plans: Adult Reconstruction, Rothman Institute, Egg Harbor, NJ

BACKGROUND

Iliopsoas impingement after total hip arthroplasty (THA) occurs in up to 4.3% of patients resulting in functional groin pain. Operative treatment historically has included open iliopsoas tenotomy or acetabulum revision. We present a large single surgeon series of patients treated with endoscopic iliopsoas tenotomy for iliopsoas impingement after THA to evaluate the effectiveness and risks.

METHODS

A consecutive series of 60 patients with iliopsoas impingement after THA treated with endoscopic iliopsoas tenotomy was retrospectively evaluated. Outcomes assessed were resolution of pain, change in Hip Outcome Score (HOS), and complications. Radiographs were reviewed by a musculoskeletal radiologist to evaluate component positioning and compare to a control cohort.

RESULTS

At last follow-up (mean 5.5 months), 93.3% of patients had resolution of pain. The HOS activities of daily living (ADL) subscale mean was 57.5 (range, 10.9-89.3; SD 18.8) preoperatively and 71.6 (range, 14.1-100; SD 26.1) postoperatively ($p=0.005$). The HOS sports subscale mean was 37.3 (range, 0-83.3; SD 24.0) preoperatively and 58.1 (range, 0-100; SD 33.2)

postoperatively ($p=0.002$). One complication was reported, a postoperative hematoma managed conservatively. Body mass index and increased offset were associated with iliopsoas symptoms after THA in this series.

CONCLUSION

Endoscopic iliopsoas tenotomy after THA had a 93.3% resolution of pain, clinically important improvements in HOS, and low rate of complications. Endoscopic tenotomy should be considered as a treatment option in patients with iliopsoas impingement after total hip arthroplasty.

Reliability and validity of the Vancouver classification in uncemented periprosthetic hip fractures. Lee S; Wang L; Doung Y-C.



Shanjean Lee, MD

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Medical School: Duke University, Durham, NC

Program Plans: General Orthopedics, VA Sierra Nevada Health Care System, Reno, NV

BACKGROUND

The Vancouver classification of periprosthetic femur fractures divides B1 and B2 subtypes based on the stability of the femoral stem. However, this classification was described and validated with cemented femoral stems. We sought to assess reliability and validity of the Vancouver classification in patients with cementless femoral stems.

METHODS

This is a blinded radiographic study, which included patients treated for Vancouver B cementless periprosthetic femur fractures between February 2007 and December 2017. Adult reconstruction and trauma fellowship-trained orthopedic surgeons graded all preoperative radiographs using the Vancouver classification on three separate occasions. Inter-observer and intra-observer reliability were assessed via the Fleiss' kappa statistic. Validity was assessed via accuracy between radiographic and intraoperative assessments. The Landis and Koch criteria were used to interpret the kappa values.

RESULTS

53 patients with Vancouver B fractures (B1: 8, B2:45) around a cementless femoral stem were included in the study. Five reconstruction-trained and five trauma-trained orthopedic surgeons

graded all radiographs. The inter-observer reliability kappa value was 0.45 (moderate agreement), with all raters agreeing on only 43% of radiographs. Validity analysis showed demonstrated 79% agreement. Overall, 20% (range 14-24%) of unstable B2 fractures were misread as B1 fractures. Intra-observer reliability was 0.71 between readings.

CONCLUSION

The reliability of the Vancouver classification for cementless THA is lower than previously described in cemented femoral stems.

Radiographic assessment alone may be inadequate for determination of stability of cementless stems in periprosthetic femur fractures.

Prevalence of preoperative lower urinary tract symptoms in patients undergoing elective lumbar spine surgery. Lieberman EG; Boone RM; Radoslovich S; Haj V; Hiratzka J; Marshall LM; Yoo JU.



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BACKGROUND

The prevalence of LUTS is unknown in patients with lumbar spine disease. Furthermore, the extent of LUTS severity and the relationship between spine pathology and LUTS is not well documented. Our goal was to determine the prevalence of moderate-to-severe lower urinary tract symptoms (LUTS) in patients undergoing elective lumbar spine surgery, and to describe associations between prevalence, severity of symptoms, demographic variables, and spine pathology.

METHODS

We used the validated International Prostate Symptom Score (IPSS) to assess LUTS severity among elective lumbar spine surgery patients from October 2015 to April 2017 at a single academic institution. Moderate-to-severe LUTS was defined as IPSS score of 8 or more. The IPSS also includes a question to assess urinary bother, for which a score of 4 or more indicates clinically significant bother. Prevalence estimates and 95% confidence intervals were computed in the sample overall, and according to sex, age, and lumbar spine diagnosis.

RESULTS

IPSS data were obtained from 373 patients (97% of those eligible) undergoing elective lumbar spine surgery. Moderate-to-severe urinary symptoms were reported by 46% of these patients, and by 51% of women and 42% of men. Prevalence of moderate-to-severe urinary symptoms increased with age, rising from 38% in patients younger than 40 years to 57% in patients 70 years or older. LUTS prevalence according to spondylolisthesis, stenosis, scoliosis, and herniated nucleus pulposus diagnostic groups were 51%, 50%, 50%, and 31%, respectively. Clinically significant urinary bother was reported by 14% overall, 10% of men, and 18% of women, and prevalence also increased with age.

CONCLUSION

Moderate-to-severe LUTS were highly prevalent in this sample. Urinary symptoms are more prevalent with increasing age, in women, and in patients with stenosis, spondylolisthesis, and scoliosis. Proportionally, fewer patients reported clinically significant urinary bother, which may impact patient reporting and physician identification of urinary symptoms.



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A comparison of novice, resident, and attending orthopaedic surgeon outcomes on six fundamentals of arthroscopic surgery training (FAST) workstation tasks. Otlans PT; Buuck T; Rosencrans A; Zaruta D; Koehler R; Schumaier A; Sullivan JP; Grawe B; Nicandri GT; Brady JM.



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SUMMARY

When comparing 115 subjects (medical students, junior residents, senior residents, and attending orthopaedic surgeons) on six Fundamentals of Arthroscopic Surgery Training modules, there are measurable differences in time to completion, errors, and successfully tied knots that correlate with the subject's level of training.

INTRODUCTION

The Fundamentals of Arthroscopic Surgery Training (FAST) Program offers an arthroscopic skills workstation and curriculum. The program was designed for surgeons in training to acquire and improve arthroscopic surgical skills. More expert surgeons would be expected to take less time to complete procedures while committing fewer errors. The purpose of this study was to compare medical students, orthopaedic trainees, and attending orthopaedic surgeons to demonstrate that time to completion, number of errors, and successfully tied knots is associated with level of training in arthroscopic surgery.

METHODS

Seventy-eight orthopaedic surgery residents and seventeen medical students were enrolled at three orthopaedic surgery training sites. Twenty attending arthroscopic surgeons consisted of

instructors at two Arthroscopy Association of North America Resident Arthroscopy Courses. Each participant completed six modules in random order. For each module, except knot tying which involved tying five knots, the participant completed the task twice, once with each hand in random order. For biting, maze navigation, probing, ring transfer, and suture passage, time to completion and errors were recorded. Number of successful knots was recorded for knot tying. Four groups were compared: medical students, junior residents (post-graduate year 1 through 3), senior residents (post-graduate year 4 and 5) and attending surgeons. Data for each trial was averaged and significance was set at $p < 0.05$.

