



2018

ORTHOPAEDICS

ANNUAL
REPORT

 WVU Medicine

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THE CHAIRMAN'S

WELCOME



Sanford E. Emery MD, MBA

Professor and Chairman
Department of Orthopaedics
Director of Surgical Services
West Virginia University

2018 was another strong year for the Department of Orthopaedics at West Virginia University! We have continued to recruit faculty in both the clinical and basic science areas.

Our pre-operative optimization program for total joint patients is driven by our two newer internal medicine physicians, Dr. Jami Pincavitch and Dr. Kate Kasicky. This program has taken off and we are expanding this to our spine patients, more details later in this report. We have also hired a fourth podiatrist who will anchor our new satellite outpatient facility that is just opening now in Waynesburg, PA. Dr. John Taras from Philadelphia, a very nationally known and experienced hand surgeon joined us this past April, a major benefit for the hand service and the residency program. We are working to add more physicians for our Division of Physical Medicine and Rehabilitation and have had some success there. Dr. Jonathan Boyd joined us from WVU Department of Chemistry in July 2018. Dr. Boyd's expertise is in cell signaling and apoptosis, which provides collaborative opportunity with our current research investigators.

Clinically we are busier than ever. Outpatient volumes continue to expand in double digits

and our surgical volume parallels this. We continue with outreach in Fairmont, Parkersburg, Charleston, and have now added Waynesburg, Uniontown, PA is on the institutional radar for outreach of some kind in the future.

Our total joint section again achieved the highest certification from the Joint Commission - earning the Joint Commission's Gold Seal of Approval® and receiving both the Advanced Certification and the Standard Certification for Total Hip and Total Knee Replacement. This total joint section is recognized as a Center of Excellence by Blue Cross Blue Shield as well. We also recently achieved designation as a 2020 Highmark BCBS Blue Distinction® Center for Spine Surgery. Additionally, our track record continues with another year as a US News & World Report "Star Performer" for the American Orthopaedic Association's "Own The Bone" program.

Please read on about some of our program highlights and research success. On a sad note, we mourn the passing of Dr. Jai Ryu this past January from complications related to his traumatic quadriplegia he sustained two years ago in an accident. We still miss him and our thoughts are with his wife, Youngee and his two sons, Jubin and Justin.

For alums or other visitors, please let us know if you are coming into town. I would love to touch base and give you a tour of the department!

Sanford E. Emery MD

FACULTY



CLINICAL AND RESEARCH



Sanford E. Emery MD, MBA
Chairman; Professor
Orthopaedics, Surgery



John C. France MD
Chief, Spine Service;
Professor and Vice Chairman



George K. Bal MD
Chief, Sports Medicine Service;
Associate Professor



Karen Barr MD
Chief, Associate Professor,
Physical Medicine and
Rehabilitation



Derik Geist MD
Assistant Professor, Orthopaedics,
Sports Medicine



Daniel Grant MD
Assistant Professor,
Pediatric Orthopaedics



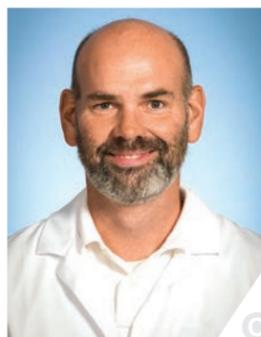
Natasha Harrison MD, MPP
Assistant Professor
Orthopaedics, Sports Medicine



Bethany Honce MD
Assistant Professor, Physical
Medicine and Rehabilitation



Kathryn Bosia DPM
Assistant Professor,
Orthopaedics



Jonathan Boyd PhD
Associate Professor,
Orthopaedics



Michelle A. Bramer MD
Assistant Professor,
Orthopaedic Trauma



Rusty Cain DPM
Assistant Professor,
Orthopaedics



David F. Hubbard MD
Chief, Orthopaedic Trauma Service;
Professor, Orthopaedics



Dina Jones PT, PhD
Professor Orthopaedics,
Human Performance - Physical
Therapy, WVU Injury Control
Research Center



**Cherie L.
Kelly-Danhires DPM**
Assistant Professor,
Orthopaedics



Kathryn Kasicky MD
Assistant Professor,
Orthopaedics, Internal
Medicine



Shari Cui MD
Assistant Professor,
Orthopaedics, Spine



Scott Daffner MD
Associate Professor,
Orthopaedics, Spine



Matthew Dietz MD
Assistant Professor,
Orthopaedics, Adult
Reconstruction



Benjamin Frye MD
Assistant Professor, Orthopaedics,
Adult Reconstruction, Director,
Adult Reconstruction Fellowship



Adam Klein MD
Assistant Professor,
Orthopaedics, Adult
Reconstruction



Andrea Lese MD
Assistant Professor,
Orthopaedics, Hand and
Upper Extremity



Bingyun Li PhD
Professor, Orthopaedics,
WVU Cancer Institute Research
Programs



Brock Lindsey MD
Chief, Adult Reconstruction;
Assistant Professor, Orthopaedics;
Director, Orthopaedic Research
Laboratory

FACULTY



CLINICAL AND RESEARCH



John P. Lubicky MD
Chief, Pediatric Orthopaedics;
Professor, Orthopaedics



David Lynch MD
Assistant Professor, Physical
Medicine and Rehabilitation



Barry McDonough MD
Associate Professor,
Orthopaedics, Sports Medicine



Benjamin Moorehead MD
Assistant Professor,
Orthopaedics, Sports Medicine



David Waxman MD
Associate Professor, Orthopaedics,
Adult Reconstruction

NEW FACULTY



T. Ryan Murphy MD
Assistant Professor, Orthopaedics,
Adult Reconstruction



Jami Pincavitch MD
Assistant Professor,
Orthopaedics, Internal Medicine



Ming Pei MD, PhD
Professor, Orthopaedics; Associate
Professor, Human Performance -
Exercise Physiology; WVU Cancer
Institute Research Programs



Joseph Prudhomme MD
Chief, Hand and Upper
Extremity; Associate
Professor, Orthopaedics



