



Jacobs School of Medicine and Biomedical Sciences  
**Department of Orthopaedics**  
 University at Buffalo

## RESEARCH NEWSLETTER

### Message from the Department Chair



It has been a productive year for research in Orthopedics! Highlights of the last year include the concussion group, led by Dr. John Leddy, publishing in JAMA Pediatrics and getting an editorial devoted to their research in the Buffalo News. John and his colleagues continue making us proud, and have established UB as a world leader in innovative concussion research. Clinicians and patients travel to Buffalo from around the world to learn about the most advanced concussion treatment, and to get treatment themselves.

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Our basic science investigations continue to bear fruit, with promising new ways to prevent and treat implant infections developed by Dr. Mark Ehrensberger's team in The Kenneth A. Krackow, MD Orthopedic Research Laboratory catalyzing the launch of a startup company devoted to treating infected implants.

In the arena of clinical research, UBMD Orthopaedics and Sports Medicine is the leading recruitment site for a \$5 million NIH study to determine the optimal non-operative treatment for degenerative meniscal tears, with Melissa Kluczynski, MS and her team impressing our collaborators with their efficiency and excellence. Our clinical outcomes registries continue to grow as well, with 6000+ patients in our ECMC fracture database, 2000+ in our ACL registry, and Knee Arthroplasty, Shoulder Arthroplasty, and Trauma/Sarcopenia databases continuing to add patients. Credit goes to Sonja Pavlesen, MD, MS, Melissa Kluczynski, MS, Mary Bayers-Thering, MSA, MBA, Laura Ryan, MPH, and Lin Feng, MA, CCRC for creating registries that are leading to inter-departmental collaborations with General and Trauma Surgery, Pediatrics, and Emergency Medicine, among others.

Residency graduation in June showcased outstanding research projects by multiple residents, with a steady growth in the quality of the presentations. Additionally, Dr. Bob Ablove and his associates have continued to expand the medical student research program, with a record 22 students participating this summer and presenting their results in July.

While we should be proud of these wins, our Department also experienced some loss this last year. Eugene R. Mindell, MD passed away, over 50 years after becoming the first full-time orthopedic faculty member and Chair. He attended every residency graduation up to his passing, and remained an engaging conference attendee and magnetic social and dinner companion his entire life. Those of us familiar with Gene will sorely miss him, and he can't be replaced.

In closing, thanks to all faculty and staff who participated in making our research year so great. We owe our success to you all, and look forward to seeing how you'll continue following the compass needle of our research mission to perform "innovative research to discover, develop, and deliver treatment!"

-Les

**Leslie Bisson, MD**  
**June A. and Eugene R. Mindell, MD, Professor and Chair**  
**Jacobs School of Medicine and Biomedical Sciences**  
**University at Buffalo**

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# Congratulations

**Congratulations to this year's Orthopaedic Residency Program Graduates!**

**Andrew Baron, MD**

**Alexander Boiwka, MD**

**Kathleen Boyle, MD**

**Tyler Miller, MD**

**Nicholas Valente, MD**

**Congratulations to the 2019 Research Award Recipient!**

**Kathleen Boyle, MD**

**Project: "Blue Light Reduces *Cutibacterium (Propionbacterium) acnes* Bacterial Burden: Orthopaedic Shoulder Infection Prevention"**

**Presented at: 13<sup>th</sup> Annual Eugene R. Mindell, MD Orthopaedic Residency Scientific Program**



1846



Dr. Mindell graduated with his medical degree from the University of Chicago in 1945 before joining the U.S. Navy to serve with the Veterans Administration from 1945-46. Following his discharge, he returned to Chicago for his residency and began his lifetime of work focusing on the diagnosis and treatment of bone cancer, working alongside leading researchers at the University of Chicago. His drive to improve treatments and reduce mortality rates led to the opening of the Orthopaedic Bone Pathology Laboratory, developed and opened at UB under his tenure as chair in 1967, expanding the opportunities for researchers and medical students to better understand the structures of bone tumors and orthopaedic oncology.

