WVUMedicine
PO Box 9083
Morgantown, WV 26506-9083

ORTHOPAEDIC LOCATIONS

WVUMedicine.org // medicine.hsc.wvu.edu/ortho

PHYSICIAN OFFICE CENTER

1 Medical Center Drive
Morgantown, WV 26505

CLINICS:

– WVU ORTHOPAEDICS

WVU MEDICINE OUTPATIENT CENTER: FAIRMONT

100 Stoney Hill Road
Fairmont, WV 26554

CLINICS:

– WVU ORTHOPAEDICS

WVU SPINE CENTER

943 Maple Drive
Morgantown, WV 26505

WVU MEDICINE UNIVERSITY TOWN CENTRE

6040 University Town Centre Drive
Morgantown, WV 26501

CLINICS:

– WVU MEDICINE SPORTS MEDICINE CENTER

– CENTER FOR JOINT REPLACEMENT AT WVU MEDICINE

Patients can call **855-WVU-CARE** to schedule an appointment at any of our locations.

2017 ORTHOPAEDICS ANNUAL REPORT

WVUMedicine

CONTENTS

WVU Medicine is booming! There are now nine hospitals in the WVU Medicine system and four managed hospitals. Here on the main campus, we have the Heart and Vascular Institute going strong, and the Rockefeller Neuroscience Institute started and will develop over the next few years. We have broken ground for the WVU Medicine children's Hospital here on campus, which is very exciting.

WELCOME

Sanford E. Emery MD, MBA

Professor and Chairman,
Department of Orthopaedics,
West Virginia University

Director of Surgical Services,
WVU Medicine

The Department of Orthopaedics has been a major participant and contributor to the expansion of our healthcare system. In my opinion, orthopaedics has been good for the last decade, excellent for the past five years, and now we are an outstanding Department.

Here's why:

- 33 Full-time faculty
- 3 Multidisciplinary centers (Total Joint, Sports Medicine, and Spine)
- Initiation of a Physical Medicine and Rehabilitation Division
- Nationally recognized "Own The Bone" Program for patients with osteoporosis
- Pre-op Optimization Program led by two newly recruited internal medicine faculty for our Department
- $1.4 million dollars in federal funding over the past two years, $1.9 million dollars in federal funding over the past five years, and $5.27 million dollars in total funding in the past 10 years
- 6 Faculty as ABOS Board Examiners, 6 Faculty as American Orthopaedic Association members
- Program development and team coverage for WVU Athletics
- Robotic surgery in spine and adult reconstruction
- Outreach programs in Charleston, Martinsburg, Parkersburg, and Summersville
- Overseas outreach to Haiti this coming October (Hospital Sacre Coeur)
- Increasing surgical volumes approximately 15 percent over the last 4 years
- Increasing clinical volumes approximately 50 percent over the last 4 years

Good stuff! But our culture is our strongest asset: excellence, customer service, and productivity. As we grow in breadth and depth of services and number of faculty, our close-knit culture is our bedrock throughout the Department. And though this publication is physician oriented, we would be nowhere without our incredibly smart, committed, and hardworking staff of nurses, schedulers, medical assistants, research assistants, and more. I want to publicly thank them all, and we dedicate this Annual Report to them.

Please read on!

Sanford E Emery MD

MISSION AND GOALS

Here at WVU Medicine, our mission is simple: to serve the people in the state of West Virginia and beyond in the diagnosis and treatment of all musculoskeletal conditions; to promote translational and clinical research that will impact the profession of orthopaedic surgery; and to train the best residents in the highest quality learning environment. Our subspecialty areas of expertise cover all of orthopaedics, i.e. total joint replacement, sports medicine, spine, foot and ankle, hand, pediatrics, trauma, and musculoskeletal oncology. Our physician's assistants, nurses, schedulers, and staff are committed to helping patients in a friendly and efficient manner, looking at how we do business from the viewpoint of the customer. We have three principles for our entire departmental organization: excellence, customer service, and productivity.

We are an integral part of the WVU Health Sciences Center and J.W. Ruby Memorial Hospital. Our outpatient locations include the University Town Centre (our ambulatory site, which houses our Center for Joint Replacement, Sports Medicine Center, and hand programs); the Physician Office Center attached to Ruby Memorial Hospital; and the WVU Spine Center located in the HealthWorks building on Maple Drive. Our phone numbers are provided for scheduling appointments, for questions for physicians and their offices, or whatever else our patients may need.

We look forward to servicing Morgantown, the state of West Virginia, and the surrounding regions.

OWN THE BONE

WVU Medicine has been recognized by the American Orthopaedic Association Own the Bone® Program as a 2019 Star Performer. The program is aimed at better identifying, evaluating, and treating patients who suffer from an osteoporosis or low bone density-related fracture.

Own the Bone® brings attention to the severe health implications of fragility fractures, which commonly result from minor falls.

"Patients who are prone to fragility fractures require additional care and support from our clinical staff," Colleen Watkins, MD, WVU Medicine orthopaedic specialist, said. "We are proud to be able to offer a multidisciplinary approach to ensure these patients receive comprehensive and safe care."

According to the National Osteoporosis Foundation, up to 50 percent of all women and 25 percent of men over the age of 50 years will sustain a fragility fracture. Studies show that patients who have had a fragility fracture are two-to-four times more likely to experience another fracture than those who have never had a fracture.

"We have implemented fall prevention programs that ensure patient safety during outpatient visits and inpatient stays," Dr. Watkins said. "These programs have shown a significant decrease in injuries to both patients and staff."