J. David Blaha MD
Professor, Orthopaedics



Richard Harris DPM
Assistant Professor,
Orthopaedics



Mary Louise Russell MD
Assistant Professor, Physical
Medicine and Rehabilitation



John Taras MD
Professor, Orthopaedics,
Hand and Upper Extremity



Robert Santrock MD
Chief, Foot and Ankle;
Associate Professor,
Orthopaedics



Shafic Sraj MD
Assistant Professor, Orthopaedics,
Hand and Upper Extremity



David Tager MD
Assistant Professor,
Pediatric Orthopaedics



Colleen Watkins MD
Associate Professor,
Orthopaedics, Rheumatology/
Metabolic Bone

DR. J. DAVID BLAHA — A REINTRODUCTION

As you may have noticed in our faculty line up, we have a familiar face from the past! Dr. David Blaha has rejoined our department as a Clinical Professor. As you may or may not know, Dr. Blaha was Chair of the Department of Orthopaedics here at WVU from 1991-2002. Dr. Blaha has

retired from clinical work, but will be re-joining us as part of our research program. He will be collaborating with our adult reconstruction section and working on long-term follow-up projects with joint replacement patients. Dr. Blaha developed a total knee many years ago that best mimicked the complex biomechanics of the knee. This prosthetic design has been successful and even increased in popularity as newer generation implants have been produced.

We are happy to have him back and we know he will be a great asset to our research efforts!

OUTREACH IN ACTION: WVU ORTHOPAEDICS SUPPORTS HOPITAL SACRE COURE IN HAITI

From the start of our trip to Hopital Sacre Coure in Milot, Haiti, located just a short distance from the island's second largest city, Cap Haitien, we were met with the devastating beauty of the islands along with the devastation that accompanies people living in abject poverty.

For years, the people of this Caribbean island have faced economic, social, and environmental upheaval. For many, they live with little hope. WVU alumnus Dr. Jack Steel has long-witnessed the challenges faced by Haiti's residents first-hand. Dr. Steel has been active with CRUDEM, a non-profit foundation providing weeklong medical trips to the area, for years.

In October of 2018, WVU Orthopaedics partnered with Dr. Steel to send a small team to provide services to those in need. Team members included myself, Daniel Grant, M.D., a pediatric orthopaedist; Rob Crowder, D.P.T., a physical therapist; and Roland Rizzi, M.D., an anesthesiologist.

Our trio spent the week working alongside Dr. Pierre Ogedad, a Haitian orthopaedic surgeon who practices in the local clinic. The clinic provides a lifeline to a population that would otherwise have minimal options.

We began our endeavors in the clinic and with the help of translators, we saw scores of patients who would arrive in the morning and were willing to wait all day if it meant they could be seen by the care team.

The pathology ranged from benign entities like in-toeing to major problems such as significant malunions, angular deformities, and sequela from untreated osteomyelitis. There was more to be done than we could ever hope to treat during our time there. We triaged our cases and set the schedule for the week.

The next day I ran a clubfoot clinic. The hospital has some individuals who do most of the casting for the children with clubfeet, so they brought over a dozen complicated cases. I spent the day casting and performing procedures on these kids.

The rest of the week was spent in the operating room with a few side trips to clinic. Based on our triage, we spent quite a bit of time taking care of fractures. No case was boring. Even simple forearm fractures were complicated by finding plates that fit the fractures, drills sharp enough to go through the bone, or properly sized screws. We adapted and made do with what we had, which was usually more than adequate.

One of the biggest deficiencies in this region of the country is the availability of blood for transfusions. We treated an adult with a three-week old femur fracture definitively with an external fixator due a lack of blood availability and the patient's degree of anemia.

One of the most challenging cases for our team was a seven-year-old male, with chronic osteomyelitis of the femur. The child was ill, anemic, and had a swollen, painful leg with a bone being destroyed by an infection. Coordinating blood for surgery and antibiotics postoperatively was a massive undertaking. We were able to take the child to surgery to remove the purulence and much of the sequestrum which was essentially the entire diaphyseal femur. The child did well. Though, the difficulty of providing adequate treatment to this child and the potential life-

long implications of this infection are staggering when you compare him to a child with the same initial problem in the United States.

The trip was an extremely rewarding experience. It was an opportunity to provide desperately needed care to a friendly and wonderful group of people. It helped reinforce my appreciation for living in a developed country and working in facility like WVU.

The WVU Orthopaedic Department plans to continue this partnership with Haiti and Dr. Jack Steel. We hope to be able to include residents in some of our future trips so that they can share in this experience.

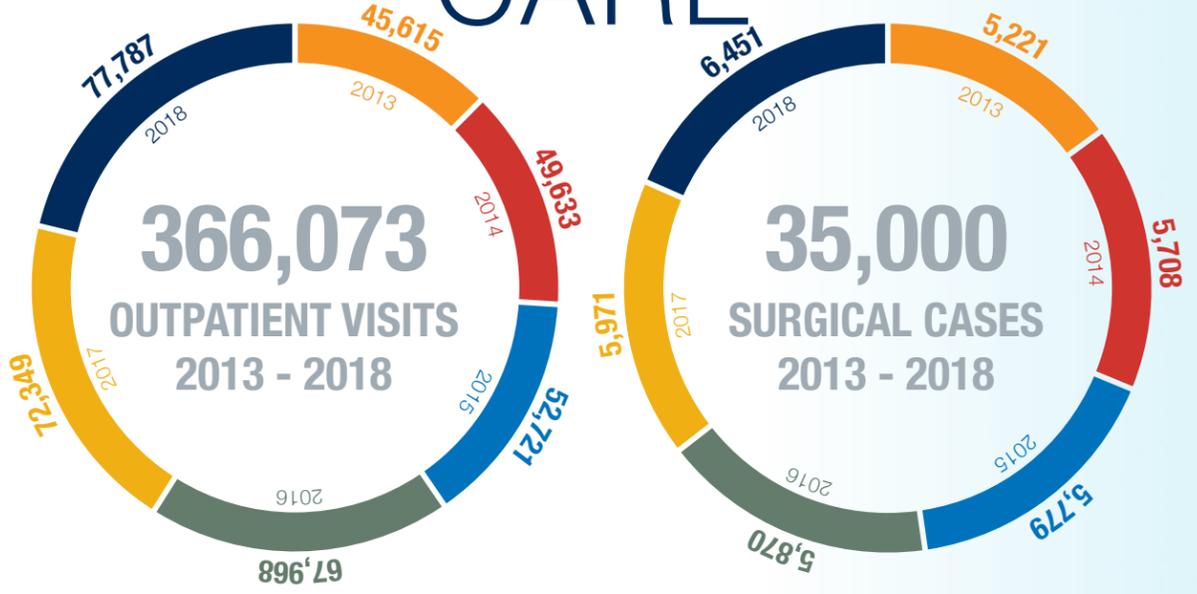
Daniel Grant, M.D.
WVU Pediatric Orthopaedics