Dr. Mindell remained active in medicine even after his retirement as chair in 1988, and continued to be an active leading researcher in orthopaedic oncology. In fact, he was published as the lead researcher on more than 100 scientific papers throughout his career and saw the survival rate for osteosarcomas improve from 20 percent to around 70 percent during his lifetime. He saw and participated in the development of new approaches that helped reduce limb loss from bone cancers and saw mortality rates for cancer patients improve through the use of new sciences and technologies such as chemotherapy, which started as a new

procedure in the 1970s and has become an integral part of many treatments still today.

He also worked as a leader to guide young doctors in their study of orthopaedic medicine well into his retirement, continuing to work to improve students' knowledge of orthopaedics and the educational standing of the university as a whole.

Dr. Mindell was also honored with several accolades for his continued work in advancing orthopaedic medicine. In 1986, he received the Dean's Award from UB's Medical School, and was honored with the Distinguished Service Award from his alma mater, the University of Chicago, in 1990. He also received the Achievement in Health Care Award from D'Youville and the Lifetime Achievement Award from UBMD Orthopaedics & Sports Medicine, both in 2002. In recent years, Dr. Mindell was honored by the Medical Society of the County of Erie with its Distinguished Service Award in 2012, recognizing his extensive career in advancing medical science and technology.

A giant in the field of orthopaedics, Dr. Mindell's contributions to medicine – not only here in Buffalo, but for physicians, hospitals and patients around the world – cannot be overstated. Our faculty, our students and our patients have truly suffered a loss and we can only hope to continue to advance medical study and practice in his same spirit.

## Upcoming Deadlines

### Abstract Deadlines:

Orthopaedic Research Society (ORS)  
2020 Annual Meeting  
Currently Open / Deadline: **August 26, 2019**

Pediatric Orthopaedic Society of North America (POSNA)  
2020 Annual Meeting  
Opens: September 2019/ Deadline: **TBA**

American Orthopaedic Society for Sports Medicine (AOSSM)  
2020 Annual Meeting  
Currently Open / Deadline: **September 3, 2019**



### Grant Deadlines:

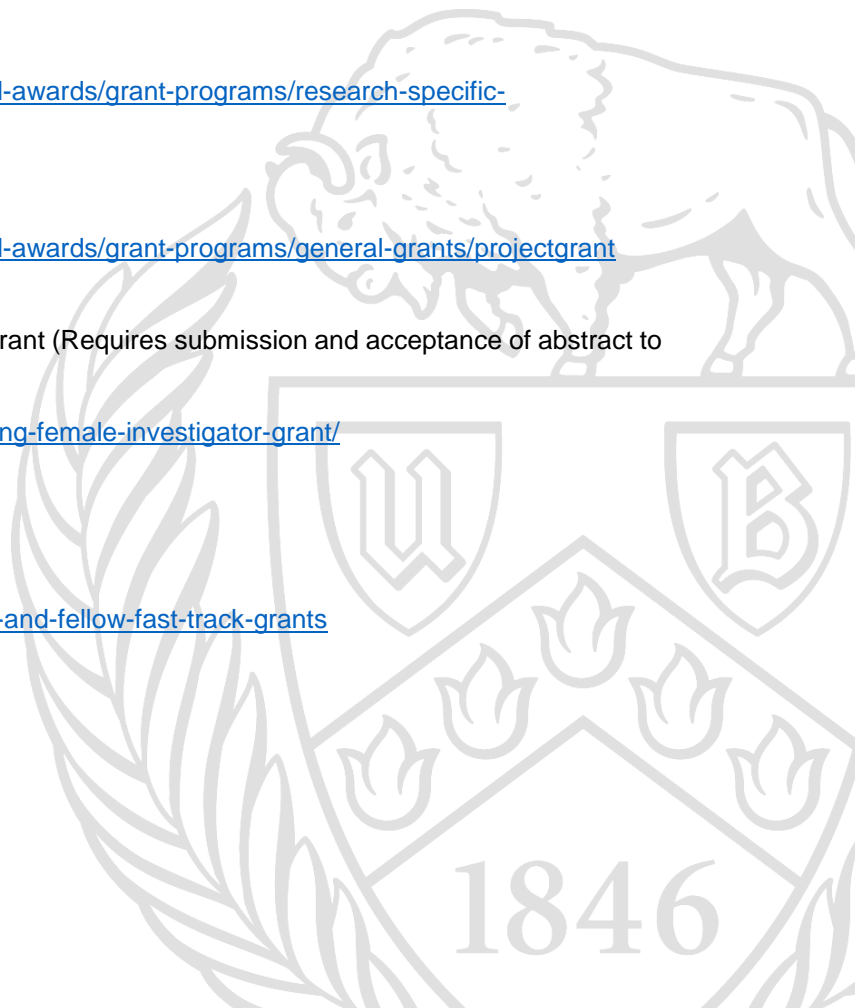
OREF (Orthopaedic Research and Education Foundation)  
OREF/ASES/Rockwood Clinical Research Grant in Shoulder Care  
\$50,000  
Deadline: **9/5/19**  
<https://www.oref.org/grants-and-awards/grant-programs/research-specific-grants/RockwoodShoulder>