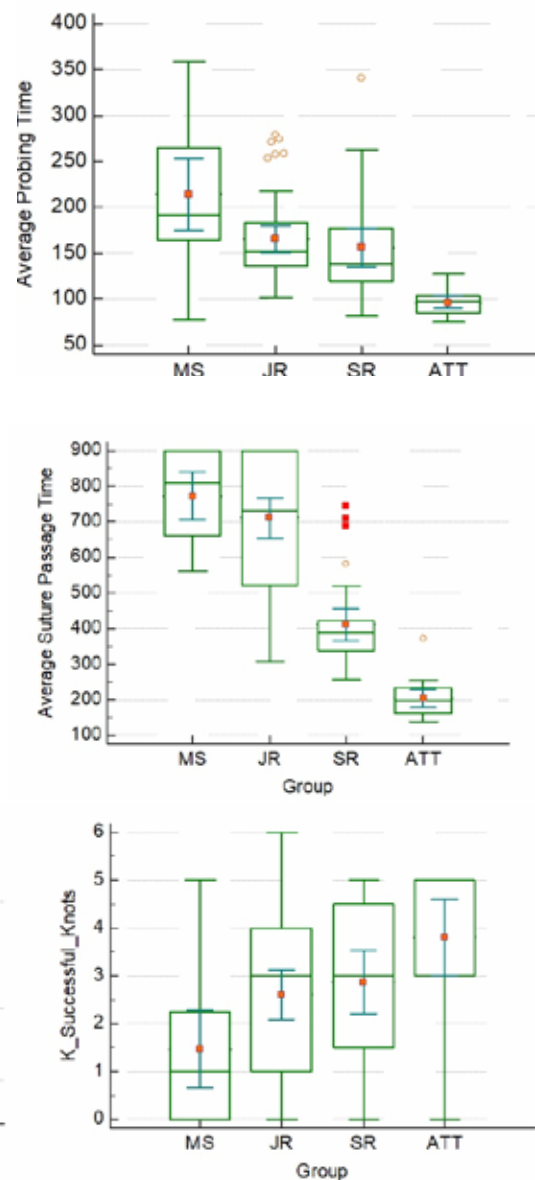
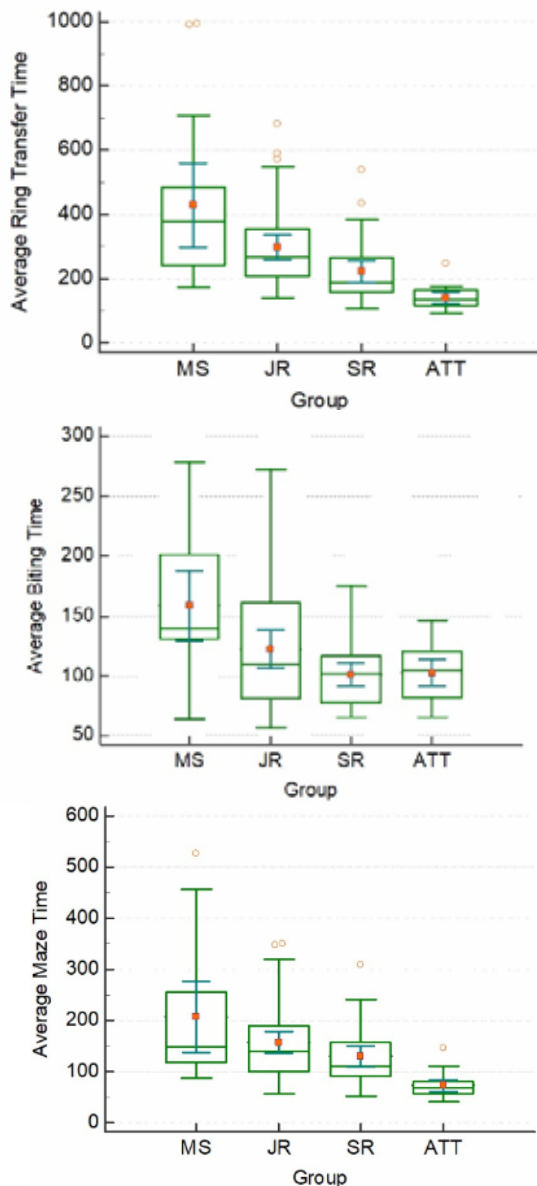
RESULTS

Mean time to completion for biting was significantly slower for medical students compared to other groups (158 vs 101-122 seconds) and attending surgeons made significantly fewer errors than the junior resident and medical student groups (0.1 vs 1.4-2.0 errors, respectively). For the maze and probing completion time, senior and junior residents performed similarly (129-156 s and 156-165 s, respectively) while medical students were significantly slower (207 s and 214 s) and attendings were significantly faster (72 s and 96 s). Error rates completing both modules were

similar. For ring transfer, all groups were significantly different and attendings were fastest, followed by seniors, juniors, and students (140, 221, 297, 428 s). Attendings made significantly fewer errors, and other groups performed similarly (0.9 vs 1.9-2.6 errors). For suture passage, attendings were significantly faster than all groups (203 s), and senior residents (410 s) were significantly faster than juniors and students (711, 772 s), which performed similarly. With regard to passage errors, attendings committed significantly fewer and other groups performed similarly (0.2 vs 1.5-1.7 errors). For number of successfully tied knots, there was no difference between attendings and seniors (3.8 and 2.9 knots), attendings were better than juniors (2.6 knots), and the medical student group was significantly worse than all others (1.4 knots).

CONCLUSION

When comparing medical students, junior residents, senior residents, and attending orthopaedic surgeons on six FAST modules, there are measurable differences in time to completion, errors, and successfully tied knots. In all circumstances, when significantly better performance was observed, it occurred in the more senior group. The FAST program can serve as a valuable tool in detecting objective changes as orthopaedic surgeons' progress in their training and may help develop clinically applicable arthroscopic skills.



Prophylactic stabilization of metastatic femoral lesions has a survival benefit compared to pathologic femur fracture fixation: nationwide analysis in the VA healthcare system.

Philipp T; Summers A; Gundle K.



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Hometown: Olathe, KS

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Fellowship Plans: Spine, New York University, New York, NY

BACKGROUND

The skeletal system is one of the most common sites of metastatic disease (1, 2). It is estimated that over 1.6 million new cancers were diagnosed in 2016 in the United States and more than 250,000 patients are living with metastatic bone disease in the United States. The femur is the most common site of metastatic disease and pathologic fracture in the appendicular skeleton. Providing quality care for metastatic bone disease is an increasing challenge for the United States healthcare community, including orthopaedic surgeons. Questions remain about the magnitude of benefit of prophylactic stabilization, limited in part by the small samples of prior research. Databases that are large enough to capture a large, geographically diverse population are generally administrative in nature and lack the depth of data required to compare differences in population comorbidities nor follow patients long enough to determine survival differences. Therefore, we asked: 1) Is there a survival benefit for prophylactic fixation of metastatic lesions of the femur? 2) When patient comorbidity and cancer type are adjusted does the survival benefit persist?

METHODS

This was a retrospective cohort study utilizing a large nationwide clinically-integrated relational

database. All patient records between Sept 30 2010 to October 1st 2015 within the VA database system were queried using the CPT codes 27187 or 27495, “prophylactic treatment femoral neck and proximal femur” and “prophylactic treatment femur”. This was defined as the prophylactic stabilization population (PSP).

The pathologic fracture stabilization population was defined with a query of the same VA dataset with the ICD-9 codes 733.14 (pathologic fracture neck of femur), 733.15 (pathologic fracture other part of femur) and ICD-9 code 733.10 (pathologic fracture unspecified site) + a corresponding CPT code of 27245 (open treatment femur/hip with nail), 27244 (open treatment femur/hip with plate), 27507 (open treatment femoral shaft fracture with plate) or 27506 (open treatment femoral shaft with nail). Patients defined and extracted from the dataset using the above query parameters were defined as our pathologic fracture fixation (PFF) group.

Patient specific variables were obtained from the database including age, gender, cancer diagnosis, date of death or last follow-up, and comorbidity score. Covariate data was used to create a Cox proportional hazards model for

death in an attempt to adjust for confounders in the two groups.

The primary end point of the analysis was overall survival. Univariate survival was estimated by the method of Kaplan and Meier, with between group differences compared using the log-rank test. Predictor variables of primary cancer type, and Gagne comorbidity score were added to conduct a Cox proportional hazard model for multivariate testing.

RESULTS

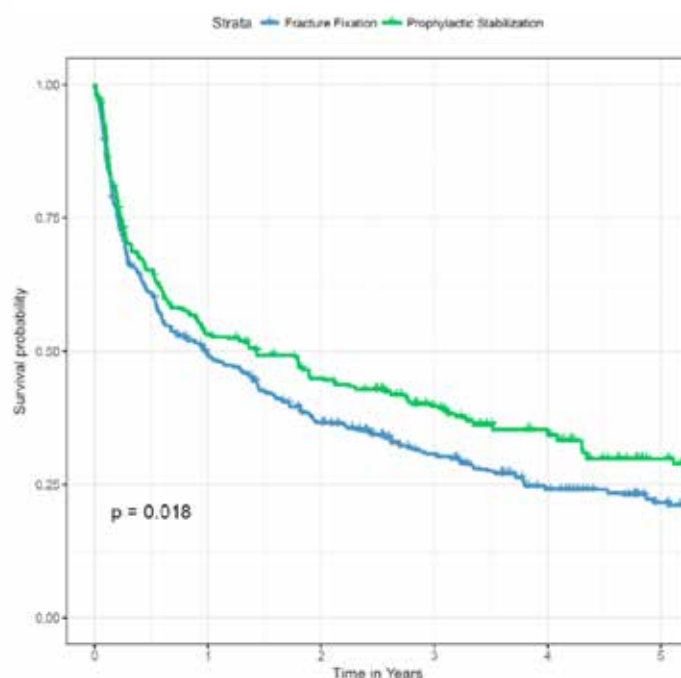
Our initial query yielded 950 patients, 362 (38.1%) that underwent prophylactic stabilization of a femoral lesion and 588 (62%) that underwent pathologic femur fracture fixation. The overall cohort was overwhelmingly male (94.6%). The mean age of the PSP cohort was 67 vs 69 in the PFF cohort ($p < 0.05$). The prophylactic stabilization group had improved unadjusted survival at every time point from 3 months to 5 years following their index surgery. The figure shows the Kaplan-Meier Curve for unadjusted survival by metastatic lesion treatment type. The hazard ratio for risk of death following prophylactic femur stabilization versus pathologic fracture fixation was significantly lower for the prophylactic stabilization group. The risk of death remained significantly lower for the prophylactic stabilization group when the model was adjusted for, Gagne comorbidity score and primary cancer diagnosis are shown in the table.

DISCUSSION

The data presented represents the largest and most detailed study examining differences in mortality between patients treated with prophylactic stabilization of femoral metastatic lesion and patients who undergo fixation of pathologic femoral fractures while controlling for comorbidities. The results suggest that intervening with surgical stabilization of impending pathologic femur fractures secondary to metastatic disease was associated with a

survival benefit for patients when compared to patients that sustain a pathologic femur fracture, even when patient comorbidities' and cancer type are adjusted for. One might infer from these findings that a relatively aggressive approach towards fixation of pathologic femoral lesions is warranted given the relative benefits of early versus late fixation. Further research is warranted to better define how best to identify patients with metastatic femoral lesions and when it is best to intervene with a prophylactic stabilization procedure in an effort to provide this vulnerable population the best possible care.

