For the past 3 years, the Department of Orthopaedic Surgery has partnered with the Department of Biomedical, Chemical and Environmental Engineering in UC’s College of Engineering and Applied Science to develop patient-specific solutions for total hip arthroplasty.

Orthopaedic literature routinely demonstrates the sub-optimal positioning of hip implants using conventional techniques, instruments, and guides. Malpositioned implants lead to numerous complications including chronic pain, hip dislocation, leg length discrepancy, abnormal wear of the components, and ultimately failure requiring revision surgery.

By utilizing CT and/or MRI imaging, Todd Kelley, MD, assistant professor, envisioned an improved methodology for total hip replacement through patient-specific instrumentation. The technology would allow the surgeon to customize each surgery to the patient’s own anatomy. With grant support from the University Orthopaedic Research and Education Foundation, Kelley rallied a team together from Biomedical Engineering and Orthopaedic Surgery for an initial research experiment. Since then, Kelley continues to develop the technology with Vasile Nistor, PhD, Assistant Professor of Biomedical Engineering, Jacob Stegman, biomedical engineering graduate student, and Chris Casstevens, MD, orthopaedic resident. The work has lead to a University of Cincinnati Commercialization Award and U.S. and world patent submissions. The continued research will investigate the precision and accuracy of the devices in sawbones and cadavers, as well as automating processes from CT image collection to the 3D printing of the patient-specific instruments.

**Research Collaborations Build with Biomed Engineers**

*Efforts include patient-specific instrumentation to customize hip arthroplasty*

In a recent prototype study using cadavers, patient-specific guides generated by 3D printing were designed to optimize positioning of hip replacement implants.

### Additional Biomedical Engineering Research Collaborations

**TENDON ENGINEERING**

Keith Kenter, MD, professor of orthopaedic surgery, has long-term investigations with UC College of Engineering professors David Butler, PhD, and Jason Shearn, PhD, on tissue engineered constructs (TECs) to improve treatment for injured and repaired tendon and ligaments.

**ACL REAMER SYSTEM**

Bart Branam, MD, assistant professor of orthopaedic surgery, has been pursuing the design and development of an ACL reamer system in collaboration with Professor Balakrishna Haridas, PhD, in the UC College of Engineering, biomedical department.
From The Chair

As the academic year comes to a close, I am eager to update you on the exciting activities occurring in the Department. I am proud to announce that I have asked Dr. Keith Kenter and Dr. Bart Branam to take on leadership roles in the department, and they have accepted these positions. Dr. Kenter will serve as the Vice Chair of Academic Affairs for the department. Dr. Branam will serve as the Vice Chair of Clinical Operations. Both of these physicians will work with Ian Smith and myself to implement the strategies of the department and help fulfill our mission and vision.

The residency program continues to build a stronger national reputation, and our five Chief Residents (Jake Gunzenhaeuser, Nami Kazemi, Andy Millis, Kat Schroeder and Shawn Yang) graduated on June 12th at the Cincinnati Country Club. We are sad to say goodbye, but very proud of them as they become new members of the Freiberg Society! We wish you well and look forward to seeing you at future AAOS Freiberg reunions. The department welcomes our new class of Interns (John Fritch, Andrew Jen, Raf Kakazu, Tara Nagaraja and Melissa Summers) to the program in late June. This is an exceptional class, and I am confident they will continue the long standing tradition of excellence that our residents exemplify. Additionally, the department has recruited our fifth trauma fellowship trained faculty member. Frank Avilucea, MD, will be joining the Trauma Division in August. He completed his residency at the University of Utah and is finishing his trauma fellowship at Vanderbilt University. Frank has stellar credentials and will help carry the Trauma Division to a higher level of national prominence.

In order to foster our academic growth, the department has invested into a relationship with the College of Medicine’s Bioinformatics Department as well as the epidemiology group at Cincinnati Children’s Hospital Medical Center (CCHMC). This initiative will have three major areas of focus: 1) the study of perioperative orthopaedic complications in diabetic / obese patients, 2) prospective functional outcomes for shoulder, hip and knee athletic injuries, and 3) sports-related traumatic brain injury—diagnosis, treatment and prevention. Other areas of the department will engage with the informatics team as well, but these three areas of emphasis will leverage strengths already present within the UC College of Medicine.