PATIENT

+ PEDIATRIC ORTHOPAEDICS

CARE



Orthopaedics Clinics
 We have two conveniently located clinics in Morgantown and Fairmont. The Morgantown location is in the Physician Office Center, attached to J.W. Ruby Memorial Hospital. The Fairmont location is housed in our WVU Medicine Outpatient Center, directly across from the I-79 Downtown Fairmont exit.

University Town Centre
 University Town Centre is the home for several of our Orthopaedic centers, including the Center for Joint Replacement, the WVU Sports Medicine Center, and the Orthopaedics Hand Clinic. WVU Medicine University Town Centre is conveniently located in the University Town Centre development just off I-79 in Granville. This spacious center offers patients access to their favorite primary care providers.

Center For Joint Replacement At WVU Medicine
 The Center for Joint Replacement at WVU Medicine offers patients a comprehensive planned course of treatment. We believe our patients play a key role in ensuring a successful recovery. Our goal is to involve our patients in their treatment through each step of the program.

WVU Medicine Sports Medicine Center
 WVU's Sports Medicine Center cares for athletes of all levels. We work to get all patients back to their highest level of activity possible. Our physicians manage sports-related injuries and medical conditions that include muscle and joint pain, sprains, and concussions. The WVU Sports Medicine Center has access to specialists from multiple disciplines, including Orthopaedics and experts from the WVU Spine Center. Individuals with sports injuries have same-day access to our services, which are available around the clock, seven days a week.

WVU Spine Center
 The WVU Spine Center brings specialists together with a multidisciplinary team approach to provide our patients with comprehensive spinal care. We use a full range of treatment options to ensure that patients with spine problems get the treatment they need quickly, efficiently, and easily. The Spine Center combines the expertise of WVU neurologists, orthopaedic specialists, neurosurgeons, pain management physicians, and rehabilitation services to target every patient's particular problem and provide optimal treatment.

John Lubicky, M.D., chief of pediatric orthopaedics at WVU Medicine Children's, has performed the state's first robotic pediatric spinal surgery. The procedure was performed to treat neurofibromatosis, a genetic disorder that causes tumors to form on nerve tissue, and correct severe scoliosis, a sideways curvature of the spine.

Dr. Lubicky used the Mazor X robotic surgical guidance system to perform the procedure. This robot is programmed with pre-operative imaging, which allows it to accurately identify and access critical parts of the anatomy and safely insert implants into the vertebrae.

"The use of the robot allows us to navigate challenging or abnormal anatomy that would make the traditional freehand approach extremely difficult and maybe even risky," Lubicky said. "We were able to load a pre-operative CT scan into the robot to help us safely navigate the patient's anatomy to insert the screws and allow completion of a very difficult operation."

The use of surgical robots is increasing at WVU Medicine, allowing surgeons to perform surgeries that would be more dangerous, invasive, or complicated using traditional methods.

"WVU Medicine Children's has the capability of managing very severe spinal deformities in the safest way possible," Lubicky said. "In this case, it would have been impossible to safely place the pedicle screws that anchor the rods to stabilize the patient's spine."

The patient is recovering well and is mobile.

"The use of the robot allows us to navigate challenging or abnormal anatomy that would make the traditional freehand approach extremely difficult and maybe even risky."



John P. Kubicky, MD
 Chief, Pediatric Orthopaedics

WVU MEDICINE, OPERATION WALK PROVIDE LIFE-CHANGING JOINT REPLACEMENTS

Each December, a few patients at WVU Medicine receive a life-changing gift: a free hip or knee replacement.

Cynthia Lawrence, 60, of Lost Creek, has always been active and enjoys taking walks with her husband, being outside, and working in her yard.

When her hip started to hurt in May 2017, the pain slowed her down and kept her from doing the things she enjoyed. She had persistent nausea and noticed that her hands had started to swell.

“I went to my doctor at United Hospital Center, and he did a scan, but it didn’t show anything that was wrong,” Lawrence said. “I didn’t have insurance, so I was just trying to do this stuff on my own. I was paying for my medical bills as I made the appointments.”

Lawrence’s doctor gave her cortisone shots in her knee to try to alleviate her pain, but they were ineffective. A friend who works in physical therapy gave her a discounted rate so she could exercise in the pool, but even that hurt. The staff encouraged her to ask her doctor for scans, but she was reluctant because she did not have insurance.

Benjamin Frye, M.D., WVU Medicine orthopaedic surgeon and Operation Walk coordinator, patient **Cynthia Lawrence**, and **Cynthia Drummond**, R.N., B.S.N., WVU Medicine orthopaedic nurse clinician.

“I borrowed a walker from a friend so I could get around, but I still had pain down the front of my leg and in my hip,” Lawrence said. “I went to a chiropractor, who gave me some exercises to do, but they hurt more than walking in the pool.”

Despite her efforts, her hip pain only intensified. She knew that something was wrong and asked her doctor for an MRI, which showed that she had severe hip joint degeneration. She met with

HIP REPLACEMENT



Brock Lindsey, M.D., an orthopaedic surgeon at WVU Medicine, who saw that Lawrence was in great need of a hip replacement.