	Hazard Ratio	P Value
Univariate Model		
Treatment of Metastatic Lesion		0.01
Prophylactic Stabilization	0.82	0.01
Pathologic Fracture Fixation	Ref	
Multivariate Model		
Treatment of Metastatic Lesion		<0.001
Prophylactic Stabilization	0.75	0.002
Pathologic Fracture Fixation	Ref	
Gagne Comorbidity Score	4.0	<0.001
Site		
Hematologic	Ref	
Kidney	3.0	<0.001
Liver	6.6	<0.001
Lung	4.2	<0.001
Prostate	1.8	<0.001



Magnetic spinal growth rods (MCGR) with and without preoperative traction for the treatment of severe scoliosis. Welborn M; Degan T; D'Amato C; Krajbich JI.



Tim Degan, MD

Hometown: Edmonds, WA

Medical School: Midwestern University (AZCOM), Glendale, AZ

Fellowship Plans: Sports Medicine, Baylor University, Houston/San Antonio, TX

SUMMARY

Large rigid curves can be treated with MCGR and preop traction with equivalent correction to smaller flexible curves and maintain correction over time.

HYPOTHESIS

Preop traction will allow equivalent initial postop Cobb angle correction in patients with severe scoliosis undergoing MCGR vs smaller flexible curves.

DESIGN

Retrospective cohort study of a prospectively collected database.

INTRODUCTION

MCGR has improved the surgical treatment of Early Onset Scoliosis decreasing infections by 1/3, but hardware complications are common with a 27.8-46.7% revision rate in under 2 years. Thus the timing and decision of when to use MCGR remains difficult. In this paper we will detail our experience with MCGR, preop traction and larger stiffer curves.

METHODS

MCGR patients radiographs and xrays reviewed for Sagittal and major Coronal Cobb, T1-S1 height and medical records for demographics, prior treatments and complications.

RESULTS

12 revision patients were excluded. 30 patients were included and divided into preop traction vs no traction. Traction group had larger, rigid curves and 50% were syndromic scoliosis. Non-traction group had smaller flexible curves and 61% were neuromuscular scoliosis. Postop change in T1-S1 and postop Cobb and Cobb correction were not significant. Ave follow-up was 576 vs 438 days in the traction vs nontraction groups. 13% of patients experienced complications with an average 15.6 month follow-up.

CONCLUSION

We had larger ave preop Cobb angles and ave correction in both groups vs literature review of 177 MCGR patients ave preop Cobb 65, 36 postop, and absolute correction 29. Traction provides an additional 18% correction compared to flexibility films. Postoperatively neither group lost correction over time and traction patients continued to gain correction despite having more rigid curves preop.

Author disclosures: Michelle Welborn: none. Timothy Degan: none. Charles D'Amato: K2M. Joseph Ivan Krajbich: none.

Postoperative infections following operative management of ankle fractures. Scrivens B; Smith H; Krumrey J; Daudfar S; Pipitone O.



Brian Scrivens, DO

Hometown: Portland, OR

Medical School: Western University of Health Sciences, Pomona, CA

Fellowship Plans: Sports Medicine, University of Buffalo, Buffalo, NY

BACKGROUND

Surgical site infections following operative management of ankle fractures range from 1.4% to 1.5%. In diabetic patients, infections rates are reported up to 19%. Known risk factors include diabetes mellitus, fracture morphology, age, tobacco and alcohol use. Preventing infections and post-operative complications is important for better outcomes and cost-effectiveness.

OBJECTIVES

To determine infection rates in operatively managed ankle fractures at our institution, and compare those rates to national data in order to determine whether infection rates are higher than expected in our population. To explore potential risk factors for infection that may guide future research. To compare the estimated infection rates between two retrospective review methods: ICD codes alone, versus an extensive review of patients charts for readmissions, culture results, and/or ICD codes.

METHODS

Data was included from 120 ankle fracture surgeries including Open Reduction Internal Fixation (ORIF), External Fixation and Ankle Arthroscopy, occurring at GSRMC in 2017 on 116 patient.

Two different methods of review were studies

1. ICD-10 Code method

- ICD-10 codes for infections were used to identify ankle fracture surgery patients with potential post-operative infections
- Chart review was done on the subset of patients with an ICD code for an infection to confirm an infection and determine whether it occurred within 30 days post-operatively

2. Quality Department's Chart Review Method

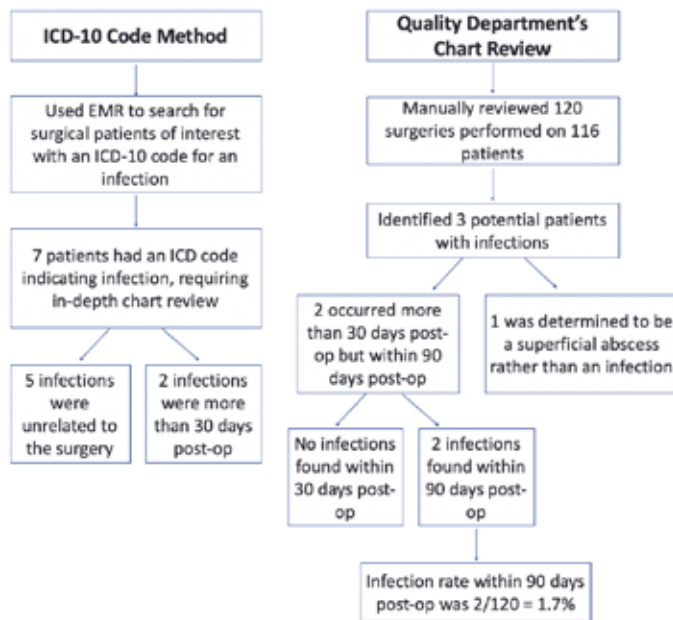
- The Infection Prevention supervisor in the Quality Department at GSRMC reviewed all ankle fracture surgery patients with any readmission, culture results, and/or infection ICD-10 codes in order to determine whether an infection occurred

RESULTS

Table 1. Ankle fracture surgeries performed in 2017 at GSRMC

(Note: For patients with more than 1 surgery, only their first performed surgery is included in Table 1)

	N (%)
# of Patients	116
Type of Surgery	
ORIF Ankle	113 (97%)
External Fixator Ankle	2 (2%)
Ankle Arthroscopy	1 (1%)
Average Age (Min, Max)	50 (12, 88)
Gender	
Male	37 (32%)
Female	79 (68%)
Diabetic	11 (9%)
Using tobacco at time of surgery	17 (15%)
Treated with mupirocin prior to surgery	1 (1%)
MRSA Culture Status	
Not done	68 (59%)
Performed, screened negative	45 (39%)
Performed, screened positive	3 (3%)

Figure 1. Flow diagram of each review method

CONCLUSIONS

- Our 90 day post-operative infection rate of 1.7% is on the lower end of national averages 3, 6
- Given the number of patients and their comorbidities, we feel this is an accurate representation of the infection rate inherent in the management of ankle fractures
- While open fractures would likely increase the infection rate, we excluded them from this study
- Our data shows the relative accuracy of ICD-10 codes versus chart review
- This is useful for future research because data collection using the ICD-10 code method is both accurate and also requires significantly less time/resources than manual chart review

Post-operative opioid use in elective orthopedic surgery: results from patient surveys.

Smith H; Willen R; Pipitone O; Rivera A; Peterman K; Kaiser P; Campaigniac E; Scrivens B.



Heidi Smith, DO

Hometown: Horton, KS

Medical School: Kansas City University of Medicine and Biosciences, Kansas City, MO

Fellowship Plans: Sports Medicine, University of New Mexico, Albuquerque, NM

The over-prescription of opioids has been recognized as an important upstream driver of opioid abuse. Orthopedic surgeons prescribe more narcotics than any other surgical specialty. Surgery has been identified as a risk factor for a patient becoming a chronic opioid user. Patients often receive substantially more pain medication than needed after common surgical procedures. We surveyed 88 patients who received one of four common elective orthopedic surgeries (total knee arthroplasty, knee arthroscopy, shoulder arthroscopy, or ankle fracture open reduction internal fixation) at Good Samaritan Regional Medical Center between July 2017 and January 2018. Patients were called four to six weeks after surgery and were asked questions about opioid medication use, medication disposal, and pain levels. Thirty-five percent of the patients surveyed took less than half of their prescribed narcotic medications. Most notably, out of the patients surveyed who had undergone a total knee arthroplasty, 41% took less than half of the prescribed narcotics. Proper disposal of excess medication also presented an issue for a large portion of the surveyed patients. 67 orthopedic surgery patients had leftover medication (76%). Of these patients, 52 (78%) still had the medication in their possession at the time of the survey. Only 44% of the patients surveyed could correctly report how to safely dispose of excess medication. This study demonstrates that surgeons do play an

important role in the availability of opioids in the community and the excess opioid prescriptions could be reduced by tailoring narcotic prescriptions to the corresponding surgical procedure. This study also demonstrates the need for additional patient education regarding proper disposal of excess narcotic medication.