The OREF Impact of Regulatory Policies on the Patient-Physician Relationship Research Grant in Honor of Sigvard Hansen, MD  
\$75,000  
Deadline: **9/5/19**  
<https://www.oref.org/grants-and-awards/grant-programs/research-specific-grants/Policies>

Resident Research Project Grant  
\$5,000  
Deadline: **9/5/19**  
<https://www.oref.org/grants-and-awards/grant-programs/general-grants/projectgrant>

ORS  
ORS/RJOS Young Female Investigator Grant (Requires submission and acceptance of abstract to ORS annual meeting)  
Currently Open  
<https://www.ors.org/orsrjos-young-female-investigator-grant/>

American Foundation for Surgery of the Hand  
Resident and fellow fast track grant  
\$5,000  
Deadline **9/9/19**  
<https://www.afsh.org/s/resident-and-fellow-fast-track-grants>





## In the News

### TEMPO Trial

We are currently recruiting subjects for a NIH-funded multi-center (lead center: The Brigham and Women's Hospital) randomized controlled trial, the TEMPO (Treatment of Meniscal Problems and Osteoarthritis) Trial. Drs. John Leddy and Leslie Bisson are the local co-principal investigators, and Pete Tonsoline, PT, ATC and Brian DeLuca, PT are the lead physical therapists for the trial. The study team also includes Melissa Kluczynski, M.S. (study coordinator), Heather Albanese, and Kathleen Lafferty (research assistants). Many thanks to all study personnel and to the offices of Drs. Bisson, Wind, Fineberg, Bernas, Rauh, Freitas and Marzo for making this study a success. To date, we have enrolled over 170 patients (about half of our target sample)!

first scientific evidence of an effective treatment for acute sport-related concussion.

We also published two papers on a brief but pertinent physical examination for concussion to be used by family physicians and pediatricians. We derived and validated a cycle ergometer version of the Buffalo Concussion Treadmill Test (called the "Buffalo Concussion Bike Test"). We are currently replicating our RCT of early exercise treatment for sport-related concussion in a national multicenter trial and our NIH-RO1 study is investigating the systemic pathophysiology of concussion, with a focus on identifying Autonomic Nervous System and cardiopulmonary dysfunction after concussion. These studies will help inform the development of reliable diagnostic tools for concussion diagnosis and recovery and perhaps new approaches to treatment.

### Concussion Research

The Concussion Management Clinic and Research Center has had a productive year. We



published results from a three-year project, called the Healthy Ageing Mind project, that did not find an association between playing professional contact sports and an increased risk of developing neurocognitive difficulties later in life. We published several companion papers about this project in the Journal of Head Trauma Rehabilitation and received national media coverage.