Own the Bone Star Performer designation is awarded to institutions that have achieved a 75 percent compliance rate with at least five of the 10 Own the Bone® prevention measures.

FACULTY + CLINICAL AND RESEARCH

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

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

Benjamin Frye MD
Assistant Professor; Director,
Adult Reconstruction
Fellowship

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

Derik Geist MD
Assistant Professor,
Orthopaedics, Sports
Medicine

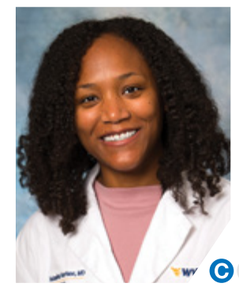
Daniel Grant MD
Assistant Professor,
Pediatric Orthopaedics

Karen Barr MD
Chief, Associate 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



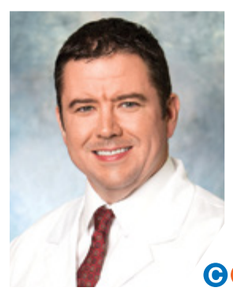
Natasha Harrison MD, MPP
Assistant Professor
Orthopaedics, Sports Medicine

Bethany Honce MD
Assistant Professor, Physical
Medicine and Rehabilitation

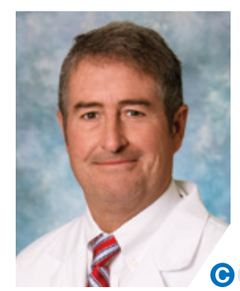
Rusty Cain DPM
Assistant Professor,
Orthopaedics

Shari Cui MD
Assistant Professor,
Orthopaedics, Spine

Scott Daffner MD
Associate Professor,
Orthopaedics, Spine



Matthew Dietz MD
Assistant Professor,
Orthopaedics, Adult
Reconstruction



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

SOCIETY POSITIONS AND NATIONAL COMMITTEES

Sanford E. Emery MD, MBA
ABOS: Director, 2008-present; President, 2014-2015; Treasurer, 2011-2013; Chair, Finance Committee, 2011-2013; Chair, Credentials Committee, 2011-2013;
AOA: President, 2016-2017; Treasurer, 2011-2013; Executive Committee, 2010-present;
CSRS: President, 2010- 2011; Treasurer, 2006-2009

John C. France MD
AAOS: Spine Program Committee, 2013-2017
AOSNA: Education Committee, 2010-2013; Board Member, 2006-2010
CSRS: Research Committee, 2012-2013; Education Committee, 2007-present
OTA: Development Fund Committee, 2014-2017
SRS: Education Committee, 2011-2016

Scott Daffner MD
CSRS: Research Committee, 2014-2017; Member Survey Committee, 2015-2016
NASS: Membership Committee, 2009-present
Lumbar Spine Research Society: Program Committee, 2016-present

Matthew Dietz MD
AAHKS: Research Committee, 2017-present

Daniel Grant MD
POSNA CORE: Curriculum Committee, 2016-present

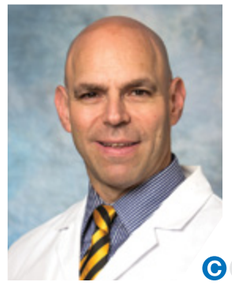
Natasha Harrison MD, MPP
AMSSM: Membership Committee, 2013-present

David F. Hubbard MD, MBA
AO Foundation: Board of Trustees, 2011-2016
AO North America: Musculoskeletal Trauma Education Committee, 2009-present
OTA: Education Committee 2008-2010

FACULTY + CLINICAL AND RESEARCH

Cherie L. Kelly-Danhires DPM
Assistant Professor, Orthopaedics

Kathryn Kasicky MD
Assistant Professor, Orthopaedics, Internal Medicine

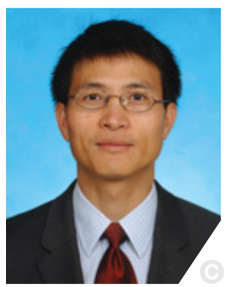


Adam Klein MD
Assistant Professor, Orthopaedics, Adult Reconstruction

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

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



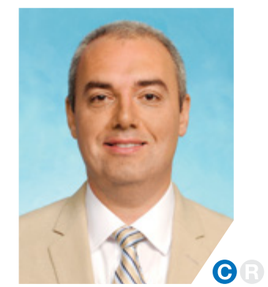
Bingyun Li PhD
Professor, Orthopaedics, WVU Cancer Institute Research Programs

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

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

David Lynch MD
Assistant Professor, Physical Medicine and Rehabilitation

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



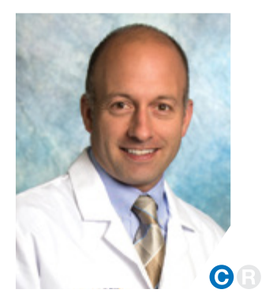
Shafic Sraj MD
Assistant Professor, Orthopaedics, Hand and Upper Extremity

Barry McDonough MD
Associate Professor, Orthopaedics, Sports Medicine

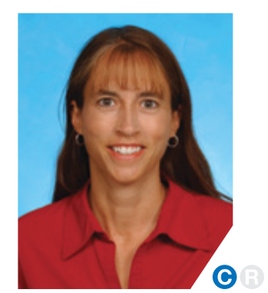
Benjamin Moorehead MD
Assistant Professor, Orthopaedics, Sports Medicine