Resident Directory 2018-2019

OHSU Residents (PGY-4 to PGY-1)

PGY-4 Class



Nikolas Baksh, MD

Hometown:
Lancaster, PA

Medical School:
Case Western
Reserve University,
Cleveland, OH

Fellowship Plans:
Spine, New York
University, New York, NY



Taylor Lara, MD

Hometown:
Memphis, TN

Medical School:
University of Tennessee,
Memphis, TN

Fellowship Plans:
Adult Reconstruction,
Florida Orthopaedic
Institute



David Putnam, MD

Hometown:
Santa Cruz, CA

Medical School:
OHSU, Portland, OR

Fellowship Plans:
Adult Reconstruction,
Scripps Health, San
Diego, CA



Duncan Ramsey, MD

Hometown:
Dallas, TX

Medical School:
University of Texas,
San Antonio, TX

Fellowship Plans:
Orthopaedic Oncology,
Massachusetts General
Hospital, Boston, MA



Grant Sun, MD

Hometown:
Reno, NV

Medical School:
University of Utah,
Salt Lake City, UT

Fellowship Plans:
Foot and Ankle,
Baylor University,
Dallas, TX

PGY-3 Class



Torgom Abraamyan, MD

Hometown:
Glendale, CA

Medical School:
Washington University,
St. Louis, MO

Fellowship Plans:
Sports Medicine



Trevor Barronian, MD

Hometown:
Seattle, WA

Medical School:
OHSU, Portland, OR

Fellowship Plans:
Adult Reconstruction



Jason Laurita, MD

Hometown:
Camden, ME

Medical School:
Dartmouth Medical
School, Hanover, NH

Fellowship Plans:
Undecided



Michael Robbins, MD

Hometown:
Paradise, CA

Medical School:
University of
California, Davis, CA

Fellowship Plans:
Upper Extremity



Sean Sterrenberg, MD

Hometown:
Silverton, OR

Medical School:
University of
Washington,
Seattle, WA

Fellowship Plans:
Undecided

Resident Directory 2018-2019

OHSU Residents (PGY-4 to PGY-1)

PGY-2 Class



Sam Cheesman, MD

Hometown:
Muncie, IN

Medical School:
Indiana University,
Indianapolis, IN



Ryan Hadden, MD

Hometown:
Salem, OR

Medical School:
University of Alabama,
Birmingham, AL



Sam Moulton, MD

Hometown:
Eugene, OR

Medical School:
OHSU, Portland, OR



Erik Woelber, MD

Hometown:
Anchorage, AK

Medical School:
University of
Washington,
Seattle, WA



Natalie Zusman, MD

Hometown:
Portland, OR

Medical School:
OHSU, Portland, OR

PGY-1 Class



Elliott Cole, MD

Hometown:
Memphis, TN

Medical School:
University of
Tennessee, Memphis,
TN



Derek Bond, MD

Hometown:
Hillsboro, OR

Medical School:
OHSU, Portland, OR



Loren Black, MD

Hometown:
Portland, OR

Medical School:
OHSU, Portland, OR



Connor Pihl, MD

Hometown:
Juneau, AK

Medical School:
University of
Washington, Seattle,
WA



Jamil Kendall, MD

Hometown:
St. Thomas, Virgin
Islands

Medical School:
Howard University,
Washington, DC

Resident Directory 2018-2019

Samaritan Health Services Orthopaedic Surgery Residents (PGY-4 to PGY-1)

PGY-4 Class



Eric Krohn, DO

Hometown:
Richland, WA

Medical School:
Lake Erie College of
Osteopathic Medicine,
Erie, PA

Fellowship Plans:
Pediatrics



Jennifer Sharp, DO

Hometown:
Cheyenne, WY

Medical School:
Kansas City University,
Kansas City, KS

Fellowship Plans:
Trauma



Mark Williams, DO

Hometown:
Marietta, GA

Medical School:
Philadelphia College of
Osteopathic Medicine,
Philadelphia, PA

Fellowship Plans:
Adult Reconstruction

PGY-3 Class



Justin Brohard, DO

Hometown:
Decatur, IL

Medical School:
Western University
of Health Sciences,
Pomona CA

Fellowship Plans:
Foot and Ankle



Shaun Conley, DO

Hometown:
St. Louis, MO

Medical School:
Rocky Vista University,
Parker, CO

Fellowship Plans:
Unknown



Justin Than, DO

Hometown:
San Jose, CA

Medical School:
Western University
of Health Sciences,
Lebanon, OR

Fellowship Plans:
Adult Reconstruction

Resident Directory 2018-2019

Samaritan Health Services Orthopaedic Surgery Residents (PGY-4 to PGY-1)

PGY-2 Class



Cleon Dodge, DO

Hometown:
Bloomsburg, PA

Medical School:
Western University
of Health Sciences,
Lebanon, OR

Fellowship Plans:
Sports Medicine



Tyler Petersen, DO

Hometown:
Vancouver, WA

Medical School:
Western University
of Health Sciences,
Lebanon, OR

Fellowship Plans:
Trauma



Babe Westlake, DO

Hometown:
Sparks, NV

Medical School:
Western University
of Health Sciences,
Lebanon, OR

Fellowship Plans:
Arthroplasty/
Oncology

PGY-1 Class



Jared Sanderford, DO

Hometown:
Greeley, CO

Medical School:
Rocky Vista University,
Parker, CO



Teigen Goodeill, DO

Hometown:
Centralia, WA

Medical School:
Pacific NW University
of Health Sciences,
Yakima, WA



Taylor Brown, DO

Hometown:
Appleton, WI

Medical School:
Kansas City
University, Kansas
City, MO

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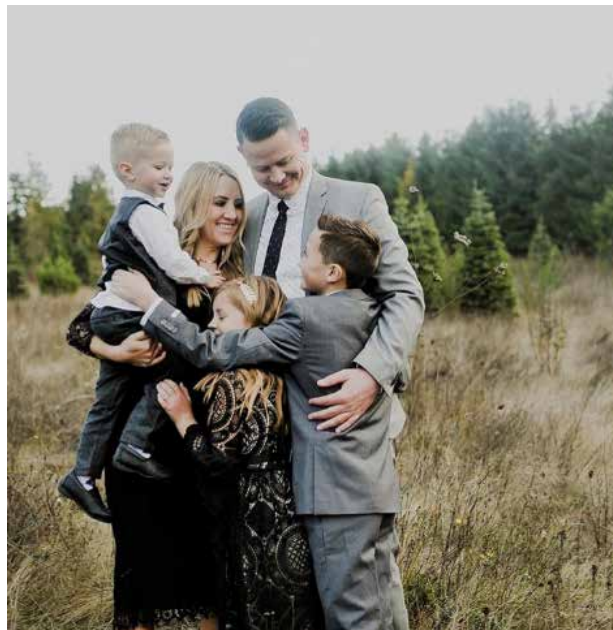
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Alumni Updates: Class of 2016



JAKE ADAMS, MD

They say "time flies when you're having fun..." Well... turns out THEY are on to something. It's hard to believe that my time at OHSU is nearly 3 years in the rear view mirror. After graduating residency I went on to complete an Adult Reconstruction fellowship at the Mayo Clinic in Scottsdale, AZ. It was an incredible year focused on my favorite aspect of Orthopedics, primary and revision joint replacement. Upon completing residency I was convinced that I would leave Oregon and not look back, but to our surprise a fantastic opportunity became available in the South Portland Metro area and I returned to take a position with the Regenerative Orthopedic Center (ROC) in Tualatin/Oregon City. My elective practice consists mostly of primary and revision hip/knee arthroplasty, but as the new guy in town I do quite a bit of fracture care as well (sure glad I paid attention to Drs Friess and Mirza). My first year in practice has been very busy. Turns out building a practice is not for the faint of heart. It's a funny thing really. Who would have thought that after 14 years of formal training, the greatest amount of learning would take place in the first year of practice? It's been a remarkable journey thus far. Private practice has been eye



opening in many respects although it's been fun to learn more about business aspects of running an orthopedic practice/clinic.

As many of you know we started our family very early. We showed up to residency with 2 kids in tow and left residency with 3. Today we're very proud to announce that we have not added any others to the tribe.... this family is complete. My wife Tonya worked very hard during residency to be both Mom, oftentimes Dad (in my absence), and also continued to work to help support our little family throughout my training. She has since stopped working and thoroughly enjoys her very important role as Mom. Our oldest child Luke (12 years old) is in middle school and lives for baseball, friends, and Fortnite (sigh...). Emery (9 years old) loves dance and gymnastics. Carson (3 years old) makes a hobby out of driving Mom and Dad crazy. He is the epitome of 3 year old (sigh... again).

Overall, life after residency has been good to us. I often miss the people and friendships I came to enjoy at OHSU. I am very grateful for my years there as they more than prepared me this amazing career.



KIRSTEN JANSEN, MD

After spending a year in Indianapolis completing my arthroplasty fellowship I moved back home to St. Louis where I took over for a busy retiring surgeon in a small private practice. My work consists of primary hip and knee arthroplasty with a fair amount of revision arthroplasty and general orthopaedic fracture care.

I have an exceptional work family and I've enjoyed establishing myself in the local community. I credit the smoothness of my transition into private practice to the excellent education and training I received at OHSU.

It has also been great to spend time with friends and family, especially my niece and nephews whom I adore. My cats, Tootles and Snuffy, are always around to keep me company when I'm home. I greatly enjoy traveling and I spent a month in Southeast Asia after fellowship. I am looking forward to more international travel later this summer after completing oral boards.