A nurse encouraged Lawrence to apply for a hip replacement through Operation Walk, an organization whose mission is to encourage and enable joint replacement surgeons to restore mobility and improve quality of life for uninsured patients who suffer from disabling arthritis of the hip or knee in the United States.

“I still didn’t have insurance at that point, but I thought it was worth checking into,” Lawrence said. “Next thing I knew, I got a call that I had been approved for a hip replacement through Operation Walk.”

In December 2017, Lawrence started the process of preparing for surgery. Her hip pain was still causing her nausea, and she had lost nearly 40 pounds. She followed an exercise regimen to strengthen the muscles around her hip so she would be able to recover successfully.

“After my surgery, they came in and said that it was time to get up and walk,” Lawrence said. “When I took that first step, my pain was gone. It was wonderful. It was absolutely wonderful.”

Now, Lawrence said she can keep up with her grandchildren more without worrying about pain or having to use a walker.

“I gave that back to my friend,” she said. “I’m so glad I don’t have to use that anymore. I am pain free.”

Lawrence said her medical team provided support and answers to all of her questions through MyWVUChart or over the phone through the entire process.

“No one even flinched when I had questions or concerns. They were all there for me and ready to get this done,” Lawrence said. “I love Dr. Lindsey. He’s just a sweet guy. I have a friend who told me about even more of the incredible things he does to help people. You don’t hear that often, how much they go above and beyond to help their patients.”

“When I took that first step, my pain was gone. It was wonderful. It was absolutely wonderful.”

Cynthia Lawrence, patient

For more information on the criteria for joint replacement through Operation Walk USA, contact Cynthia Drummond, R.N., B.S.N., WVU Medicine orthopaedic nurse clinician, at 304-598-6720 or drummondcy@wvumedicine.org. To register as a prospective patient, visit <http://operationwalkusa.org/patients/>.

PATIENT CARE

HAND DIVISION SEES CONTINUED GROWTH

Continuing with the upward trajectory of the WVU Department of Orthopaedics as a whole, the Division of Hand and Upper Extremity continues to expand, growing from two surgeons in 2015 to a total four surgeons in 2019.

In addition to our usual high volume of trauma and infections, the Division also augmented the use of an outpatient procedure room at the University Town Center. Several specially trained techs assist in the procedures, which range from straightforward cases such as carpal tunnel and trigger finger releases to more complex procedures.

WALANT Technique

Dr. Shafic Sraj is perfecting the WALANT technique for his surgeries. The effective use of the procedure room has been helpful to unload our busy hospital operating room. It also gives qualified patients a more efficient way to get these procedures done.

The number of procedures performed in the procedure room has risen steadily in the past few years, from 64 total procedures in 2016, to 100 procedures in 2018. At the six-month mark in 2019, with just half of the year over, surgeons have performed 75 cases to date.

WALANT Technique

Wide Awake
Local Anesthesia
No Tourniquet

Arrivals and Departures

The Division welcomed the addition of an experienced and accomplished colleague, Dr. John Taras.

Unfortunately, we had to bid farewell to our long-time colleague Dr. Jaiyoung Ryu, who succumbed to complications from a devastating injury earlier this year.

PATIENT CARE

ORTHOPAEDIC MEDICAL OPTIMIZATION PROGRAM

In October of 2018, the Orthopaedic Medical Optimization Program was initiated at the WVU Center for Joint Replacement. The goal of the program is to ensure evidence-based best care practices, decrease variations in optimization, and provide recommendations and co-management specifically directed towards medical management of total joint arthroplasty patients. Thus far, more than 500 patients have obtained pre-operative care through the Clinic.

Surgeons make referrals to the Orthopaedic Medical Optimization Clinic once adult reconstructive surgery is anticipated. The goal is to provide same-day appointments for patients' convenience, especially given that many WVU patients travel from a significant distance.

For patients with ongoing medical problems, the care team helps patients achieve necessary health care targets prior to scheduling elective surgery to help decrease surgical complications in addition to preventing last minute surgical case cancellations.

Previously, patients were responsible for obtaining pre-operative testing and consultant care through their primary providers. For some patients this meant potentially having to find a primary care provider to perform pre-operative evaluation, resulting in extra travel and difficulty

in obtaining all necessary documentation, delays in surgical scheduling, missed opportunities for improved pre-operative control of medical comorbidities, and same-day surgical case cancellations. With OMOP, the physicians within the program navigate the patient's through this process, ensuring all pertinent medical concerns are addressed.

One objective of the program is to ensure communication is maintained between the internist and orthopedic surgeon regarding medical risks and planned interventions. With ongoing medical care throughout the surgical process, perioperative risks are reduced and there is improved integration of the patient's care. By all accounts, the OMOP Clinic has been a great success.

The current care team consists of two Internists in conjunction with Adult Reconstructive Surgeons. The team is expected to grow in both size and services in the upcoming year.



Jami Pincavitch MD

Assistant Professor,
Orthopaedics,
Internal Medicine



Kathryn Kasicky MD

Assistant Professor,
Orthopaedics,
Internal Medicine

RESIDENCY PROGRAM

The WVU Orthopaedic Surgery Residency program had another successful academic year in 2018-2019. The residents continue to receive excellent training in each of the orthopaedic subspecialties at Ruby Memorial Hospital.

Continued excellence in education and facilities
Orthopaedics welcomed four new interns who began with a month-long orthopaedic skills training that emphasized fundamentals in splinting, casting, x-ray interpretation, orthopaedic emergencies and basic surgical skills.

WVU residents are immersed in multifaceted educational opportunities at top-notch facilities including the cadaver dissection and arthroscopy labs. A newly renovated Resident Room offers a 70-inch television for Chief's conference and other presentations.

Resident research efforts continue to be an important aspect of the program, with residents presenting their work at multiple national and regional conferences. Additionally, they continue to mentor other medical professionals through casting and splinting workshops, medical student lectures and anatomy labs.