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

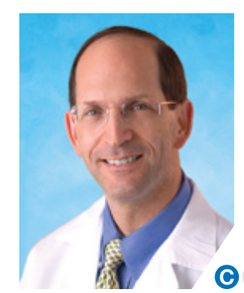
Jami Pincavitch MD
Assistant Professor, Orthopaedics, Internal Medicine



David Tager MD
Assistant Professor, Pediatric Orthopaedics



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



David Waxman MD
Associate Professor, Orthopaedics, Adult Reconstruction

SOCIETY POSITIONS AND NATIONAL COMMITTEES

John P. Lubicky MD
AAOS: Judiciary Committee, 2016-present
POSNA: Member Archivist Committee, 2010-present; Development Committee 2017-present
SRS: Chair, SRS Advocacy Committee, 2010-2011; Chair, SRS Communications Committee, 2012-2016

Barry McDonough MD
AOA: CORD Education Subcommittee, 2013-2014
AOSSM: Self-Assessment Committee, 2016-present

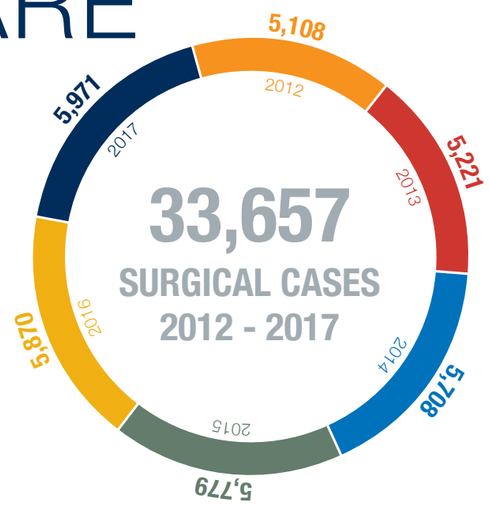
Benjamin Moorehead MD
AMSSM: Research Committee, 2013-2014

Ming Pei PhD
ICRS: Membership & Bylaw Committee, 2015-present

Robert Santrock MD
AOFAF: Public Education Committee, 2012-2017

Colleen Watkins MD
AOA: Own The Bone Steering Committee, 2017-present

PATIENT 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.

+ INFECTIOUS DISEASE CLINIC

In the fall of 2017, the Orthopaedics Infectious Disease Clinic was established at the WVU Center for Joint Replacement. More than 100 patients have been treated since its inception. The goals of the clinic are to decrease the number of patient visits, increase patient satisfaction, and improve patient care by improving communication and team-based care between ID and Orthopaedics. The combined clinic has been a great success.

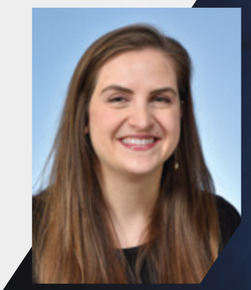
Patients are usually identified in the inpatient setting when they are seen by Orthopaedics and ID. Follow-up is coordinated at the time of discharge.

Previously, patients had to make separate appointments and trips to the two specialty clinics. Each individual visit would usually take more than 30 minutes, not to mention the travel time, especially if the visits were on separate days. Now patients are able to manage both concerns in one convenient location in less than 45 minutes.

Current care teams consist of one Infectious Disease specialist and two to three orthopaedic specialists.

> "Mom lives in a rural area. The senior van brings her to her visits, and she has to climb in and out of the van. The less times she has to get in and out of the van, the better it is for her. I love the convenience of her being able to be seen in one clinic. It also frees up the van for other seniors who might need it. I love that Orthopedics and ID communicate on the same day and have a plan when the patient leaves clinic."
>
> – Sherry R.

> "From all I've been through, I come here and can be given a definitive plan. That's top notch. The doctors here are genuinely concerned about their patients. They make sure their patients are heard."
>
> – John W.



Allison Lastinger MD
- **Matthew Dietz** MD
- **Brock Lindsey** MD
- **T. Ryan Murphy** MD

Nicole Bryan MD, PhD
- **Benjamin Frye** MD
- **Adam Klein** MD

OUTPATIENT JOINT REPLACEMENT SURGERY: WVU ATHLETIC DIRECTOR SHANE LYONS

Shane Lyons, director of athletics and associate vice president at West Virginia University, has overseen and led the growth of 18 Mountaineer athletics programs since his arrival in 2015. The Athletic Department has seen unparalleled success in the past few years under his leadership.

But, what happens when an active leader begins having joint pain and difficulty with mobility?

Lyons had been pushing through right knee pain for a long time, but, in the past two years, it had become so severe that he had difficulty with simple activities of daily living and sleeping. This pain made his busy, active schedule difficult and was no longer helped by medication, exercise, or injections.

Lyons was living with severe knee arthritis, and after discussion with Benjamin Frye, MD, at the WVU Medicine Center for Joint Replacement, he decided to proceed with outpatient total knee replacement surgery.

"Mr. Lyons' young age and good health made him an ideal candidate for outpatient total knee replacement surgery. The surgical techniques, pain control, and rapid recovery protocols at the WVU Medicine Center for Joint Replacement have made outpatient joint replacement surgery a reality," Dr. Frye said.

Lyons' knee surgery was performed at 7:00 am on January 4, 2018. He was up walking within hours and was discharged home by 3:00 pm that same day.

"I heard what you all said, 'You're not sick. Go home, and start the movement and activity.' There's going to be some pain, you know that initially, but you get over that in the first 72 hours," Lyons said. "You keep pushing yourself a little more each day to get more mobility and strength, and it comes back pretty quickly as long as you're doing your exercises and are prepared for it."