Our treatment trial comparing a prescription of sub-symptom threshold aerobic exercise to a placebo-stretching program was completed and published in JAMA Pediatrics. The study found light to moderate exercise reduced duration of symptoms and may reduce the incidence of persistent post-concussion symptoms. This is the

### Basic Science

The mission of the basic science research program is to improve human health by enhancing the quality, longevity, and functional performance of orthopaedic implants and surgical instruments. Our research efforts are focused in two areas that directly support this mission. Our metallic orthopaedic biomaterials research seeks to characterize and engineer the biological and electrochemical interactions at the surface of metallic orthopaedic implants. Our applied orthopaedic biomechanics research aims to develop novel mechanical test methods to evaluate the performance of hard and soft tissue repair techniques and orthopaedic devices.

The basic science program continues to successfully expand upon our tradition of excellence in these research areas. Our research is currently supported by \$1.9M in active grant funding from federal, state, foundation, and industry sponsors. In the past year have published 4 journal manuscripts, presented 6 conference abstracts as podium talks, given 2 invited talks, and co-chaired an international

symposium on electroactive biomaterials for infection control.

We are currently engaged in a wide range of multidisciplinary research projects that include optimizing electrical stimulation parameters for infection control, characterizing microenvironmental effects of electrical stimulation in biological systems, developing infection sensing and implantable electrical stimulation devices, assessing electrically enhanced osseointegration, testing the biomechanics of reverse and anatomic total shoulder prostheses, evaluating stability of new flexible nailing configurations, and developing designs and systems for 3D printing of prosthetics limbs.

One of the biggest keys to our successful basic science research program is the dedicated team of basic science staff, students, residents, faculty, and collaborators that pursue research within the Kenneth A. Krackow MD, Orthopaedic Research Laboratory. This year it is with deepest gratitude that we give special recognition to ***Craig Howard for his retirement after 38 years of dedicated service as a research scientist in the Department of Orthopaedics.*** Craig has made many significant contributions to the research and education mission of the department. His research excellence, technical know-how, and ingenuity has been a cornerstone of our basic science research and has provided us a strong foundation to build upon. We are grateful that Craig will remain involved in our basic science research efforts as a part time consultant.

## Medical Student Summer Research Program

On June 5, a record number of 22 first-year medical students embarked on the 9-week UB

Orthopaedics Department Summer Research Program. The program has an enriching and focused curriculum that promotes access to hands-on basic biomedical, translational, and clinical research to students who have completed their first year of medical school, focused in orthopaedics. Faculty mentors and research staff train and supervise each student on a project. In addition, weekly seminars given by experts in the field cover topics in clinical research fundamentals, biostatistics, literature searches, research compliance and human subject protections, trial design, and developing scientific presentations and publications. At the conclusion of the program, students give a presentation about their research and receive a Certificate of Completion for their participation.

Initiated in 2014 by Dr. Robert Ablove, the program provides scholars with the opportunity to participate in research and enhances career building skills required for successful entrance into residency. For the first time in the program's history, 10 Chairman's Grants of \$750 each were made available and awarded to successful applicants. "I'm so proud of how this program has grown. It's very encouraging to see such enthusiasm at the start of what will be wonderful careers." said Dr. Ablove. For more information about the UB Orthopaedics Department Summer Research Program, contact Lin Feng, program coordinator, at 716-248-1756 or lfeng3@buffalo.edu



## Funding Announcements

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Boyle K (PI), Duquin T, Crane J. Blue Light Reduces Cutibacterium (Propionibacterium) acnes Bacterial Burden. OREF Resident Research grant \$5000. 2019-present.

Ehrensberger MT (PI). Electrical Stimulation Device for Orthopedic Infection Control. Industry Partner: Garwood Medical Devices. Technology Transfer Incentive Program, Empire State Development (\$124,862 total costs). Effective Dates: 6/1/2019-12/31/2020.