A culture of community
Continuing with the University's push for work-life balance, the residents participated in many extra-curricular activities. The resident softball team "Extremity Pain" had another mediocre season this year with Joshua Russell at the mound, and are looking forward to bringing in a fresh pitcher next year to improve their chances at a title. Residents enjoyed multiple faculty sponsored gatherings including a "Bourbon and Sauce" party at Dr. Dietz's house, 4th of July party at Dr. Emery's, and football tailgate parties hosted by Dr. Santrock. The



annual golf tournament was a success once again, and we are happy to report there were no injuries this year. The residency program at WVU continues to be family-friendly, and two residents welcomed new babies this year.

Fellowship news
The Chief Resident Class all attained competitive fellowships this year — Kevin Shepet (Vanderbilt University – Sports), Joshua Russell (Baylor University – Sports), and Jon Karnes (University of Wisconsin – Spine). WVU is proud of the Chief Class and wishes them the best of luck as they begin fellowship and start their practice in orthopaedic surgery.

Arrivals and departures
As we say goodbye to the outgoing chiefs, we welcome a new intern class. The Class of 2024-2025 includes Eric Niemann (WVU), Ben Giertych (University of Wisconsin), Michael Booth (State University of New York), Keenan Atwood (US Air Force Flight Surgeon).

In 2019, the Department also welcomed a new program director, Dr. Barry McDonough, and a new assistant program director, Dr. Michele Bramer. The 2018-2019 academic year has been a very successful one for the WVU Department of Orthopaedics. As WVU continues to train competent and conscientious orthopaedic surgeons, we look forward to what the 2019-2020 academic year has in store.

RESIDENCY PROGRAM

+ GRADUATES AND CURRENT RESIDENTS



Jonathan Karnes MD
SOM: Ohio State University
Fellowship: University of Wisconsin, Spine



Joshua Russell MD
SOM: University of Texas, San Antonio
Fellowship: Baylor/SAOG Sports Medicine



Kevin Shepet MD
SOM: University of Wisconsin
Fellowship: Vanderbilt University, Orthopaedic Sports Medicine & Shoulder Surgery



Will Brooks MD
SOM: East Tennessee State University



Julie Glener MD
SOM: University of Central Florida



Jason Kinney MD
SOM: Augusta University



Justin Ray MD
SOM: East Carolina University



Phillip Bostian MD
SOM: East Carolina University
Fellowship: Indiana University, Adult Reconstruction



Mark Plumby MD
SOM: West Virginia University
Fellowship: Beacon Orthopedics and Sports Medicine, Cincinnati, OH



Daniel Shubert MD
SOM: Tufts University
Fellowship: San Diego Arthroscopy and Sports Medicine



Richard Wardell MD
SOM: University of Central Florida
Fellowship: University of New Mexico, Sports Medicine



Justin Vaida MD
SOM: University of Massachusetts



Patrick Luchini MD
SOM: West Virginia University



Eric Neumann MD
SOM: West Virginia University



Joshua Reside MD
SOM: University of Florida



Alex Conti MD
SOM: West Virginia University



Brian Grisez MD
SOM: West Virginia University



Danny Liechti MD
SOM: University of Illinois, Peoria



Lunden Ryan MD
SOM: West Virginia University



Taylor Shackelford MD
SOM: University of Kentucky



Keenan Atwood MD
SOM: Medical College of Wisconsin



Michael Booth MD
SOM: SUNY Upstate Medical University



Michael Niemann MD
SOM: West Virginia University



Benjamin Giertych MD
SOM: University of Wisconsin

RESIDENCY PROGRAM

RESIDENT RESEARCH YEAR PROVIDES DIVERSE, HANDS-ON OPPORTUNITIES

At West Virginia University, the Accreditation Council for Graduate Medical Education offers an accredited Orthopaedic Surgery research position each year. This position is a six-year track, compared to the traditional five-year categorical track. It is completed between the residents' first and second years.

During this time, residents have no hospital-based duties or call responsibilities, which provides them with the autonomy to establish and conduct their own research projects. They also have the opportunity to participate in ongoing studies alongside several faculty research members. The residents are expected to prepare grant submissions, oversee and manage studies, present poster and podium presentations, and submit peer-reviewed manuscripts.

Brock Lindsey, M.D., (Chief, Adult Reconstruction and Musculoskeletal Oncology), is the Director of the WVU Department of Orthopaedics Research Laboratory and advises lab residents during their research year. He, along with Matthew Dietz, M.D., (Adult Reconstruction), Ming Pei, M.D., Ph.D., Bingyun Li, Ph.D., and Jonathan Boyd, Ph.D., conduct the majority of the Department's basic science research with main focuses on

- nanotechnology,
- immunotherapy,
- tissue regeneration,
- oncology, and
- infection (biofilm).

The Department also has a very active clinical research focus with ongoing projects in every orthopaedic subspecialty.

The WVU Orthopaedic Research Laboratory is located on the fifth floor of the WVU Health Sciences Center adjacent to the main hospital campus. The 4,000-square-foot lab space contains state-of-the-art amenities capable of conducting basic science research with emphasis on tissue engineering, nanotechnology, cadaver and animal-based studies, and microsurgery.

The Research Resident also participates in daily resident education conferences, performs monthly cadaver dissection for anatomy conference, and occasionally provides lectures to students in the School of Medicine. The opportunities and experiences generated from this year are meant to serve as a foundation for a career as a research clinician.

INTERESTED IN LEARNING MORE?

Please contact:

Justin Vaida MD
at Justin.Vaida@hsc.wvu.edu
CURRENT RESEARCH RESIDENT

– OR –

Brock Lindsey MD
at blindsey@hsc.wvu.edu
ORTHOPAEDICS RESEARCH LABORATORY DIRECTOR



RESIDENCY PROGRAM

2017-2018 PRESENTATIONS AND AWARDS

Alex Conti MD 2021

• **Podium presentation:** Conti A. "Unipolar Osteochondral Allograft Transplantation of the Ankle for Post-Traumatic Tibial Necrosis: A Case Report."