Lyons has seen an excellent recovery after knee replacement. His pain is gone, and his mobility and quality of life have seen dramatic improvement.

"It's definitely been a life-changer, just from a mobility standpoint and being able to do everyday activities without being on any type of aspirin or ibuprofen," he said. "THE ACHES AND PAINS THAT I HAD BEFORE ARE NOT THERE ANYMORE. IT'S BEEN SIX MONTHS NOW, BUT IT FEELS LIKE IT'S BEEN MY KNEE WHEN I WAS 20 YEARS OLD."

The WVU Medicine Center for Joint Replacement started offering outpatient hip and knee replacement surgery to appropriate candidates in 2016.

Shane Lyons | Benjamin Frye, MD
Right knee x-rays: Pre-op Lat | Pre-op AP | Post-op AP

PATIENT CARE

EOS IMAGING

At the urging of John P. Lubicky, MD, professor of orthopaedic surgery and pediatrics and chief of Pediatric Orthopaedic Surgery, WVU Medicine Children's received the state's first and only EOS Imaging system in July 2017.

This 2D/3D technology has become a staple in major children's hospitals across the country and the world. Its main uses are for imaging the spine and leg alignment. While its primary patient focus is children, it is useful for leg alignment assessment in adult lower extremity patients as well.

The ultrasensitive multi-wire proportional chamber detector can detect x-rays at much lower dose to the patient but can still produce excellent images.

The EOS system also allows simultaneous anteroposterior (AP) and lateral 2D images of the whole body to be taken in a calibrated environment, permitting the 3D reconstruction of spine and lower limb bony structures by stereo-radiography.

The images are taken in the standing (or, if need be, sitting) position, allowing the spine and lower limbs to be examined under normal weight-bearing conditions.

The sterEOS software bundled with the EOS imaging system makes it possible to perform 3D reconstruction of bone structures. It uses algorithms based on statistical modeling and bone-shape recognition.

By using the stereographic software application's valuable 3D information, the patient's anatomy can be visualized from numerous perspectives. It can automatically calculate more than 100 unbiased clinical parameters; provide 3D print models to improve communication with patient and medical team; and can help plan surgeries in 3D with web-based, surgical planning software.

Having this new technology at WVU Medicine Children's has raised the standard of pediatric services we are providing.

PATIENT CARE

PHYSICAL MEDICINE AND REHABILITATION

The Department of Orthopaedics expanded in September 2017 with the addition of the Division of Physical Medicine and Rehabilitation (PM&R). Unlike other medical specialties that focus on a medical "cure," the goal of PM&R physiatrists is to maximize patients function, increase independence, and improve quality of life.

The Division currently has two faculty members, Karen Barr, MD, chief of PM&R, and Bethany Honce, MD.

Dr. Barr joins us from the University of Washington, where she was residency program director and director of electrodiagnostics. Dr. Barr sees patients at the Spine Center and does electrodiagnostic studies at the EMG lab.

Dr. Honce grew up in Martinsburg and is a WVU School of Medicine graduate. She was in private practice in Morgantown prior to joining the division. She directs care for WVU patients admitted for inpatient rehabilitation at HealthSouth MountainView in Morgantown, as well as treats patients in the outpatient setting. Both also see patients in consultation at J.W. Ruby Memorial Hospital.

Referral forms for the Spine Center and other service lines can be found at:

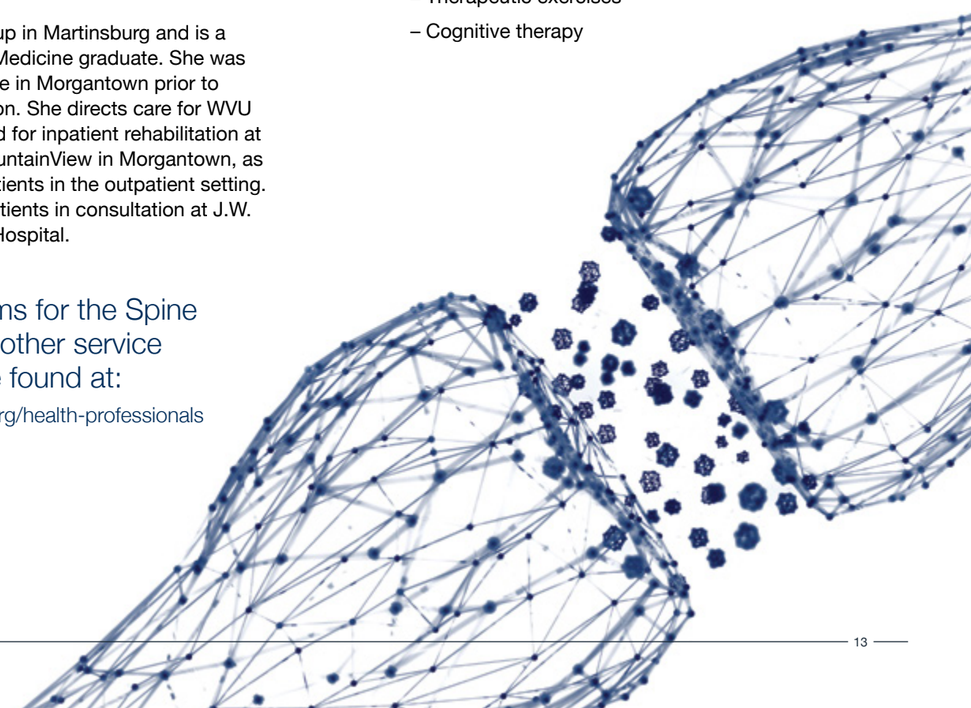
WVUMedicine.org/health-professionals

Typical conditions include:

- Patients with neurological problems, such as spinal cord injury, stroke, spasticity, and peripheral neuropathy.
- Patients with neurological and musculoskeletal consequences of cancer and cancer treatments or other significant medical illnesses who fail to recover to their baseline function
- Patients with musculoskeletal problems, such as tendonitis, joint pain, neck, and back pain
- Patients with amputations and gait or balance problems

Treatments may include:

- Adaptive devices
- Injections
- Medications
- Therapeutic exercises
- Cognitive therapy



RESIDENCY PROGRAM

The West Virginia University Department of Orthopaedics Residency Program had another successful academic year in 2017-2018. The residents received excellent training and operative experience in each of the subspecialties, including Trauma, Adult Reconstruction, Pediatrics, Sports, Foot and Ankle, Oncology, Spine, and Hand.

The intern class started training in July with an Orthopaedic Skills Month, which provided an introduction to splinting, casting, x-ray interpretation, orthopaedic emergencies, and other important topics. Residents enjoyed routine educational opportunities in our anatomy dissection lab and arthroscopy lab.

Research was a top priority for the program this year. The residents were quite productive, presenting their work at multiple local, regional, and national meetings. In addition, the residents enjoyed teaching external fixator application and compartment fasciotomy technique to several groups of Army Special Forces Medics from Fort Bragg, North Carolina. Athletic coverage for the varsity football team was another favorite experience for residents.

In addition to learning orthopaedics, the residents were involved in many extracurricular events. The once legendary softball team was revived and enjoyed a successful year. Unfortunately, the team fell a little short in playoffs. The residents also enjoyed a post-OITE party sponsored by the faculty. Tailgates hosted by Dr. Santrock continued to be a favorite tradition. Over the holidays, many resident families got together to celebrate Thanksgiving and New Year's Eve. There were also several trips to Pittsburgh to enjoy the zoo, Pirates games, concerts, and festivals. Lastly, the resident room received major upgrades with a donated flat screen TV and Nintendo 64. This led to many heated Mario Kart competitions.

The PGY-5 chief resident class will graduate in June 2018 and will begin fellowship training in August 2019. The graduating residents include Andrew Hanselman (Duke University – Foot and Ankle), Andrew Friedmann (University of Texas at Houston – Foot and Ankle), Daniel Bravin (University of California, Davis – Trauma), and Ross Smith (OrthoIndy – Trauma). We are extremely proud of our chief residents and wish them the best of luck as they begin fellowship and start to practice.

As we say goodbye to the PGY-5 class, we are excited to welcome in a new class of interns. The class of 2023/2024 will include Patrick Luchini (West Virginia University), Eric Neuman (West Virginia University), Joshua Reside (University of Florida), and Taylor Shackelford (University of Kentucky). Taylor will be the research year resident after his intern year. We can't wait for the new crew to arrive on campus.

The 2017-2018 academic year has been an excellent year for the Department of Orthopaedics. We continue to evolve our resident education in an effort to train competent and conscientious orthopaedic surgeons. We look forward to what the 2018-2019 year has in store.

RESIDENCY PROGRAM

GRADUATES AND CURRENT RESIDENTS

Daniel Bravin MD

SOM: Texas Tech University

Fellowship: University of California, Davis, Orthopaedic Surgery Trauma

Andrew Friedmann MD

SOM: University of Toledo

Fellowship: University of Texas, Houston, Foot and Ankle

Andrew Hanselman MD

SOM: West Virginia University

Fellowship: Duke, Foot and Ankle

Ross Smith MD

SOM: University of Tennessee

Fellowship: OrthoIndy, Orthopaedic Trauma

Jonathan Karnes MD

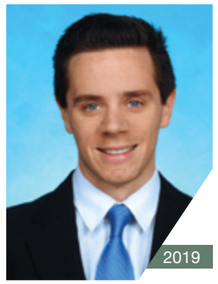
SOM: Ohio State University

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

Phillip Bostian MD

SOM: East Carolina University

Mark Plumby MD

SOM: West Virginia University

Daniel Shubert MD

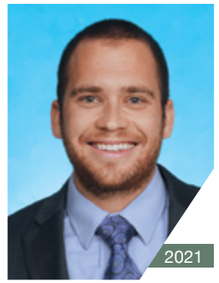
SOM: Tufts University

Richard Wardell MD

SOM: University of Central 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

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

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

Taylor Shackleford MD

SOM: University of Kentucky

RESIDENCY PROGRAM

RESEARCH YEAR

At West Virginia University, we have an Accreditation Council for Graduate Medical Education-accredited orthopaedic surgery research position available each year. This position is a six-year track, compared to our traditional five-year categorical track, and 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. The residents are provided with a start-up fund to design and execute their own 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, MD, (Musculoskeletal Oncology) is the WVU Orthopaedics Research Laboratory director and advises lab residents during their research year. He, along with Matthew J. Dietz, MD, (Adult Reconstruction), Ming Pei, PhD, and Bingyun Li, PhD, conduct a 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 facilities are located on the fifth floor of the 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 morning resident education conferences, performs monthly cadaver dissection for anatomy conference, assists with gross anatomy labs for first-year medical students, and occasionally provides lectures to the School of Medicine Orthopaedic Surgery Interest Group. 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

2016-2017 PRESENTATIONS AND AWARDS

Daniel Bravin MD 2018

- **Podium presentation:** Bravin D, Hubbard D, Bravin L, France J, Bramer M. "A prospective randomized controlled trial comparing immediate weight bearing versus touch-down weight bearing in extra-articular distal femur fractures."