Ehrensberger MT and Duquin TD (Co-PIs). Reverse Baseplate Fixation with Bone Loss Extension. Zimmer-Biomet (\$11,800 total costs). Effective dates: 2/1/2019-8/30/2019.

Leddy (PI). DoD FY18 PH/TBIRP CTRR – Clinical Trial Development Award. “Exercise Tolerance Testing and Progressive Return to Activity Treatment - Modifying the Buffalo Concussion Assessment and Treatment Protocol for Application in a Military Environment.” 10/19-9/20. \$200,000. Partner with DVBIC and University of North Carolina.

Johnson (PI) UB Clinical and Translational Science (CTSA) Pilot Grant. 4/1/19-3/30/20. “Water Immersion and Objective Biomarkers for Concussion Management.” \$40,085 Role: Dr. Leddy Co-Investigator

## 2019 Publications & Presentations

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### *Congratulations to all authors!*

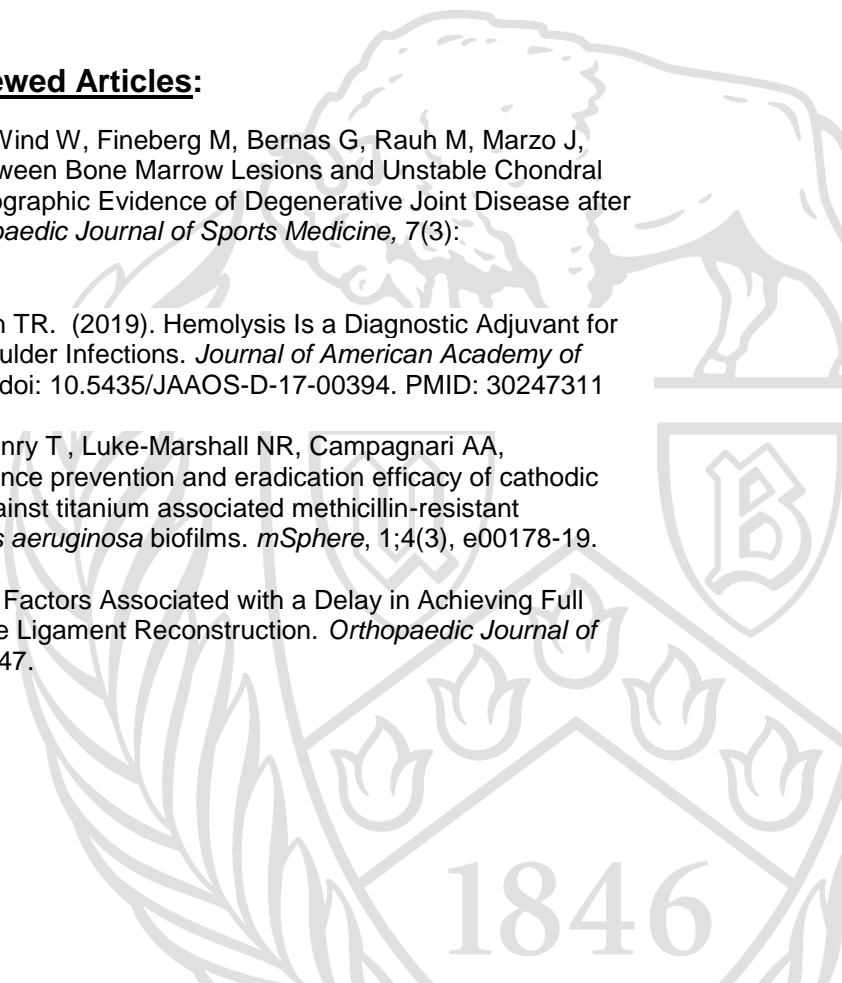
#### **Peer-reviewed Articles:**

Bisson L, Phillips P, Matthews J, Zhou Z, Zhao J, Wind W, Fineberg M, Bernas G, Rauh M, Marzo J, Kluczynski M. (2019). The Association between Bone Marrow Lesions and Unstable Chondral Lesions and Pain in Patients without Radiographic Evidence of Degenerative Joint Disease after Arthroscopic Partial Meniscectomy. *Orthopaedic Journal of Sports Medicine*, 7(3): 2325967119830381.