Presented at: Orthopaedic Association 6th Annual Extremity Summit. 2018

Phillip Bostian MD 2020

• **Podium presentation:** Bostian PA, Murphy TR, Klein AE, Frye BM, Dietz MJ, Lindsey BA. "Nasal Decolonization with Alcohol Based Sanitizer is Effective at Preventing Surgical Site Infection Following Total Joint Arthroplasty."

Presented at:

- Southern Orthopaedic Association. Palm Beach, FL. 2018
- West Virginia Orthopaedic Society. Roanoke, WV. 2018

• **Podium presentation:** Bostian PA, Karolcik BM, Calkins TE, Bramer M, Wilson A, Dietz MJ. "Thromboelastography (TEG) is Predictive of Mortality, Blood Transfusion, and Blood Loss in Patients with Traumatic Pelvic Fractures."

Presented at: American Academy Orthopaedic Surgeons Annual Meeting. New Orleans, LA. 2018

• **Podium presentation:** Grisez BT, Karnes J, Bostian PA, Brown CA, Moushoush O, Dietz MJ. "Nutrition Status During Two-Stage Management of Prosthetic Joint Infection."

Presented at: American Academy Orthopaedic Surgeons Annual Meeting. New Orleans, LA. 2018

• **Poster presentation:** Bostian PA, Murphy TR, Klein AE, Frye BM, Dietz MJ, Lindsey BA. "Nasal Decolonization with Alcohol Based Sanitizer is Effective at Preventing Surgical Site Infection Following Total Joint Arthroplasty."

Presented at: American Academy Orthopaedic Surgeons Annual Meeting. New Orleans, LA. 2018

Justin Ray MD 2022

• **Podium presentation:** Ray JJ, Koay J, Dayton PD, Hatch DJ, Smith WB, and Santrock RD. "Multicenter Early Radiographic Outcomes of Triplanar Tarsometatarsal (TMT) Arthrodesis with Immediate Weight-Bearing."

Presented at: American Orthopaedic Foot and Ankle Society Annual Meeting. Boston, MA. 2018

• **Podium presentation:** Ray JJ, Koay J, Dayton PD, Hatch DJ, Smith WB, and Santrock RD. "Multicenter Early Radiographic Outcomes of Triplanar Modified Lapidus Arthrodesis with Immediate Weight-Bearing."

Presented at: The 7th Annual Extremity Summit. White Sulphur Springs, WV. 2018

• **Podium presentation:** Ray JJ, Koay J, and Santrock RD. "Early Clinical and Radiographic Outcomes of Triplanar Modified Lapidus Arthrodesis with Immediate Weight-Bearing."

Presented at: West Virginia Orthopaedic Society 2018 Spring Meeting. Roanoke, WV. 2018

• **Poster presentation:** Ray JJ, Koay J, and Santrock RD. "Early Clinical Outcomes of Triplanar Modified Lapidus Arthrodesis with Immediate Weight-Bearing."

Presented at: American Orthopaedic Foot and Ankle Society Annual Meeting. Boston, MA. 2018

Kevin Shepet MD 2019

• **Podium presentation:** McDonough E, Shepet, K, Bal G. "Use of the F.A.S.T. (Fundamentals of Arthroscopic Surgery Training) Program to Improve Arthroscopic Skills."

Presented at: West Virginia Orthopaedic Society Spring Meeting, Roanoke, WV. 2018

Daniel Shubert MD 2020

• **Podium presentation:** Shubert D, Shubert S. "Patient reported outcomes after shoulder surgery in a community orthopaedic practice: a 5-year Quality Improvement project using the QuickDASH questionnaire."

Presented at: OrthoCarolina Oscar Miller Day, Charlotte, NC. 2018

• **Podium presentation:** Shubert D, Prudhomme J, Sraj S. "Nerve Conduction Studies in Surgical Cubital Tunnel Patients."

Presented at:

- 73rd annual meeting of the American Society for Surgery of the Hand, Boston, MA. 2018
- Orthopaedic Association's 7th Annual Extremity Summit, White Sulphur Springs, WV. 2018

• **Poster presentation:** Shubert D, Prudhomme J, Sraj S. "Nerve Conduction Studies in Surgical Cubital Tunnel Patients."

Presented at: The American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, LA. 2018

Richard Wardell MD 2020

• **Podium presentation:** Wardell R, Hanselman A, Daffner S, Santrock R. "Posterior Tibialis Tendon Rupture in a Closed Bimalleolar-Equivalent Ankle Fracture: Case Report."

Presented at: 7th Annual Extremity Summit. White Sulphur Springs, WV. 2018

RESEARCH

Today, when there are endless streams of text messages, emails, electronic medical records and the term “burn-out” is pervasive through all walks of professional and personal life, it is easy to lose sight of where you have been and where are you going.

In the past year, the Musculoskeletal Research Lab in the Department of Orthopaedics has:

Published
23
PubMed cited
manuscripts

Presented at
27
national/
international
meetings
(podiums/posters/abstracts)

Been awarded
\$2.6m
dollars in grant
funding

Taking a step back from the countless revisions, rejections and impending grant deadlines, those numbers are impressive.

THE PAST

Most have a desire to become part of something bigger than themselves to help grow and develop something of which they can be proud. To have this type of success requires a foundation.

For our lab here in the Department of Orthopaedics, this foundation to grow, develop and expand began when the lab was located in the middle of the vivarium, on the ground floor of the WVU Health Sciences Center. It was in this space that Eric L. Radin, M.D., WVU Department of Orthopaedic Surgery Chair NIH-funded arthritis research, and Corrie Mancinelli, D.P.T., P.T., Ph.D., G.C.S., professor and assistant dean and director of WVU’s Physical Therapy Clinical Services, connected.

Mancinelli was a graduate student in the lab at the time, working alongside Dr. Radin and Tom Gruen, an adjunct associate professor (1993-2002), eponymously known for describing radiographic loosening of the femoral stem. The trio worked on one of the original Vicon Motion Analysis Systems.

Dr. Mancinelli feels fortunate to have worked with for department chair (1991-2002) J. David Blaha, M.D. Dr. Blaha acted as her primary mentor on her dissertation committee. Their work focused on kinematics of the knee and implant design providing the opportunity for many meetings, presentations and travel.