  Presented at: Orthopaedic Trauma Association Annual Meeting. Vancouver, BC, Canada. 2017

  ➤ **Recognized as as one of the top papers presented at the 2017 OTA Annual Meeting by the Program Committee.**

Phillip Bostian MD 2020

- **Podium presentation:** "TEG is predictive of blood transfusion and mortality in patients with traumatic pelvis fractures."

  Presented at:
  - Southern Orthopaedic Association Annual Meeting. Hilton Head, SC. 2017
  - Resident Research Day. Morgantown, WV. 2017
  - West Virginia Orthopaedic Society. Roanoke, WV

  ➤ **Best Resident Research Project, West Virginia Orthopaedic Society. 2017**

  ➤ **Resident Research Award, West Virginia University Department of Orthopaedics. 2017**

- **Podium presentation:** "TXA in total hip arthroplasty: does surgical approach and route of administration matter?"

  Presented at:
  - Southern Orthopaedic Association Annual Meeting. Hilton Head, SC. 2017

- **Poster presentation:** "Comparison of outcomes in end stage knee arthroplasty: Megaprosthesis versus knee arthrodesis."

  Presented at:
  - AAOS Annual Meeting. San Diego, CA. 2017
  - American Orthopaedic Association. Charlotte, NC. 2017
  - Resident Research Day. Morgantown, WV. 2017

- **Poster presentation:** "Thromboelastography (TEG) is predictive of blood transfusion and mortality in patients with traumatic femur fractures."

  Presented at: Orthopaedic Trauma Association Annual Meeting. Vancouver, BC, Canada. 2017

- **Podium presentation:** "A novel rat tail discitis model using bioluminescent Staphylococcus aureus."

  Presented at:
  - American Orthopaedic Association. Charlotte, NC. 2017
  - Resident Research Day. Morgantown, WV. 2017

Brian Grisez MD 2021

- **Podium presentation:** Grisez BT, Karnes J, Bostian PA, Brown C, Moushmoush O, Dietz MJ. "Nutrition status during two-stage management of prosthestic joint infection."

  Presented at: Southern Orthopaedic Association Annual Meeting. Hilton Head, SC. 2017

- **Podium presentation:** Grisez BT, Bostian PA, Dietz MJ. "TXA in Total Hip Arthroplasty: Does surgical approach and route of administration matter?"

  Presented at:
  - Southern Orthopaedic Association Annual Meeting. Hilton Head, SC. 2017
  - West Virginia Orthopaedic Society. Roanoke, WV

- **Poster presentation:** Grisez BT, Bostian PA, Dietz MJ. "Surgical approach and BMI can influence effectiveness of TXA administration in total hip arthroplasty."

  Presented at: Van Liere. Morgantown, WV. 2017

Jonathan Karnes MD 2019

- **Poster presentation:** Dietz MJ, Bostian PA, Ernest EP, Friedmann AF, Klein AE, Frye BM, Karnes JM, Lasala PR, Lindsey BA. "Are we working in a dirty field? Contamination of surgical surfaces during revision of an infected total joint arthroplasty."

  Presented at: AAOS Annual Meeting. San Diego, CA. 2017

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:
  - AAOS Annual Meeting. San Diego, CA. 2017
  - AOA Annual Meeting. Charlotte, NC. 2017

Richard Wardell MD 2020

- **Podium presentation:** McDonough E, Shepet, K, Bal G. "Immediate weight bering on distal femur fractures, a prospective randomized trial."

  Presented at:
  - West Virginia Orthopaedic Society. Roanoke, WV

  ➤ **Awarded second place for resident research presentations**

RESEARCH

In the West Virginia University Orthopaedic Research Laboratory, you will find research and educational opportunities in the areas of soft and hard tissue mechanics, tissue engineering, nanotechnology, adult reconstruction, spine, sports medicine, trauma, hand and upper extremity, and microsurgery.

The laboratory conducts in-vivo and in-vitro research in a modern environment. The laboratory faculty and staff are multidisciplinary, consisting of faculty from Statistics, Microbiology and Immunology, Pathology, and Orthopaedics. Graduate students from the University's Health Sciences Center and College of Engineering and Mineral Resources collaborate with orthopaedic surgeons and bioengineers on MS and PhD research topics.

The lab is situated within the Department of Orthopaedics at WVU and provides support to orthopaedic residents in basic science research projects. The lab also provides facilities and encourages multidisciplinary musculoskeletal research between various departments in the Health Sciences Center.

ARTHROSCOPY LAB

The Orthopaedic Research Lab houses an arthroscopy wet lab. It has a Stryker arthroscopic system that contains all the components required to conduct teaching labs with the residents or to conduct research. The lab has access to fresh cadaver tissue that is utilized for both teaching and research.

CADAVERIC TEACHING LAB

The Cadaveric Teaching Lab is equipped with a full array of surgical instrumentation, including power equipment, for anatomical dissection. Often the dissection is to practice procedures and surgical approaches, while at other times dissection is an integral part of research projects that involve specific cadaveric tissue. This particularly valuable asset is available to faculty and residents.