In terms of programmatic development, a multidisciplinary bone metastatic disease program is planned to launch this summer. This is a cooperative effort between Orthopaedic Surgery, Radiation Oncology, Oncology and Radiology to provide a comprehensive care program for patients in the greater Cincinnati catchment region who develop metastatic disease to bone. The program was developed to provide advanced specialty services as needed for patients, yet allow them to remain in their community for care and services that are available there. The goal is for patients to be evaluated and have a treatment plan within 48 hours of referral.

Additionally, the Department is working collaboratively between UC Health and CCHMC to develop a limb deformity and correction program. This effort will be led by Drs. John Wyrick and Jim McCarthy. Future collaborations will include providers from both institutions who will focus on providing care for hip pathology including periacetabular osteotomy, hip arthroscopy and hip arthroplasty.

In regard to development, the department has been the benefactor of several very generous gifts over the last several months. Dr. Edward Miller, the first departmental chair, and his wife Carol have endowed an annual lecture for the department in order to engage orthopaedic leaders from around the country and world to visit Cincinnati and the department. In a similar manner, Dr. Richard Freiberg has committed an endowment to support the annual Freiberg Family Lectureship which debuted in the winter of 2014 with an inaugural combined lecture on the history and future of hip arthroplasty given by Drs. Richard and Andrew Freiberg. Additionally, Dr. Freiberg has committed funds to supporting the biannual newsletter with the goal to publish one edition annually in the form of a departmental journal. Look forward to the first edition toward the end of 2015.

As you can see, the department continues to grow and expand in every domain. We are excited for the future of the department as it looks bright. Please keep in touch and consider supporting our mission of education and research through the Freiberg Society, gifts and endowments.

Michael T. Archdeacon, MD, MSE
Peter J. Stern Professor and Chair
Department of Orthopaedic Surgery
Concussion in Sports is Topic of Community Education Outreach Event

The University of Cincinnati Sports Neuroscience Initiative offered “Fear and Concussions—Training to Stop It,” a free, public program about concussion in contact sports. The half day program, held in June at UC, was geared toward middle and high school coaches, athletic trainers, parents and athletes. It provided training, hands-on exercises and a preview of some of the innovations being developed by UC researchers and engineers.

The UC Sports Neuroscience Initiative includes the Department of Orthopaedic Surgery’s Division of Sports Medicine, the Department of Psychiatry and Behavioral Neuroscience and the Department of Neurology and Rehabilitation Medicine. It was formed in 2014 to achieve research breakthroughs that will enhance student-athletes’ health and safety. Jon Divine, MD, professor of orthopaedic surgery, is the initiative’s director.

Sessions at the public program “Fear and Concussions—Training to Stop It,” touched on a variety of topics.

• **Fear and Concussions**
  This session met the Ohio Department of Health annual coaching education requirement and covered defining concussions, concussion facts, concussion and kids and Ohio’s Return-to-Play Law. Cedric Peerman, special teams captain for the NFL Cincinnati Bengals, provided a player’s perspective of going through the concussion protocol, and vision training for injury prevention.

• **Interactive Training**
  Topics covered included sideline diagnosis, balance checks, rehabilitation techniques, post-injury management, vision training techniques and prevention training.

• **Protecting Brains of the Future**
  This session showcased innovations from a number of UC colleges, such as concussion biomarkers from the College of Medicine, concussion research from the College of Engineering and Applied Science, futuristic helmet designs from the College of Design, Architecture, Art and Planning (DAAP) and projects from DAAP and the College of Nursing.

“‘There is a lot of fear associated with concussions in sports, and yet there are ways to help keep athletes safe from concussion,’ says Divine, who is also UC’s head team physician.

Divine Installed as President of Sports Medicine Society

Jon Divine, MD, Professor of Orthopaedic Surgery, Division of Sports Medicine, was installed on April 18th, 2015, as president of the American Medical Society for Sports Medicine (AMSSM) during its 24th Annual Meeting in Hollywood, Florida. Divine served on the AMSSM Board of Directors from 2008-12 and has served the past two years on the AMSSM Executive Committee. In 2008, he was Program Chair for “Rendez-Vous,” a joint Annual Meeting of AMSSM and the Canadian Academy of Sport and Exercise Medicine.