Dr. Blaha recently returned to the WVU Department of Orthopaedics as a visiting professor and to give a lecture entitled, “Have We Misinterpreted the Knee.” In this lecture, he highlighted some of the work done by himself and Dr. Mancinelli and the impact that work has had on current total knee designs.

In addition to bringing change to how some surgeons view knee replacements, their success also brought growth for the lab and, along with the addition of Jaiyoung Ryu, M.D. (1992-2018). The lab later secured space on the third floor of the Health Sciences Center South.

THE PRESENT

The research lab really began to grow in 2003 when Sanford Emery, M.D., M.B.A., was named chair. Dr. Emery joined WVU from Case Western University where he practiced alongside some of the world’s leaders in spine and translational research. Dr. Emery knew the importance of developing and supporting a research program within the department.

“To be a true academic Orthopaedic department, we needed a robust research program in both the clinical and translational arenas,” Dr. Emery said.

Dr. Emery hired three Ph.D. primary investigators: Dina Jones, Bingyun Li, and Ming Pei. This initial investment has paid dividends over the years as Dr. Pei’s work has led to nearly 100 publications focusing on using stem cells to regrow cartilage and intervertebral disc tissue.

“To be a true academic Orthopaedic department, we needed a robust research program in both the clinical and translational arenas.”

Sanford Emery, MD, MBA, department chair

Dr. Pei has explored the matrices and signals needed to improve stem cell growth and possible tissue regeneration. His success has led to him receiving an NIH R01 grant, which is considered mountaintop in the world of NIH grant funding.

Dr. Li has focused on applying nanomedicine to solve problems recognized in orthopaedics including infection and improvements in drug delivery. In his time at WVU, Dr. Li has published over 90 manuscripts, book chapters, and books. Dr. Li has been recognized several times over the past year for his work including induction into the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows, which is one of the highest professional distinctions accorded to a medical and biological engineer.

Dr. Jones' research focuses on physical activity programs, self-management of arthritis, and epidemiology trends in the surrounding Appalachian regions.

In addition to a cadre of young scientists that have developed into tenured professors in Drs. Jones, Li and Pei, Dr. Emery recognized the importance of developing young clinician-scientists.

“There are many obstacles to including research as part of a career. The research resident program provides guidance on not only how to navigate the system but also breeds early success and avoids some of the frustrations and early fatigue that many specialists experience with research.”

Brock Lindsey, MD, Assistant Professor, Director of the Musculoskeletal Laboratory, Chief, Adult Reconstruction and Musculoskeletal Oncology

Brock Lindsey, M.D., Assistant Professor, Director of the Musculoskeletal Laboratory, Chief, Adult Reconstruction and Musculoskeletal Oncology, and, was the first research resident under Dr. Emery's tenure. Now in its fourteenth year, the research resident track has one resident spend a year between their intern year and second year of residency learning the fundamentals of research by performing both basic and clinical research.

The research resident is matched into a six-year track for residency and has the opportunity to pursue their own research projects as well as work with any of the established PIs or surgeons on their research projects.

Dr. Lindsey describes this year as the research resident as “life changing” for his career. His work as a research resident focused on immunomodulation for infection in a femur fracture model that he developed (Lindsey, J Orthop Res 2010); this model has led to his current focus using immunotherapies to improve treatment success in osteosarcoma.

Of the fourteen research residents that have successfully completed the program, Dr. Emery has recruited two to stay at WVU. Dr. Lindsey was the first. Matthew Dietz, M.D., Assistant Professor, was the second. Dr. Dietz is also a product of Dr. Emery's research resident farm system.

“There are many obstacles and hurdles to including research as part of career,” Dietz said. “The research resident program provides guidance on not only how to navigate the system but also breeds early success and avoids some of the frustrations and early fatigue that many specialists experience with research.”

Dr. Dietz's efforts have led to him receiving an NIH Career Development K-award for his work on implant associated infections and improved surgical debridement using biomarkers and fluorescent technology.

THE FUTURE

To see the growth and transformation of a clinical department to a research

workhorse takes the vision and commitment of leadership and boots on the ground to make that vision a success.

Suzanne (Smith) Danley, Research and Grants Analyst, says, “It's been an interesting transformation from a handful of clinicians, performing research in their down time, to the department [and lab] we are today.”

She recounts that in 1987, she mainly performed secretarial work on an electric IBM typewriter and walked sheep on a treadmill. Fast forward to 2018, where the lab is performing tissue engineering, using 3D printers for creating biomaterials and novel implants, and proposing and attaining funding for millions of dollars of research.

The future of the lab within the department includes growth.

Jonathan Boyd, Ph.D., associate professor, director of Graduate Studies and associate director of the Musculoskeletal Laboratory, was recruited to the lab in the summer of 2018. His background in biochemistry and research focus on the human response to stress (chemical, biologic, physical) was seen as an opportunity to provide synergistic research opportunities and growth within the program.

With Dr. Boyd's guidance and the investment of all of the primary investigators, the lab continues to recruit masters and doctoral-level students including an MD/PhD program, which has found new life within the Health Sciences Center.

The support and people within the lab continue to be outstanding with Amanda Stewart, PhD, Gerry Hobbs, PhD, Suzanne (Smith) Danley, Sherri Davis, Josh Parenti, Elizabeth Stewart, and Jenn Eicher providing the support needed to accomplish what sometimes seems like a herculean effort of completing a research project.

The chasm that exists between basic science research and the patients it could impact is often referred to as the “Valley of Death.” It is in this “valley” that, historically, the lack of communication between biomedical researchers and clinicians led to great understanding of mechanisms and molecular biology without

• The lab is performing tissue engineering, using 3D printers for creating biomaterials and novel implants, and proposing and attaining funding for millions of dollars of research.

an impact on patient care. In the WVU Musculoskeletal Laboratory, scientists and clinician-investigators work together with the goal of bridging that gap and bringing new, cutting edge technologies and advancement in health care from the bench to the bedside where they can have a true impact on the lives of our patients.