The cadaveric lab is now also equipped with state-of-the-art video conferencing equipment that makes interactive conferencing with surgeons state- and nation-wide easily accomplished. True HD cameras carry the signal to the Learning Center to allow the classroom participants to watch live. The video conferencing equipment is also capable of recording videos for use as instructional videos or as presentation media to view surgical techniques suitable for submission to national or international meetings.

CELL CULTURE LAB

The Cell Culture Lab is a fully equipped active lab with all the essential equipment for growing and maintaining cell cultures. Human cell lines, animal cell lines, and tissue-derived cells are used in experiments.

HISTOLOGY LAB

This lab is fully equipped to process tissue samples for histology. Tissues can be processed, sectioned, and stained in this lab. A fume hood along with an embedding station and a microtome are available at all times for departmental use. A chemical cabinet with all chemicals necessary for histological procedures is housed in the same lab.

IMAGE ANALYSIS CENTER

The Orthopaedic Research Lab utilizes optical facilities located at the Image Analysis Center within the Department of Anatomy. The center supports transmitted and reflected light microscopy with Optimus image analysis software, inverted stage microscopy, confocal microscopy, and SEM. Image analysis and slide-making workstations are also available.

MICROSURGERY LAB

The Microsurgery Lab has two operating microscopes and has a dedicated microsurgical technician who has years of experience teaching residents and faculty how to perform these delicate procedures. Basic and advanced microsurgical techniques (arterial anastomosis, venous anastomosis, and neural anastomosis) are taught.

The lab is also used for basic science research. There is currently a project being conducted that involves repairing a rat femur fracture using a K-wire as an intramedullary nail. Because of the small size of the operative field, use of the operating microscope is required.

MOLECULAR BIOLOGY LAB

Routine molecular biological analyses and tests on tissue and cultured cell lines are performed in this laboratory. RNA extraction from cartilage and bone tissue and other cultured cells followed by real-time PCR are also carried out. This lab is also equipped to carry out protein extraction, gene-transfer research, and plasmid cloning.

NANOTECHNOLOGY LAB

The lab is outfitted with state-of-the-art robotic equipment for performing nanotechnological techniques. Some of the on-going projects include:

- Antibiotic loaded nanocoatings for infection prevention
- Local delivery of IL-12 for infection prevention
- Drug-loaded nanocoatings for rapid fracture healing
- Innovative biomimetic coatings
- Polypeptide nanoparticles and microcapsules as sustained drug delivery vehicles

TESTING FACILITIES

The following equipment is readily available at the laboratory: MTS Servo hydraulic testing machine; hip simulator fixture to simulate single-legged stance and stair climbing loads with joint and abductor loading; laser displacement device, optical markers, and PC data acquisition systems; materials testing and evaluation laboratories.

2017 ACTIVE GRANTS: FACULTY

Shari Cui MD

- Title: Effects of telemedicine triage on efficiency and cost-effectiveness in spinal care
  Source: NASS Young Investigator's Award

Scott 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, multicenter study of instrumented posterolateral lumbar fusions (PLF) with OsteoAMP to evaluate long-term safety and efficacy in patients requiring 1-2 level instrumented PLF
  Source: Bioventus, LLC
- Title: M6-C Artificial Cervical Disc IDE Pivotal Study
  Source: Spinal Kinetics, Inc

Matthew J. Dietz MD

- Title: Orthopaedic implant related infection in West Virginia
  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

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 Foundation

David F. Hubbard MD

- Title: Fixation using alternative implants for the treatment of hip fractures
  Source: McMaster University

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: Use of tele-exercise as an alternative delivery channel for translating an evidence-based fall-prevention program into practice for older adults in West Virginia
  Source: CDC National Center for Injury Prevention and Control / West Virginia University Injury Control Research Center

Brock Lindsey MD

- Title: A prospective, post-market, multi-center study of tritanium acetabular shell
  Source: Stryker
- Title: Comparative effectiveness of pulmonary embolism prevention after hip and knee arthroplasty
  Source: Medical University of South Carolina

Bingyun Li PhD

- Title: Innovative implant nanocoatings with controlled dual drug release for bone regeneration
  Source: US DOD – Secretary of Defense

Ming Pei MD, PhD

- Title: Decellularized matrix and cartilage regeneration
  Source: US DHHS – NIH – National Institute for Arthritis, Musculoskeletal, and Skin Disease

2017 PUBLICATIONS: ORTHOPAEDIC SURGERY

Ames SE, Cowan JB, Kenter K, Emery S, Halsey D. Burnout in orthopaedic surgeons: A challenge for leaders, learners, and colleagues: AOA critical issues. J Bone Joint Surg Am. 2017 Jul 19; 99 (14): e78. DOI: 10.2106/JBJS.16.01215

Armstead AL, Simoes TA, Wang X, Brydson R, Brown A, Jiang BH, Rojanasakul Y, Li B*. (2017). Toxicity and oxidative stress response induced by nano- and micro-CoCrMo particles. J Mater Chem B

Belza B, Miyawaki CE, Allen P, King DK, Marquez DX, Jones DL, Janicek S, Rosenberg D, Brown DR. Building community: stakeholder perspectives on walking in malls and other venues. Journal of Aging and Physical Activity. Oct 2017: 25 (4): 510-524

Bostian PA, Karnes JM, Cui S, Robinson LJ, Daffner SD, Witt MR, Emery SE. Novel rat tail discitis model using bioluminescent Staphylococcus aureus. J Orthop Res. 2017 Sep; 35 (9): 2075-2081