Boyle KK, Nodzo SR, Wright TE, Crane JK, Duquin TR. (2019). Hemolysis Is a Diagnostic Adjuvant for *Propionibacterium acnes* Orthopaedic Shoulder Infections. *Journal of American Academy of Orthopaedic Surgeons*. 15;27(4):136-144. doi: 10.5435/JAAOS-D-17-00394. PMID: 30247311

Canty MK, Hansen LA, Tobias ME, Spencer S, Henry T, Luke-Marshall NR, Campagnari AA, Ehrensberger MT. (2019). Antibiotics enhance prevention and eradication efficacy of cathodic voltage-controlled electrical stimulation against titanium associated methicillin-resistant *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms. *mSphere*, 1;4(3), e00178-19.

Gage A, Kluczynski M, Bisson L, Marzo, J. (2019). Factors Associated with a Delay in Achieving Full Knee Extension Prior to Anterior Cruciate Ligament Reconstruction. *Orthopaedic Journal of Sports Medicine*, 7(3): 2325967119829547.



- Haider MN, Johnson SL, Mannix R, Macfarlane AJ, Constantino D, Johnson BD, Willer BS, Leddy JJ. (*In press*). The Buffalo Concussion Bike Test for Concussion Assessment in Adolescents. *Sports Health*.
- Haider MN, Leddy J, Baker JG, Kiel JM, Tiso M, Ziermann KA, and Willer B. (*in press*). Effect of Specialized Concussion Management Training among Residents and Medical Students. *Concussion*.
- Haider MN, Leddy JJ, Wilber CG, Viera KB, Bezherano I, Wilkins KJ, Miecznikowski JC, Willer BS. (2019). The predictive capacity of the Buffalo Concussion Treadmill Test after sport-related concussion in adolescents. *Frontiers in Neurology*. PMID: 31105634
- Haider MN, O'Donnell K, Bezherano I, Horvath PJ, Leddy JJ, Willer BS. (*In press*). Retired Professional Contact Sport Athletes are more sedentary and consume fewer brain healthy nutrients than Non-contact Sport Controls. *JSM Sports Medicine and Research*.
- Harmon KG, Clugston JR, Dec K, Hainline B, Herring S, Kane SF, Kontos AP, Leddy JJ, McCrea M, Poddar SK, Putukian M, Wilson JC, Roberts WO. (2019). American Medical Society for Sports Medicine position statement on concussion in sport. *British Journal of Sports Medicine*; 53:213–225. doi:10.1136/bjsports-2018-100338
- Johnson BD, Sackett JR, Schlader ZJ, & Leddy JJ. (*In press*). Attenuated Cardiovascular Responses to the Cold Pressor Test in Concussed College Athletes. *Journal of Athletic Training*.
- Kent T, Ablove R. (2019). A Triceps Split Approach for Total Elbow Arthroplasty. *Techniques in Shoulder and Elbow Surgery*; 20(2):55-57.
- Kluczynski MA, Bisson LJ. (2019). A Review of Early versus Delayed Active Range of Motion after Rotator Cuff Repair. *Minerva Ortopedica e Traumatologica*, 70(2):91-4
- Kluczynski MA, Lashomb W, Kelly W, Bisson LJ. (*In press*). A Systematic Review of the Orthopaedic Literature Involving National Football League Players. *Orthopaedic Journal of Sports Medicine*.
- Lawrence JB, Haider MN, Leddy JJ, Hinds A, Miecznikowski JC, and Willer B. (2019). The King-Devick test in an outpatient concussion clinic: Assessing the diagnostic and prognostic value of a vision test among acutely concussed adolescents. *The Journal of Neuroscience*. 15:398:91-97.
- Leddy J, Haider M, Ellis M, Mannix, R, Darling S, Freitas M, Suffoletto H, Leiter J, Cordingley D, Willer B. (2019). Early subthreshold aerobic exercise for sport-related concussion: A randomized clinical trial. *Journal of American Medical Association Pediatrics*. 4:173(4): 319-325.
- Martin SP, Schauer KS, Czrny J, Ablove R. (*In press*). Electrophysiological Findings in Common Median-Ulnar Nerve Interconnections and their Clinical Implications. *Journal of Hand Surgery*.
- Nodzo SR, Boyle KK, Frisch NB. (*In press*). Nationwide Organism Susceptibility Patterns to Common Preoperative Prophylactic Antibiotics: What Are We Covering? *Journal of Arthroplasty*.
- Schoch B, Aibinder W, Walters J, Sperling J, Throckmorton T, Sanchez-Sotelo J, Duquin T. (2019). Outcomes of Uncemented Versus Cemented Reverse Shoulder Arthroplasty for Proximal Humerus Fractures. *Orthopedics*. 42(2):e236-e241. doi: 10.3928/01477447-20190125-03.
- Touban B, Pavlesen S, Smoak J, Sayegh JBS, Shen X, Zhao J, Anders M. (2019). Association of Sarcopenia with 1 year all-Cause Mortality in Elderly Orthopaedic Trauma Patient. *Journal of Orthopaedic Trauma*, 33(1):e1-e7.