Jonathan Boyd PhD

Dr. Boyd was recently awarded a substantial Department of Defense grant in February 2019 regarding spatial characterization of neuroinflammation associated with exposures to pesticides when coupled with stress using an established model.

Benjamin M. Frye MD

- Title: Fellowship in Adult Reconstruction
Source: OMeGA Medical Grants Association

Bingyun Li PhD

- Title: Innovative Implant Nanocoatings with Controlled Dual Drug Release for Bone Regeneration
Source: US DoD
 - Title: Targeting Intracellular Bacteria of Chronic Infections
Source: WVU PSCoR
 - Title: Exploring an Innovative Local Combination Drug Delivery to Treat IM Nailing Infection: Pilot In Vivo Studies
Source: Osteosynthesis & Trauma Care Foundation
 - Title: Feasibility study to demonstrate the presence of intracellular bacteria in chronic infection patients
Source: West Virginia Clinical and Translational Science Institute
- ### Brock Lindsey MD
- Title: A prospective, post-market, multi-center study of titanium acetabular shell
Source: Stryker
 - Title: Comparative effectiveness of pulmonary embolism prevention after hip and knee replacement (PEPPER): Balancing Safety and Effectiveness
Source: Medical University of South Carolina

Scott D. Daffner MD

- Title: A Phase 2b, randomized, double-blind, placebo-controlled study to evaluate the safety and efficacy of staphylococcus aureus 4-antigen vaccine (SA4Ag) in adults undergoing elective posterior instrumented spinal fusion procedures
Source: Pfizer Pharmaceutical
- Title: A Prospective Study of OsteoAMP in Posterolateral Spinal Fusion: Patient Outcomes and Use in Clinical Practice
Source: Bioventus, LLC
- Title: M6-C Artificial Cervical Disc IDE Pivotal Study
Source: Spinal Kinetics

Matthew J. Dietz MD

- Title: Relationship of Biomarkers and Fluorescence in Prosthetic Knee Infections
Source: US DHHS-NIH-National Institute of Arthritis, Musculoskeletal & Skin Diseases
- Title: Preclinical assessment of an active antibiotic spacer
Source: West Virginia Clinical and Translational Science Institute
- Title: Electrolysis as an adjunct treatment in postoperative orthopaedic implant infections
Source: West Virginia Clinical and Translational Science Institute
- Title: Teaching & Learning Commons Technology Integration Grant
Source: Teaching & Learning Commons – West Virginia University

John C. France MD

- Title: Thoracolumbar Burst Fractures (AOSpine A3, A4) in Neurologically Intact Patients: An Observational, Multicenter Cohort Study Comparing Surgical Versus Non-Surgical Treatment
Source: AO Research Foundation

David F. Hubbard MD

- Title: Fixation using alternative implants for the treatment of hip fractures
Source: McMaster University
- Title: A Prospective, Randomized, Multicenter Controlled Trial of CERAMENT™[G as Part of Surgical Repair of Open Diaphyseal Tibial Fractures
Source: BONE SUPPORT AB

Dina Jones PT, PhD

- Title: A randomized controlled trial of a community-based chronic pain self-management program in West Virginia
Source: US DHHS – CDC - National Center for Chronic Disease Prevention and Health Promotion
- Title: West Virginia University Injury Control Research Center
Source: US DHHS-CDC-National Center for Injury Prevention and Control

Ming Pei MD, PhD

- Title: Decellularized matrix and cartilage regeneration
Source: US DHHS – NIH – National Institute of Arthritis, Musculoskeletal, and Skin Disease
- Title: Allogeneic Matrix Mediated Cartilage Reconstruction
Source: Musculoskeletal Transplant Foundation

Robert D. Santrock MD

- Title: Multi-center Early Clinical and Radiographic Outcomes of Triplanar Correction for Hallux Valgus Deformity
Source: Treace Medical Concepts, Inc.



Dr. Li was nominated, reviewed, and elected by peers and members of the College of Fellows for “outstanding contributions in developing materials for orthopedic and biomedical applications, services to the biomaterial/orthopedic communities, and advocacies for research.”

A formal induction ceremony was held during the AIMBE Annual Meeting at the National Academy of Sciences in Washington, DC on March 25, 2019. Dr. Li was inducted along with 156 colleagues who make up the AIMBE College of Fellows Class of 2019.

While most AIMBE Fellows hail from the United States, the College of Fellows has inducted Fellows representing 30 countries. AIMBE Fellows are employed in academia, industry, clinical practice and government.

AIMBE Fellows are among the most distinguished medical and biological engineers including 2 Nobel Prize laureates, 17 Fellows having received the Presidential Medal of Science and/or Technology and Innovation, and 158 also inducted to the National Academy of Engineering, 72 inducted to the National Academy of Medicine and 31 inducted to the National Academy of Sciences.

The American Institute for Medical and Biological Engineering (AIMBE) has announced the induction of Bingyun Li, Ph.D., Professor and Director of Nanomedicine Laboratory, Department of Orthopedics, School of Medicine, West Virginia University, Morgantown to its College of Fellows.

Election to the AIMBE College of Fellows is among the highest professional distinctions accorded to a medical and biological engineer. The College of Fellows is comprised of the top two percent of medical and biological engineers. College membership honors those who have made outstanding contributions to “engineering and medicine research, practice, or education” and to “the pioneering of new and developing fields of technology, making major advancements in traditional fields of medical and biological engineering, or developing/implementing innovative approaches to bioengineering education.”

About AIMBE

AIMBE is the authoritative voice and advocate for the value of medical and biological engineering to society. AIMBE's mission is to recognize excellence, advance the public understanding, and accelerate medical and biological innovation. No other organization can bring together academic, industry, government, and scientific societies to form a highly influential community advancing medical and biological engineering. AIMBE's mission drives advocacy initiatives into action on Capitol Hill and beyond.

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Yours truly,

Sanford E. Emery MD, MBA

Professor and Chairman,
Department of Orthopaedics,
West Virginia University

Director of Surgical Services,
WVU Medicine

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