TOM KOWALIK, MD

After residency, I split my fellowship year by spending 6 months training with Dr. Paul Duwelius in Portland followed by 6 months in Sydney Australia with Dr. Rob Molnar. My fellowship was focused on adult reconstruction and some trauma. I'm now in my second year of practice working for OHSU at Tuality in Hillsboro. My practice consists of total joints as well as some general orthopaedics. Tuality has a great small community

feel but is still close enough to Portland to feel urban. I enjoy being a part of OHSU and being able to consult with my residency mentors for advice and help with patient care. I look forward to getting some residents out at Tuality at some point in the future so they can experience a smaller community hospital as part of their training. My wife Julie is a PA in the Ortho Department at the VA and we spend our time outside of the hospital with our dogs and traveling whenever we can.



JARED MAHYLIS, MD

After graduating from OHSU, I moved to Cleveland, OH for my year long fellowship in Shoulder & Elbow surgery at the Cleveland Clinic. I had an incredible time in “Believeland” and was able to see rare and complex pathology at a world-class hospital. During my time I was fortunate to work with mentors like Joseph Iannotti, Eric Ricchetti, Mark Schickendantz and Peter Evans. Following completion of my fellowship and combined with the great training I received at OHSU, I felt more than prepared to enter practice. I currently work for Specialty Physicians of Illinois at Franciscan Health – Olympia Fields, in the suburbs of Chicago. My practice is focused on upper extremity surgery. I am blessed to be a faculty member for the Orthopedic Surgery Residency Program at Northwestern University - Franciscan Health. Having the opportunity to pass on the knowledge and skills that were imparted to me is greatly rewarding. In May of 2018 we welcomed the newest addition to our family with the birth of baby girl Mina. Our family enjoyed our time living in Chicago, but miss the endless green of the Pacific Northwest and Portland.



BLAKE OBROCK, DO

After completing residency I went to The University of New Mexico to complete a fellowship in Sports Medicine. My family and I embraced the cowboy lifestyle and moved to Amarillo Texas. My elective practice focuses on total management of the shoulder and knee, but I also see a good deal of complex trauma. Our family has grown, and we welcomed our youngest daughter Rylee in 2018.

OHSU Beals Memorial Seminar



High School



Residency



Department Chief



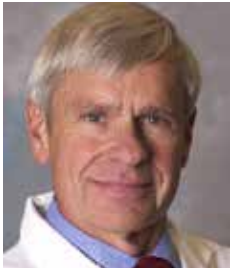
*Consummate surgeon and
dedicated teacher to his last day*

Dr. Rodney Beals was a lifelong “Oregonian” who spent his entire professional career practicing orthopaedic surgery in Portland, Oregon. He was a committed clinician, master surgeon, accomplished researcher, and revered educator. The Department of Orthopaedics established the Beals Memorial Lecture Series out of respect for his scientific accomplishments and his humble guidance and mentorship.

Dr. Beals received his undergraduate degree from Willamette University and his medical degree from the University of Oregon Medical School. He completed his internship at Minneapolis General Hospital followed by a general surgical residency in San Bernardino County Hospital in California. He completed his training in Orthopaedic Surgery at the University of Oregon Medical School in 1961. Dr. Beals joined the faculty and rapidly rose through the ranks, serving as Head of the Division

of Orthopedics from 1981 to 1994. Dr. Beals also served as the first chairman for the Department of Orthopaedic Surgery at OHSU in 1994. He remained an active member of the Orthopaedic faculty at OHSU until the time of his passing on August 7, 2008.

Dr. Beals was nationally recognized for his research on skeletal manifestations of growth disturbances in children. He helped author more than 150 peer reviewed publications. He was a respected teacher and educator. During his tenure at OHSU he helped train over 150 orthopaedic surgeons in residency, helped thousands of patients and mentored countless numbers of medical students. Throughout his remarkable career Dr. Beals represented and personified excellence in medicine and orthopaedic surgery. The Beals Memorial Lectureship is an annual event established in his honor.



Guest Lecturer 2019
**Frederick A. Matsen
III, MD**

BEALS GUEST LECTURER

Frederick A. Matsen III, MD

Dr. Matsen is a tenured full professor in the Department of Orthopaedics and Sports Medicine at the University of Washington and the holder of the Douglas T. Harryman II Endowed Chair in Shoulder and Elbow Research. He chaired the Department for 23 years and was a founding member of the American Shoulder and Elbow Surgeons. He specializes in shoulder reconstructive surgery, including the ream and run procedure, total shoulder replacement, reverse total shoulder arthroplasty, periprosthetic infections and complex revision shoulder surgery.

His clinical interests center on optimizing the safety and effectiveness for patients needing shoulder reconstruction. He performs over 300 shoulder joint replacements per year for individuals with shoulder arthritis or complications of prior surgery. He writes the popular Shoulder Arthritis Blog (<http://shoulderarthritis.blogspot.com>) which has over 2200 posts which has currently over one and one half million page views from over 100 countries around the world.

He is dedicated to providing patients with the best knowledge regarding their shoulder condition along with the most current evidence-based information regarding the options available for their care. His goal is a full patient-surgeon partnership.

OHSU FACULTY SPEAKERS

Darin Friess, M.D., M.P.H.

Dr. Friess specializes in treating arm, leg and pelvic fractures. He has a special interest in treating fractures that have not healed correctly after treatment. He also does surgery for patients with bone infections and infected fractures, which can mean working with several specialists.

Dr. Friess does research on the healing of broken bones and weight bearing after fractures. Dr. Friess enjoys developing relationships with his patients as they are healing and returning to regular activities.



OHSU Faculty Speaker
Darin Friess, MD

Kenneth Gundle, M.D.

Dr. Gundle treats patients with benign and malignant tumors, with a particular focus in sarcoma care, as well as metastatic disease in bone. His research on new ways to improve outcomes that matter most to patients has been presented at regional, national, and international conferences and published in peer-reviewed journals.

Dr. Gundle believes that bone and soft tissue tumors benefit from comprehensive evaluation and a team-based, patient-centered approach to treatment. "At OHSU we have a multidisciplinary team that develops individualized plans of care for patients, bringing the latest technology and research to bear in treating challenging conditions."



OHSU Faculty Speaker
Kenneth Gundle, MD

Shriners Hospital for Children – Beattie Lecture Series



Mr Byron J. Beattie was the owner and operator of a printing plant in Portland, Oregon. Mr Beattie became acquainted with Dr “French” Eldon Chuinard, while Dr Chuinard was the chief of staff at Shriners Hospital for Children, Portland. He was so impressed with the importance of the educational mission of Shriners Hospital that he created an endowment fund to support our local education activities. The first seminar was held in 1985.



Guest Lecturer 2018
Daniel J. Sucato, MD, MS

BEATTIE GUEST LECTURER 2018

Daniel Sucato, MD, MS

Dr. Daniel Sucato is the Chief of Staff at Texas Scottish Rite Hospital for Children since completing the Dorothy and Bryant Edwards Fellowship in Pediatric Orthopaedics and Scoliosis at TSRHC in 1998.

He graduated magna cum laude from Canisius College in Buffalo, NY. Dr. Sucato received his medical degree (magna cum laude) and a Master of Science degree in biophysics from Buffalo School of medicine, State University of New York, where he also completed his general surgery internship, orthopaedic surgery residency and basic science research fellowship.

He served as one of three International Traveling Fellows for the Scoliosis Research Society in 2003. During this three-week fellowship, Dr. Sucato delivered research presentations, studied and discussed landmark cases, observed surgeries at centers throughout Europe and collaborated with international spine experts.

Dr. Sucato is widely published in the area of spinal deformity and has delivered dozens of presentations worldwide. His interests are spinal deformity; thoracoscopic approaches to the spine; hip conditions; adolescent hip dysplasia and its treatment with the Ganz periacetabular osteotomy.

He is a professor in the department of orthopaedic surgery at the University of Texas Southwestern Medical Center at Dallas and is an active staff member at Children’s Medical Center of Dallas. Dr. Sucato is also a member of the American Medical Association; the Texas Medical Association; the Scoliosis Research Society; the North American Spine Society; the Pediatric Orthopaedic Society of North America; and the American Academy of Orthopaedic Surgeons. Dr. Sucato is a consultant reviewer for Spine, the Journal of Spinal Cord Medicine and the Journal of Bone and Joint Surgery.

Shriners Hospital for Children – Dillehunt Memorial Lecture



57TH ANNUAL DILLEHUNT MEMORIAL LECTURE

The Dillehunt Memorial Lecture honors the contribution of a great surgeon and legendary teacher, Dr. Richard Dillehunt, who inspired many orthopaedists. With his keen interest in medical education, he played a prominent role in the development of the medical school on the hill. He was particularly devoted to children and was instrumental in the establishment of the Shriners Hospitals for Children, Portland. He became Shriners first Chief Surgeon in 1920, and served in that position until his retirement in 1943. His legacy continues through the Dillehunt Memorial Trust Fund, sponsoring visiting distinguished Pediatric Orthopaedic Surgeons from throughout the world.