Concussion Research Initiative Holds Session

The UC Sports Neuroscience Initiative held the fifth session of its Sports Concussion Clinical Research Initiative, drawing together investigators involved in sports concussion research across departments and disciplines. Attendees to the session, held the day prior to the public concussion program (see adjoining article), heard news and updates from investigators. The two projects awarded Sports Health Innovation Award funding in January 2015 were “Prediction of Symptom-free Traumatic Brain Injury using Standard Clinical MRI,” with collaborating departments Psychiatry and Behavioral Neuroscience, and Aerospace Engineering and Engineering Mechanics; and “Assessing Return-To-Play in Athletes with Mild Traumatic Brain Injury Using The KINARM,” a collaboration of the Electrical Engineering and Computing Systems Department in the UC College of Engineering and Applied Science and Orthopaedic Surgery Division of Sports Medicine. Updates were followed by the introduction of new, interested investigators. A roundtable discussion and brainstorming session for collaborative projects ended the session.

“We look forward to meeting and sharing ideas, with the goal of becoming a powerful, unified collegiate research team that leads the country in sports concussion research,” said Sports Neuroscience Initiative Director and Professor of Orthopaedic Surgery Jon Divine, MD.
Department Goes “Whole Hog” into Cincinnati Flying Pig Marathon

Cincinnati held the 17th annual Cincinnati Flying Pig Marathon event in May 2015 and Jon Divine, MD, Professor of Orthopaedic Surgery, Sports Medicine division, again served as the medical director. He has been event’s medical director since 2005.

The field for the event totaled 37,770 registrations. Participants this year represented all 50 states and 22 countries.

When it comes to being ready for the Flying Pig Marathon, to say that Dr. Jon Divine and his sports medicine team are prepared might be an understatement.

“At our main medical tent, we’ll have about 60 (medical professionals), and we’ll have about 10 in the Yeatman’s Cove area, where we have another first aid minor medical tent,” he said.

And that’s not including the emergency personnel you’ll see when you’re on the go during the actual race.

It’s what the team of 250 medical professionals prepares for all year long.

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“We have, right now, five mobile vans that we have staffed with basic life support characteristics with registered nurses that can go out to a station and bring (patients) back in to us,” Divine said.

In order to be able to offer such service, the crew not only revisits each marathon experience starting immediately after the previous Flying Pig, but also endures some pretty rigorous training simulations.

“From somebody choking in the crowd, to two people having heart attacks at the same time at the finish line, so extreme examples like that, we hope not to see, but we kind of want to be prepared in case it does,” Divine said.

And even in rare cases, such as the 2007 marathon when someone collapsed and died after the race, the team uses that experience as a lesson.

“In all sense of the word, it was just really going back and re-rehearsing and doing the things that we did right, and make sure we’re doing that every year. And so far, we’ve been pretty fortunate,” Divine said.

This year, body temperatures of some runners were over 106 degrees; the highest was 108.2. Eight to 10 runners need to be put in ice baths.

There were about 190 volunteers of which 120 were UC and UC Health employees.
Vice Chairs Named in Department

Two faculty will be taking on newly created leadership roles in the department.

Keith Kenter, MD, will serve as Vice Chair of Academic Affairs for the department and Bart Branam, MD, has been appointed Vice Chair of Clinical Operations for the department.

Kenter came to UC in 2002, moving through the ranks to attain full professor in 2015. He has served as Orthopaedic Residency Program director for more than a decade. Most recently, the program achieved a five year resident ACGME accreditation with no citations and a letter of commendation. Recognized as the regional expert in complex shoulder surgery, Kenter has been named as one of the top 28 North American Shoulder Surgeons.

Branam, a 2007 UC orthopaedics residency graduate and now assistant professor, is board certified in orthopaedic surgery with a subspecialty in sports medicine. His clinical specialization includes foot and ankle, knee injury/pain and joint replacement. He serves as team physician for several Cincinnati area high schools as well as UC Athletics.

The Vice Chairs will work closely with Chair Michael Archdeacon, MD, and Ian Smith, executive director, business administration, to implement department strategies.

Crawford Recognized with Honorary Degree

Alvin Crawford, MD, professor emeritus of orthopaedic surgery, received the degree of professor of the department of medicine, honoris causa, from the University of Ioannina, Greece, in an April ceremony. Crawford, world renowned for his advances in pediatric spine surgery, was presented with the degree and the academic dress of the University of Ioannina, delivered a presentation “Investigating the Musculoskeletal Mysteries of von Rechlinghausen’s Disease in Children,” and then surprised the audience with a performance of jazz on his clarinet.