Willer BS, Haider MN, Berherano I, Wilber CG, Mannix R, Kozlowski K, Leddy JJ. (*In press*). Comparison of Rest to Aerobic Exercise and Placebo-Like Treatment of Acute Sport-Related Concussion in Male and Female Adolescents. *Archives of Physical Medicine and Rehabilitation*.

Zasler N, Haider MN, Grzibowski NR, Leddy JJ. (*In press*). Physician Medical Assessment in a Multidisciplinary Concussion Clinic. *Journal of Head Trauma and Rehabilitation*.

Zhou Z, Zhao J, Kluczynski MA. (2019). Interval Estimation for Minimal Clinically Important Difference and its Classification Error via a Bootstrap Scheme. *Statistical Theory and Related Fields*, DOI:10.1080/24754269.2019.1587692.

Zhou Z, Zhao J, Bisson L. (*In press*). Estimation of data adaptive minimal clinically important difference with a nonconvex optimization procedure. *Statistical Methods in Medical Research*.

### **Published Abstracts:**

Hawayek B, Haider MN, Viera KB, Wilber CG, and Leddy JJ. (2019). Cardiovascular Response to Head-Down Tilt in Concussed Adolescents. AMSSM Annual Meeting. April 12-17. Houston, TX. *Clinical Journal of Sports Medicine*. 29 (2):164.

Komm J, Haider MN, Zak S, Wilber CG, Viera KB, and Leddy JJ. (2019). Preliminary study of Dynamic Cerebral Autoregulation during Head Down Tilt using Transcranial Doppler in Acutely Concussed Adolescents. *Clinical Journal of Sports Medicine* 29 (2):157.

Ravi B, Haider MN, Wilber CG, Viera KB, Leddy JJ, and Willer B. (2019). Heart Rate Variability during Face Cooling in Concussed Adolescents - a Pilot Study. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX. *Clinical Journal of Sports Medicine* 29 (2):166.

Wilkins KJ, Haider MN, Wilber CG, Leddy JJ. (2019). Prognostic value of Buffalo Concussion Treadmill Test. AMSSM Annual Meeting. April 12-17. Houston, TX. *Clinical Journal of Sports Medicine* 29 (2):170. nonconvex optimization procedure. *Statistical Methods in Medical Research*.