Guest Lecturer 2019
**Pierre Lascombes,
MD**

DILLEHUNT GUEST LECTURER 2019

Pierre Lascombes, MD

Professor Pierre Lascombes is a paediatric orthopaedic surgeon and Chairman of the Division of Paediatric Orthopaedic Surgery and Professor of Orthopaedics in Geneva, Switzerland. Prior to this appointment, he was Head of the Department of Paediatric Orthopaedics and Professor of Anatomy at the University of Nancy, France. Professor Lascombes has a vast experience in scoliosis in children and adolescents, bone deformity correction and limb lengthening, as well as neuromuscular orthopaedics. He has organized several education courses with the SOFOP (French Society of Paediatric Orthopaedics) including the redaction of medical books: Imaging of the hip in children (1985), benign bone tumors (1996), Fractures in children (2005), Long bone deformities and their correction (2009). He contributed to the development of the instrumentation and implants "Legacy" (Medtronic Spine) for the surgical treatment of scoliosis, and implants and instruments for T2 Kids as flexible intramedullary nails. He is currently Past President of the European Pediatric Orthopedic Society (EPOS), as well as The French Paediatric Orthopedic Society (SOFOP).

Resident and Teaching Awards

Leo S. Lucas Outstanding Orthopaedic Educator Award: Presented to the faculty member most instrumental in the development of future orthopaedic surgeons.

Morris Hughes Award: Presented to the resident who best demonstrates concern for patients and for education of the next generation of physicians.

Research Award: Presented to the resident recognized for a commitment to the development, execution and publication of original research during residency.

Rodney Beals Award (New): Awarded yearly by faculty to the best resident based on intelligence, quality of work, work ethic, and effect on the environment.

YEAR	LEO S. LUCAS	MORRIS HUGHES	RESEARCH AWARD	RODNEY BEALS AWARD
2007	Tom Ellis	Rob Tatsumi	Joseph Schenck	
2008	Dennis Crawford	Stephan Pro	Kate Deisseroth	
2009	Darin Friess	Stephan Pro	N/A	
2010	Amer Mirza	Gary Kegel Gregory Byrd	Patrick Denard	
2011	James Hayden	Jayme Hiratzka	Jayme Hiratzka Matthew Harrison	
2012	Jesse A. McCarron	Luke Rust	Dawson Brown Matthew McElvany	
2013	James Hayden	Laura Matsen Ko Jacqueline Munch	Adam Baker	
2014	Adam Mirarchi	Rich Myers	Trevor McIver	
2015	Kathryn Schabel	Dustin Larson	Alexander DeHaan	
2016	Paul Duwelius	Jacob Adams	Thomas Kowalik	
2017	Jacqueline Brady	Ryland Kagan	Michael Rose	
2018	Darin Friess	Dayton Opel	Derek Smith	Elizabeth Lieberman

Just for Fun



Saying goodbye to the senior class, Beals Day, 2018



Grant Sun enjoying a day of kite-boarding in the Columbia Gorge



Senior class, enjoying a break in New Orleans



Jason Laurita teaching Torgom Abraamyan how to enjoy the outdoors



Third year class establishing themselves as the hardest working residents

Just for Fun



Taking a break to enjoy wine country



Joyce Beals and Jung Yoo, Beals Day, 2018



Kenny Gundle taking the bull by the horns in New York



The fourth year class enjoying a Portland summer night



Second year class enjoying the sun in San Diego

OHSU Orthopaedic Program Alumni Directory

GRADUATE	FELLOWSHIP TRAINING	CURRENT PRACTICE LOCATION
2018		
Hannah Altman	Hand & Upper Extremity – University of Chicago, Chicago, IL	
Karlee Lau	Hand & Upper Extremity – University of Alabama, Birmingham, AL	
Dayton Opel	Hand & Upper Extremity – Cleveland Clinic, Cleveland, OH	
Derek Smith	Hand Surgery - Mary S. Stern. Cincinnati, OH	
Benjamin Winston	Arthroplasty – Tahoe Reno Orthopedic Clinic, NV	
2017		
John Cox	Adult Reconstruction - Scripps Health, San Diego, CA	Scripps Health, San Diego, CA
Ryland Kagan	Adult Hip and Knee Reconstruction and Hip Preservation – Univ. of Utah, Salt Lake City, UT	Oregon Health & Science Univ., Portland, OR
Joseph Langston	Adult Reconstruction – Melbourne Orthopaedic Group, Melbourne Australia	Southern Oregon Orthopedics, Medford, OR
Michael Rose	Sports Medicine – Steadman Hawkins Clinic, Denver, CO	The CORE Institute, Phoenix, AZ
Ryan Wallenberg	Orthopedics – St. Vincent Hospital, Portland, OR	VA Portland Health Care System, Portland, OR
2016		
Jake Adams	Adult Reconstruction - Mayo Clinic, Scottsdale, AZ	Regenerative Orthopaedic Center, Tualatin and Oregon City, OR
Kirsten Jansen	Adult Reconstruction - Indiana University, Indianapolis, IN	STL Orthopedics, Chesterfield, MO
Tom Kowalik	Trauma & Adult Reconstruction - Orthopedic + Fracture Specialists, Portland, OR and Sydney Australia Arthroplasty & Trauma	Tuality Orthopaedic, Sports, Spine & Rehabilitation Center, Hillsboro, OR
Jared Mahylis	Shoulder & Elbow - Cleveland Clinic, Cleveland, OH	Specialty Physicians of Illinois, Olympia Fields, IL
Farbod Rastegar	Spine - Cleveland Clinic, Cleveland, OH	Aurora Orthopaedics, Grafton, WI
2015		
Alex DeHaan	Adult Reconstruction - Tahoe Reno Arthroplasty Fellow, Reno, NV	Orthopedic + Fracture Specialists, Portland, OR
Troy Miles	Adult Reconstruction - UC Davis, Davis, CA	Shasta Orthopaedics, Redding, CA
Dustin Larson	Hand and Upper Extremity - Univ. of New Mexico, Albuquerque, NM	Olympic Medical Physicians Orthopaedic Clinic, Port Angeles, WA
Vivek Natarajan	Pediatrics - Childrens Hospital of Pittsburgh, PA	Advocate – The Orthopaedic Center, Cedar Knolls, NJ
John Seddon	Foot & Ankle - Melbourne Orthopedic Group, Melbourne, Vic, Australia	UC Health Orthopaedics Clinic, Colorado Springs, CO
2014		
Zachary B. Domont	Sports Medicine - Univ. of Pennsylvania, Philadelphia, PA	AMG-Lincolnshire Orthopedics, Lincolnshire, IL
Jia-Wei Kevin Ko	Shoulder & Elbow - Rothman Institute, Thomas Jefferson Univ., Philadelphia, PA	Orthopedic Physician Associates, Seattle, WA
Trevor C. McIver	Spine - Spine Institute of Arizona, Scottsdale, AZ	St. Cloud Orthopedics, Sartell, MN
Richard J. Myers	Orthopaedic Trauma - Univ. of Maryland, College Park, MD	Sentara Orthopedic Trauma Specialists, Norfolk, VA
Brent M. Roster	Foot & Ankle - Univ. of California Davis Medical Center, Sacramento, CA	Missoula Bone and Joint Clinic, Missoula, MT
2013		
Adam P. Baker	Foot & Ankle - Northwest Orthopedic Specialists, Portland, OR	Kaiser Permanente, Portland, OR
Michael Kuhne	Trauma Orthopedics - Univ. of California, San Francisco General Hospital, San Francisco, CA	Enloe Medical Center, Chico, CA
Laura J. Matsen Ko	Adult Reconstruction - Thomas Jefferson Univ., Philadelphia, PA	Orthopedic Physician Associates, Seattle, WA
Jacqueline Brady (Munch)	Shoulder Surgery, Sports Medicine - Hospital for Special Surgery, New York, NY	Oregon Health & Science Univ., Portland, OR
Daniel C. Wieking	Foot & Ankle - Melbourne Orthopaedics, Melbourne Australia	Asante Physician Partners, Grants Pass, OR