Welcome to the 2015-16 Residents

The department welcomes the new class of residents to the program. We are pleased to have them join us.

Congratulations…

Graduating University of Cincinnati Medical Students Matching Into Orthopaedics

- Stephen Berling—Mount Carmel Medical Center, Columbus, OH
- Andrew Clair—NYU Medical Center, New York, NY
- Nicholas Dantzker—Vanderbilt University Medical Center, Nashville, TN
- Jonathan Edgington—University of Chicago Hospitals, Chicago, IL
- Lauren Fader—University of Louisville, Louisville, KY
- Joseph Herron—University of Toledo College of Medicine, Toledo, OH
- Rachelle Metz—St. Louis University Hospital, St. Louis, MO
- Ifeanyi Nzegwu—University of Kentucky Medical Center, Lexington KY
- Robert Petit—Ohio State University Hospital, Columbus, OH

Patrick Whitlock, MD, PhD, has joined the University of Cincinnati as assistant professor in the Department of Orthopaedic Surgery and pediatric orthopaedic surgeon at Cincinnati Children’s Hospital Medical Center. He earned his medical degree at Drexel University and then completed a PhD in engineering at UC. Whitlock completed residency training at Wake Forest. His clinical interests include hip preservation; SCFE, developmental dysplasia of the hip; Legg-Calve-Perthes disease; and femoro-acetabular impingment. Research interests include regenerative medicine; biomaterials; musculoskeletal development; naturally-derived tissue scaffolds; and clinical outcomes research.

Whitlock Joins UC

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Participants in Medical Mission Trip Provide Service as Well as Education

In the Indian culture, when a person goes to the hospital for surgery, their family and friends go with them.

“The pre- and post-operative waiting areas can be a bit crowded, but that’s their support system. When you interact inside another culture, it helps to understand when you treat your own patients at home from the same culture,” Assistant Professor of Orthopaedic Surgery and UC Health Orthopaedic Hand Surgeon Micah Sinclair, MD, says of taking part in a 2015 medical mission trip to Ahmedabad, India.

The mission trip, the third of its kind in as many years, provides free surgical treatment to children with complex spine and upper extremity deformities. The trip is organized by Shital Parikh, MD, a pediatric orthopaedic surgeon at Cincinnati Children’s Hospital Medical Center. Parikh is a native of Ahmedabad and conducted both his medical training and orthopaedic surgery residency at the Sheth V.S. General Hospital there. This year, Parikh organized a team of five surgeons, two anesthesiologists and three support personnel who spent a week in Ahmedabad performing complex spine and hand procedures.

“There are more patients per doctor than you can treat, and there’s a lack of resources, making the number of surgeons who can do these types of specialized surgeries very, very limited,” Parikh says. He added that although the hospital there has a full-scale intensive care unit, on-site MRI capabilities, and a blood bank, the majority of medical treatments in India are for trauma and infection.

“Our thinking is that if we do it repeatedly and exchange some knowledge, skill and expertise, then some of the surgeons who are training now can do this in the future,” says Parikh. “A lot of the hand surgery in India is done by plastic surgeons so this is also an educational opportunity for the orthopaedic surgery residents there,” says Sinclair. The majority of patients Sinclair treated were children with cerebral palsy who benefitted from surgery to improve upper extremity function.

The team members donate their time and expertise, each paying for their own expenses. They rely on generous donations to perform these complex surgeries, Parikh says, giving kudos to Allosource, Medtronics, and Evokes Inc., for providing the bone grafts, spinal implants and neuromonitoring supplies and equipment to perform the surgeries, respectively.

The hand team, which included Sinclair and Kevin Little, MD, from Cincinnati Children’s, examined more than 50 children with upper extremity deformities. Some of the children received recommendations for braces, physical therapy and Botox injections. Twelve were admitted for surgical correction of deformities related to varied conditions including brachial plexus injury, cerebral palsy and arthrogryposis. Meanwhile, seven children with severe spine deformities were brought to the hospital from the city and nearby villages. They were operated on by the spine surgeons Peter Sturm, MD, and Viral Jain, MD, also from Cincinnati Children’s.

“It’s unlikely that they would have had the opportunity for the surgery unless a similar group like ours had come,” says Sinclair, who added “these trips provide a wonderful opportunity for both service for people in need as well as collaborative education for the surgeons.”