Cheng H, Yue K, Kazemzadeh-Narbat M, Liu Y, Khalilpour A, Li B, Zhang YS, Annabi N, Khademhosseini A. Mussel-inspired multifunctional hydrogel coating for prevention of infections and enhanced osteogenesis. ACS Appl Mater Interfaces. 2017 Apr 5; 9 (13): 11428-11439

Chen S, Fu P, Wu H, Pei M. Meniscus, articular cartilage and nucleus pulposus: a comparative review of cartilage-like tissues in anatomy, development and function. Cell Tissue Res. 2017 Oct; 370 (1):53-70

Chen X, Li M, Yan J, Liu T, Pan G, Yang H, Pei M, He F. Alcohol induces cellular senescence and impairs osteogenic potential in bone marrow-derived mesenchymal stem cells. Alcohol Alcohol. 2017 May 1; 52 (3)

Cui S, Bauer J, Israel H, Mir H, Cannada LK. Bilateral tibial shaft fractures: a multicenter analysis. Current Orthop Practice. 2017 Jan; 28 (4): 365-370

Daigre J, Berlet G, Van Dyke B, Peterson KS, Santrock R. Accuracy and reproducibility using patient-specific instrumentation in total ankle arthroplasty. Foot Ankle Int. 2017 Apr; 38 (4): 412-418

Dietz MJ, Sprando D, Hanselman AE, Regier MD, Frye BM. Smartphone assessment of knee flexion compared to radiographic standards. Knee. 2017 Mar; 24 (2): 224-230

Emery SE. Filling the pipeline: AOA critical issues. J Bone Joint Surg Am. 2017 Aug 2; 99 (15): e83. DOI: 10.2106/JBJS.17.00131

Ernest EP, Machi AS, Karolcik BA, LaSala PR, Dietz MJ. Topical adjuvants incompletely remove adherent Staphylococcus aureus from implant materials. J Orthop Res. 2017 Nov 15

Joseph EG, Ernest EP, Dietz MJ. Complicated total knee arthroplasty in a patient with Klippel-Trenaunay-Weber Syndrome: A case report. JBJS Case Connect. 2017 Jul-Sep; 7 (3): e73

KX Xu, Y Liu, SB Bu, T Wu, Q chang, G Singh, X Cao, C Deng, B Li, G Luo, M Xing. (2017). Egg albumen as a fast and strong medical adhesive glue. Adv Healthcare Mater

Li B, Webster TJ. Bacteria antibiotic resistance: New challenges and opportunities for implant-associated orthopedic infections. J Orthop Res. 2017, Jul 19

Li J, Pei M. A protocol to prepare decellularized stem cell matrix for rejuvenation of cell expansion and cartilage regeneration. Methods Mol Biol. 2017, Apr 28

Lindsey BA, Markel JE, Kleinerman ES. Osteosarcoma overview. Rheumatol Ther. 2017 Jun; 4 (1): 25-43

McGough EL, Lin SY, Belza B, Becofsky KM, Jones DL, Liu M, Wilcox S, Logsdon RG. A scoping review of physical performance outcome measures used in exercise interventions for older adults with Alzheimer's disease and related dementias. J Geriatric Phys Ther. 2017 Nov 28

Narayanan K, Mishra S, Singh S, Pei M, Gulyas B, Padmanabhan P. Engineering concepts in stem cell research. Biotechnol J. 2017 Dec;12(12)

Pei M. Environmental preconditioning rejuvenates adult stem cells' proliferation and chondrogenic potential. Biomaterials. 2017 Feb; 117: 10-23

Santrock RD, Friedmann AJ, Hanselman AE. Acute rupture open repair techniques. Clin Podiatr Med Surg. 2017 Apr; 34 (2)

Sun Y, Wang TL, Toh WS, Pei M. The role of laminins in cartilaginous tissues: from development to regeneration. Eur Cell Mater. 2017 Jul 21; 34:40-54

Wang T, He J, Zhang Y, Shi W, Dong J, Pei M, Zhu L. A selective cell population from dermis strengthens bone regeneration. Stem Cells Transl Med. 2017 Jan; 6 (1): 306-315.

Wang T, Zhu L, Pei M. Insight into skin cell-based osteogenesis: a review. F1000 Res. 2017 Mar 17; 6:291. DOI: 10.12688/f1000 research.10280.1. eCollection 2017

Wardell R, Hanselman A, Daffner S, Santrock R. Posterior tibialis tendon rupture in a closed bimalleolar-equivalent ankle fracture: Case report. Foot and Ankle Specialist. 25 Apr 2017

Zhou L, Chen X, Liu T, Zhu C, Si M, Jargstorf J, Li M, Pan G, Gong Y, Luo ZP, Yang H, Pei M, He F. SIRT1-dependent anti-senescence effects of cell-deposited matrix on human umbilical cord mesenchymal stem cells. J Tissue Eng Regen Med. 2017 Jan 20

THANK YOU

Our growth and success of our clinical and research programs need investment for us to complete on the national stage. Please consider a gift to the Department of Orthopaedics for our WVU Foundation accounts. We utilize these funds for resident and faculty educational and research activities.

If you would like to designate a specific area for your gift, here are some suggestions:

1. Resident Research and Education
2. Faculty Research
3. Chair's Discretion

Credit card donations can be made directly online at give.wvu.edu/Orthopaedics.

If you choose to donate by check, please use the attached envelope for your convenience.

Any gift makes an impact. Thank you very much for your consideration.

Yours truly,

Sanford E. Emery MD, MBA

Professor and Chairman,
Department of Orthopaedics,
West Virginia University

Director of Surgical Services,
WVU Medicine