OHSU Orthopaedic Program Alumni Directory

GRADUATE		FELLOWSHIP TRAINING	CURRENT PRACTICE LOCATION
2012			
Dawson S. Brown	Sports Medicine - Southern California Orthopedic Institute, Van Nuys, CA		West Sound Orthopedics, Silverdale, WA
Peter D. Fredericks	Trauma Orthopedics - Indiana Orthopaedic Hospital, Indianapolis, IN		UCHealth Orthopaedics Clinic, Colorado Springs, CO
Matthew D. McElvany	Shoulder & Elbow - Univ. of Washington Medical Center, Seattle, WA		Kaiser Permanente, Santa Rosa, CA
Cuchulain Luke Rust	Foot & Ankle - Orthopaedic Associates of Michigan, Grand Rapids, MI		Rebound Orthopedics, Vancouver, WA
2011			
Matthew J. Harrison	Foot & Ankle - Oakland Bone & Joint Specialist Clinic, Oakland CA; Middlemore Hospital, Auckland, New Zealand		Alta Orthopedics, Santa Barbara, CA
Jayne R. Hiratzka	Spine Surgery - Univ. of Utah, Salt Lake City, UT		Oregon Health & Science Univ., Portland, OR
Jackson B. Jones	Adult Reconstruction - Harvard Medical School's Brigham and Women's Hospital, Boston, MA		Reno Orthopedic Clinic, Reno, NV
2010			
Matthew W. Bradley			Orthopedic Sports Medicine & Spine Care Institute, St. Louis, MO
Gregory D. Byrd	Hand - Beth Israel Deaconess Medical Center, Boston, MA		Olympia Orthopedics, Olympia, WA
Adam E. Cabalo	Spine - Spine Care Medical Group, Daly City, CA		Southern Oregon Orthopedics, Medford, OR
Patrick J. Denard	Shoulder - Centre Orthopédique Santy, Lyon, France and San Antonio Orthopaedic Group, San Antonio, TX		Southern Oregon Orthopedics, Medford, OR
Gary Kegel	Hand - St Luke's-Roosevelt Hospital Center, New York, NY		Group Health Capital Hill Medical Center, Seattle, WA
2009			
Stephen L. Pro	Sports Medicine - Santa Monica Orthopaedic and Sports Medicine Group, Santa Monica, CA		Ortho Kansas, Lawrence, KS
Khalid Shirzad	Foot & Ankle - Duke Univ. School of Medicine, Durham, NC		Northwest Orthopedic Specialist, Spokane, WA
Abner M. Ward	Hand - SUNY Stony Brook Univ. Hospital & Medical Center, Stony Brook, NY; and Sports Medicine - Southern CA Center for Sports Medicine, Long Beach, CA; and Shoulder & Elbow - Alps Surgery Institute, Annecy, France; and Shoulder & Elbow - Schulthess Klinik, Zurich, Switzerland		Yosemite Bone and Joint, Inc., Merced, CA and Turlock, CA
2008			
Kate B. Deisseroth			VA Medical Center, Lebanon, PA
Andy J. Kranenburg	Surgery and Trauma - San Francisco Spine Institute, San Francisco, CA		Southern Oregon Orthopedics, Medford, OR
Kenna Larsen	Hand - Univ. of New Mexico, Albuquerque, NM		Utah Orthopaedics, Ogden, UT
2007			
William Magee	Sports Medicine - TRIA Orthopaedic Center, Park Nicollet Methodist Hospital, Minneapolis, MN		Rockwood Clinics, Spokane, WA
J. Rafe Sales	Spine - San Francisco Spine Institute, San Francisco, CA		Summit Spine, Portland, OR
Joseph Schenck	Sports Medicine - Perth Orthopaedic Sports Medicine Center, Perth, Australia and Arthroscopic Surgery and Computer Navigated Total Joint Arthroplasty - Sir Charles Gairdner Hospital, Nedlands, Western Australia		Orthopedic & Sports Medicine, Portland, OR
Robert L. Tatsumi	Spine - LA Spine Institute, Santa Monica, CA		Oregon Spine Care, Tualatin, OR
2006			
Catherine A. Humphrey	Trauma - Vanderbilt Univ. Medical Center, Nashville, TN		Univ. of Rochester Medical Center, Rochester, NY
Amer J. Mirza	Trauma - Harborview Medical Center, Seattle, WA		Summit Orthopaedics, LLP, Portland, OR
Mark B. Wagner			Orthopedics NW, Tigard, OR

OHSU Orthopaedic Program Alumni Directory

GRADUATE		FELLOWSHIP TRAINING	CURRENT PRACTICE LOCATION
2005			
Patrick A. Dawson	Upper Extremity and Sports Medicine - Congress Medical Associates, Pasadena, CA		Cascade Orthopaedic Group, Tualatin, OR
Suresh Kasaraneni			Scott Memorial Hospital, Scottsburg, IN
Christopher M. Untch	Surgical Services - Davis Monthan AFB, Tucson, AZ		Arizona Orthopedics, Tucson, AZ
Corey J. Vande Zandschulp	Trauma - OrthoIndy, Methodist Hospital, Indianapolis, IN		Summit Orthopaedics, LLP, Portland, OR
2004			
Benjamin C. Kam			Medical Center Point, Colorado Springs, CO
Britton Frome (Polzin)	Hand Surgery - UT Southwestern, Dallas, TX		Colorado Springs Health Partners, Colorado Springs, CO
2003			
Jennifer R. Miller	Sports Medicine - Congress Medical Associates, Pasadena, CA		Idaho Sports Medicine Institute, Boise, ID
John B. Reid	Sports Medicine - Taos Orthopaedic Institute, Taos, NM		Taos Orthopaedic Institute, Taos, NM
Eric F. Shepherd	Trauma - UC Davis Medical Center, and Auckland City Hospital, NZ		Santa Barbara Orthopedic Associates, Santa Barbara, CA
2002			
Michael A. Binnette	Spine - Univ. of Washington, Seattle, WA		OA Center for Orthopaedics, Portland, ME
Kevin M. Kahn	Trauma - Universitatsspital, Zurich Switzerland, Vanderbilt Orthopaedic Inst., Nashville, TN		Rebound Orthopedics & Neurosurgery, Vancouver, WA
Tamara S. Simpson	Trauma - UCSF - Sports Medicine; Hennepin Medical Center, Minneapolis, MN		Cascade Orthopaedic Group, Tualatin, OR
2001			
Michael J. Gustavel	Sports Medicine - San Diego Sports Medicine and Orthopaedic Center, San Diego, CA		Idaho Sports Medicine Institute, Boise, ID
James B. Hayden	Musculoskeletal Oncology - Massachusetts General Hospital, Boston, MA		Oregon Health & Science Univ., Portland, OR
Todd W. Ulmer	Sports Medicine - Univ. of Washington, Seattle, WA		Columbia Orthopedic Associates, Portland, OR
2000			
Mark S. Metzger	Joint, Spine & Tumor - Harvard Medical School, Boston, MA		
Lorenzo L. Pacelli	Hand & Microvascular Surgery - Hand Center, San Antonio, TX		Scripps Clinic Torrey Pines, La Jolla, CA
Edward A. Perez	Trauma - R. Adams Cowley Shock Trauma Center, Baltimore, MD		Campbell Clinic Orthopaedics, Germantown, TN
1999			
Anthony I. Colorito	Sports Medicine - Cincinnati Sports Medicine and Orthopedic, Cincinnati, OH		Orthopedic & Sports Medicine, Portland, OR
John M. Kioschos	Shoulder and Elbow Surgery - Florida Orthopaedic Institute, Tampa, FL		Tri Star Skyline Medical Center, Nashville, TN
Jill A. Rider-Graves			
1998			
John D. Curtis			Dory Orthopaedics, Uab Medical West, Bessemer, AL
Darrin F. Eakins	Sports Medicine and Knee - Royal N Shore Hospital, Sydney, Australia		Ortho Wilmington, Wilmington, NC
Ronald D. Wobig	Sports Medicine and Knee - Louisiana State Univ., Lake Charles, LA		Beaver Sports Medicine, Corvallis, OR
1997			
Dennis J. Davin			
Kevin M. Lee			Upper Valley Orthopedics, Rexburg, ID
Ronald L. Teed			Cascade Orthopedic Surgery, Hillsboro, OR

OHSU Orthopaedic Program Alumni Directory

GRADUATE	FELLOWSHIP TRAINING	CURRENT PRACTICE LOCATION
1996		
Knut C. Buehler	Lower Extremity Reconstruction - Scripps Clinic and Research Foundation, San Diego, CA	Center Orthopedic & Neurosurgical Care & Research, Bend, OR
Thomas J. Croy		310 Villa Road, Ste 108, Newberg, OR
Marc R. Davidson	Sports Medicine - The Hughston Clinic, Columbus, GA	Advantage Orthopedic and Sports Medicine Clinic, LLP, Gresham, OR
1995		
Douglas R. Bagge		Cortez Orthopedics, Cortez, CO
Robert A. Foster	Hand and Microvascular Surgery - Univ. of Minnesota, MN	Texas Orthopedics Sports and Rehabilitation Association, Austin, TX
Gregory A. Voit	Hand and Microvascular Surgery - Univ. of New Mexico Health Sciences Center, Albuquerque, NM	
1994		
Robert J. Grondel	Sports Medicine and Shoulder - Mississippi Orthopaedic & Sports Medicine Clinic; Trauma - Emanuel Hospital, Portland, OR	Orthopaedic Institute of Henderson, Henderson, NV
Allen L. Hershey	Lower Extremity Reconstruction - Scripps Clinic and Research Foundation, San Diego, CA	Precision Orthopedics and Sports Medicine, Salinas, CA
Brian J. Padrta	Foot and Ankle - Florida Orthopaedic Institute, Univ. of South Florida, Tampa, FL	Northwest Orthopaedic Specialists, Spokane, WA
Mark R. Rangitsch		Cheyenne Orthopaedics LLP, Cheyenne, WY
1993		
Blaine A. Markee		
Dean K. Olsen		Park Nicollet Orthopaedics, Burnsville, MN
Andrew H. Schmidt	Adult Reconstruction, Shoulder Surgery, Trauma - Hennepin County Medical Center, Minneapolis, MN	Hennepin County Medical Center, Minneapolis, MN
1992		
Edward C. Pino	Sports Medicine - Cincinnati Sports Medicine, Cincinnati, OH; Foot & Ankle - Michigan Internat. Foot and Ankle Center, Detroit, MI	Kaiser Permanente, Denver, CO
Stephen S. Tower		Anchorage Fracture & Orthopedic Clinic, Anchorage, AK
Michael R. Van Allen	Hand and Microsurgery - Univ. of Alabama, Birmingham, AL	Legacy Meridian Park Medical Center, Tualatin, OR
1991		
Ronald R. Bowman		Tigard Orthopedic & Fracture Clinic, Portland, OR
William H. Dickinson		
Richard A. Rubinstein	Methodist Sports Medicine Center, Indianapolis, IN	Providence Portland Medical Center, Portland Knee Clinic, Portland, OR
1990		
Gregory T. Bigler	Sports Medicine and Arthroscopy - Harvard Medical School, Massachusetts General Hospital, Boston, MA	Thomas & Bigler Knee and Shoulder Institute, Las Vegas, NV
Adrian B. Ryan		Anchorage Fracture & Orthopedic Clinic, Anchorage, AK
Theodore S. Woll	Foot and Ankle - Univ. of Washington, Seattle, WA	Rebound Orthopaedics, Vancouver, WA
1989		
James R. Hazel		Tri-City Orthopaedics, Kennewick, WA
Asa E. Stockton		Eureka Community Health Center, Eureka Open Door, Eureka, CA
Keith J. Ure	Joint Replacement - Joint Replacement Institute, Orthopaedic Hospital, Los Angeles, CA	Olympic Medical Center, Sequim, WA
Robert G. Zirschky		Hope Orthopedics of Oregon, Salem, OR