Written by Angela Koenig

Robert Burger, MD, and his son now have a championship honor in common. Burger, a UC College of Medicine alumna (’85) and orthopaedic residency graduate (’90), was a member of the championship 1977 Notre Dame team. This year, his son Joe was a junior linebacker on the championship Ohio State Buckeyes.

Burger currently serves as head team physician at Xavier University in Cincinnati.

ALUMNI NEWS AND UPDATES

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ALUMNI: We want to hear from you! Please send any news-related items to the editor, Shelley Hess, at shelley.hess@uc.edu. Thank you.
**NEWS BRIEFS**

**Archdeacon Named ‘Clinical MVP’ by UC Health**

Michael Archdeacon, MD, professor and chair, was presented with UC Health’s Clinical MVP award by CEO Lee Ann Liska in March. The award is given to an attending physician who has a highly productive clinical practice who also maintains excellent clinical outcomes and high patient satisfaction, making a significant contribution to inpatient, outpatient, and/or procedural patient care, quality, and patient experience at UC Health.

**Stern Gives Osgood Lecture**

Peter Stern, MD, professor of orthopaedic surgery, returned to his alma mater, Harvard University, on June 12 as the invited Osgood Lecturer. Stern presented “Man’s Inhumanity to Man” as the kickoff of the graduation day event to the Harvard Combined Orthopaedic Residency Program.

**Crawford Keynotes Commencement; Honored by Courier**

Alvin Crawford, MD, professor emeritus, was the Commencement Keynote Speaker for the 2015 graduating medical students at the University of Tennessee Health Science Center College of Medicine on May 29, 2015. Crawford is the college’s first African-American graduate.

Crawford also received the 2015 Health Care Heroes Lifetime Achievement Award from the Cincinnati Business Courier. One of the world’s top spine specialists, Crawford joined Cincinnati Children’s in 1977 as director of orthopaedic surgery and remained chief for 29 years. He has made the list of the country’s best doctors each year since 1996.

**Sturm Earns MBA**

Peter Sturm, MD, professor, recently completed an MBA from Kellogg School of Management at Northwestern University. “The time commitment is enormous,” he commented. “That said, I would definitely do it again. I think stepping outside of your comfort zone and challenging yourself intellectually is important.”

**Promotion Received**

Donita Bylski-Austrow, PhD, received reappointment and promotion to Adjunct Research Professor in Orthopaedic Surgery as this cycle completes.

**SPORTS MEDICINE DIVISION UPDATES**

**Donaworth Receives Young Investigator’s Award**

Michael Donaworth, MD, Assistant Professor of Orthopaedics, Division of Sports Medicine, received the Harry Galanty Young Investigator Award at the American Medical Society for Sports Medicine 2015 Annual Meeting for his research titled “The Use of Vision Training as a Means of Decreasing Concussion Incidence in Football.” This award is presented at the Annual Meeting for the most outstanding research presentation by a member who is a sports medicine fellow or who has recently completed fellowship training.

**First Orthopaedic Sports Medicine Fellow Begins**

Krishna Reddy, MD, is the sports medicine fellow, the first since the program — focused exclusively on orthopaedic sports medicine — received accreditation in January of this year. Reddy comes from the Orthopaedic Oncology Fellowship program at Vanderbilt University Hospital, Nashville, Tennessee.

**SAEM Presentation**

John Childress, MD, primary care sports medicine fellow, presented at the Society for Academic Emergency Medicine 2015 annual meeting in May.

**Primary Care Sports Medicine Fellowship Update**

Outgoing primary care sports medicine fellows have announced their plans.

Abigail DeBusk, DO, will be heading to Greenville, South Carolina, to practice in the Greenville Health Systems. She will be part of Laurens Family Medicine and will be practicing family medicine and sports medicine.

John Childress, MD, will be heading to Miami, Florida, to practice at Aventura Hospital. He will be taking on an academic emergency medicine role and starting a sports medicine program for the hospital.

The department thanks both fellows for their service and wishes them well in their careers.

The department welcomes Keith Burley, MD, and Ahmed Khan, MD, to the fellowship. Burley comes from the Emergency Medicine residency program at the University of Wisconsin Hospital and Clinics in Madison. Khan hails from the University of South Carolina (Columbia) Family Medicine residency program.
The University of Cincinnati Department of Orthopaedic Surgery provides this news and updates for its alumni, current members and supporters.

For information, contact the editor, Shelley Hess, at shelley.hess@uc.edu