OHSU Orthopaedic Program Alumni Directory

GRADUATE	FELLOWSHIP TRAINING	CURRENT PRACTICE LOCATION
1988		
John D. DiPaola		Occupational Orthopedics, Tualatin, OR
Jeffrey E. Flemming	Texas Southwestern Medical Center - Texas Back Institute, Dallas, TX	Providence Portland Medical Center, Portland, OR
Morris Hughes		
Michael B. Wyman		Orthopedic Specialists, Portland, OR
1987		
Dale G. Bramlet	Orthopaedic & Plastic Surgery, Hand and Upper Extremity - Univ. of Rochester Medical Center, Rochester, NY	Advent Orthopedics, Pinellas Park, FL
Scott B. Jones		Orthopedic & Sports Medicine Center of Oregon, Portland, OR
Stefan D. Tarlow	Knee Surgery - Dr. Jan Gillquist, Sweden; Sport Medicine - Dr. James Andrews, Birmingham, AL	Advanced Knee Care, PC, Scottsdale, AZ
1986		
Mark J. Buehler	Hand - Duke Univ., Durham, NC	Providence Hospital, Portland, OR
Wendell D. Ferguson	Providence Medical Center, Portland, OR	Vallejo Kaiser Medical Center, Vallejo, CA
Paul A. Switlyk	Shoulder - Univ. of Western Ontario, London, ON	Orthopedic & Sports Medicine Center of Oregon, Portland, OR

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1985	1976	1968	1959	1947
Stanley J. Neitling	Wayne C. Kaesche	Benjamin F. Balme	Raymond A. Case	Edward A. LeBold
Daniel N. Ovadia	Walter A. Smith	James D. Kunzman	James V. Harber	
	Stephen J. Thomas	James D. Nelson		1946
1984	1975	1967	1958	William P. Horton
Steven J. Bruce	Randy W. Crenshaw	Michael S. Baskin	Richard G. Gardner	Clyde D. Platner
Kenneth A. Hermens	John O. Hayhurst	John W. Gilsdorf	William D. Guyer	Faulkner A. Short
Wendy M. Hughes	Patrick T. Keenan	John W. Thompson		
	Kelsey C. Peterson		1957	1945
1983	Ned R. Schroeder	1966	Hadley F. Fitch	Joseph H. Gill
Michael J. Grundy		Charles A. Bonnett	Richard S. Gilbert	
Paul J. Mills	1974	McGregor L. Church	1956	1943
John C. Schwartz	Thomas W. Hutchinson	Don D'Amico	William E. Hummel	Paul G. Hafner
	Robert J. Porter	Fred G. Grewe	Joseph R. McProuty	1942
1982	Frederick L. Surbaugh	Howard E. Johnson	Jack B. Watkins	Rodney Begg
Julie Isaacson				Harold E. Davis
James D. Livermore	1973	1965	1955	
John S. Toohey	James L. Baldwin	Arthur L. Eckhardt	Edward A. Attix	1940
	David A. Haaland	John Hazel	Max M. Bocek	Leslie S. Porter
1981	Craig MacCloskey	Richard L. Mercer		
Christopher A. Blake	1972	1964	1954	1938
Wayne K. Nadamoto	Michael S. Hmura	Robert F. Corrigan	Howard I. Popnoe	Arthur M. Compton
Samuel K. Tabet	Grant D. Lawton	Richard C. Zimmerman	Dale D. Popp	
	Michael R. Marble		1953	1935
1980	1971	1963	Donald D. Smith	E.G. Chuinard
Lenart C. Ceder	Charles B. Bird	Donn K. McIntosh		1931
Jonathan H. Hoppert	Robert G. Chuinard	Michael R. Rask	1952	Harry Leavitt
Robert W. Jordan	Jim Dineen		Melvin L. Makower	
	Ilmar O. Soot	1962	1951	1929
1979	1970	Phaen Gambée	Bob Maris	D.G. Leavitt
Brian Laycoe	Philip J. Fagan	Norman D. Logan	William E. Snell	
Donald Peterson	Robert J. Foster	Keith A. Taylor	James W. Weed	1928
James Robbins	Art Hauge			Leslie C. Mitchell
	Edwin A. Kayser	1961	1950	
1978	Gerald T. Lisac	Rodney K. Beals	Ralph Thompson	1925
Enoch D. Shaw	Ira M. Yount	Thomas A. Edwards		John LeCocq
		George Keyes	1949	
1977	1969	Ralph E. Peterson	Howard Cherry	1924
David L. Noall	Thomas E. Fagan		Boyd G. Holbrook	Leo S. Lucas
Byron K. Skubi	Michael H. Graham	1960	Richard J. Hopkins	
Robert K. Smith	George W. Ingham	Charles A. Fagan		
Theodore J. Vigeland	Joseph P. Klein	Calvin H. Kiest	1948	
	Scott Struckman	Betty J. Hohmann	Robert F. Anderson	
		Robert W. Straumfjord	George W. Cottrell	
		Bud Yost	Carl L. Holm	

Special Thanks

The Department of Orthopaedics and Rehabilitation at OHSU thank the following for their generous donations to our department.

\$50,000 and above

Dr. John Hayhurst
Dr. Kenneth Martin

\$10,000 - \$50,000

Dr. Bryan Laycoe
Joint Restoration Foundation, Inc.

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Mrs. Deborah Teeny
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Ms. Beverly Downer
Dr. Darin Friess
Dr. Thomas Hutchinson
Dr. Benjamin Kam
Mr. William Kirtley
Ms. Carolyn Lamborghini
Dr. Richard Rubinstein

In Addition

The Beals family continues their generosity to our department with contributions in the name of Dr. Rodney Beals, and in their estate plans as an eventual beneficiary. The history of our department and orthopaedics in Oregon State would not be the same without the significant contributions of Dr. Beals, and the Beals family contributions are vital to keeping Dr. Beals hopes for Oregon Orthopaedics alive.

Marie Kane, Technical Writer

The editors would like to thank Marie Kane for all of her support to make this journal a reality. She is responsible for arranging and editing the journal and attempting to keep the residents on schedule. Without her expertise and tireless work this journal would not be what it is today and for that we are grateful.

Robin Sasaoka, Education Manager

A special thanks to our Education Manager, Robin Sasaoka. She is an invaluable resource for residents as they progress through OHSU. She is always available to assist with any questions or concerns in addition to her role of organizing resident education, schedules, vacations, and assisting with financial matters.

The goal of this publication is to grow and mature over the next several years. We would love any input from our alumni and local community on ways to improve the journal.

If you are an alumni and your information has changed with regard to your current practice type and/or practice location, please contact us so that your information can be updated for next year's journal.

Department of Orthopaedics & Rehabilitation

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Please Consider Supporting the OHSU Department of Orthopaedics and Rehabilitation

You can make a significant impact on our ability to train the next generation of specialists, advance patient care, and develop new knowledge through research. We are building on a legacy of excellence that spans Richard Dillehunt, M.D., and Leo Lucas, M.D., to Lawrence Noall, M.D., and Rodney Beals, M.D., to our current department chair, Jung Yoo, M.D. Your personal gift is a vital part of this legacy and will help us advance the future of Orthopaedics.

Please make your gift to the Department of Orthopaedics and Rehabilitation by donating to one or more of the fund areas below. Each provides crucial and strategic resources for our educational, training and research missions.

Rodney K. Beals, M.D. Endowment for Faculty Excellence in Orthopaedics & Rehabilitation

Supports innovative and mission-focused work of exceptional faculty members. This fund honors Dr. Beals' legacy while enabling faculty to explore new horizons to advance the field of Orthopaedics.

Lawrence Noall, M.D. Fund for Excellence in Orthopaedic Resident Education

Supports resident education and training.

Orthopaedic Research Endowment

Provides essential support for basic science research in the field of Orthopaedics.

OHSU Department of Orthopaedics & Rehabilitation Support Fund

Making a gift to this fund is one of the best ways to advance the education, training and research missions of the department. It is often used to capitalize on unique opportunities and provide crucial bridge funding for innovative projects.

Please contact us if you to discuss these and other giving opportunities, or if you have (or plan to) include the OHSU Department of Orthopaedics and Rehabilitation in your estate plans.

Ways to Give

The OHSU Department of Orthopaedics and Rehabilitation gratefully accepts outright gifts or pledges, as well as deferred or planned gifts.

Outright gifts and pledges: You can make an outright gift of cash or certain other assets with the option of making your gift as a pledge over a period of up to five years.

Planned or deferred gifts: A gift made through your will or trust, retirement account or life insurance, allows you to support OHSU Orthopaedics and can often have financial and tax benefits to you and your heirs. The OHSU Foundation's gift planning professionals can also assist with gifts of real estate, stocks, bonds, gifts-in-kind and other marketable assets.



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