### **Book Chapters:**

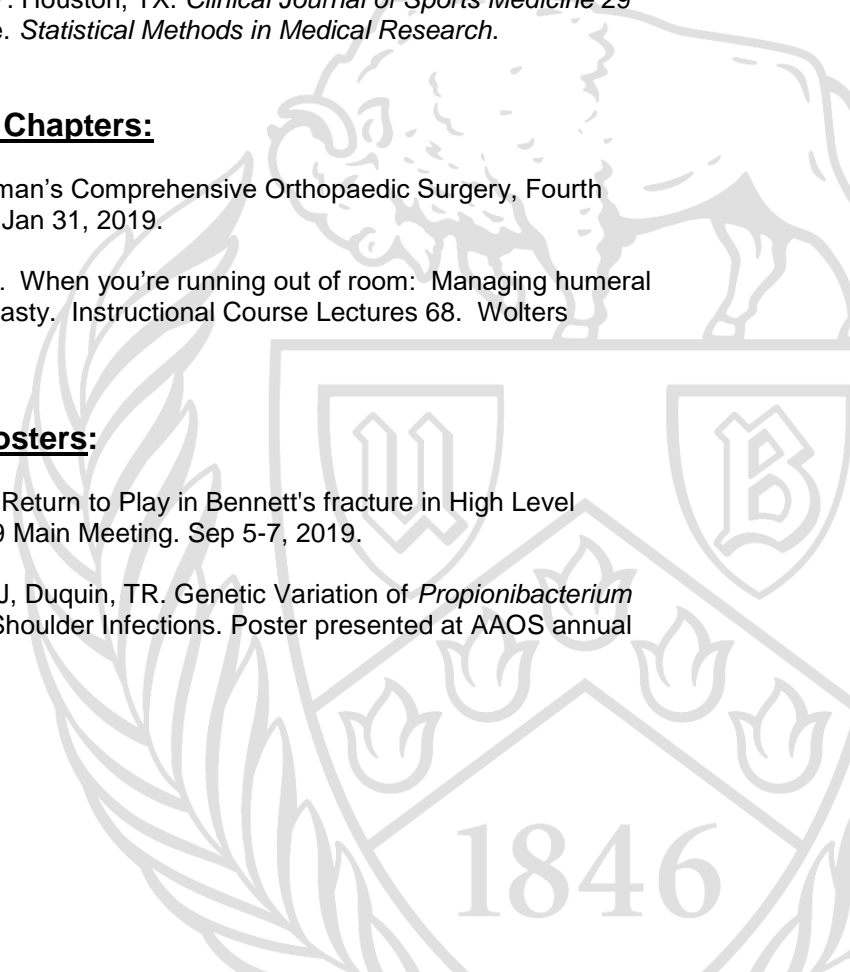
Above RH, Sayegh M. Hand Extensors. In Chapman's Comprehensive Orthopaedic Surgery, Fourth Edition, James M, Chapman MW (4<sup>th</sup> ed): Jan 31, 2019.

Duquin TR, Matthews JR, Dubiel MJ, Sperling JW. When you're running out of room: Managing humeral and glenoid bone loss in shoulder arthroplasty. Instructional Course Lectures 68. Wolters Kluwer. Feb 2019. Ch 7.

### **Posters:**

Above R. Postoperative Immobilization and Early Return to Play in Bennett's fracture in High Level Athletes. Poster Presentation. ASSH 2019 Main Meeting. Sep 5-7, 2019.

Boyle K, Nodzo S, Yergeau D, Marzullo B, Crane J, Duquin, TR. Genetic Variation of *Propionibacterium acnes* and Association with Orthopaedic Shoulder Infections. Poster presented at AAOS annual meeting, Las Vegas, NV. Mar 2019.



Darling S, Freitas, M, Copolo-Ziemer, M; When Somatization Meets Sport: A novel presentation of Functional Neurological Symptom Disorder in a collegiate athlete (When Crazy is Not Crazy), Poster presented at AMSSM Meeting, Houston, TX, Apr 2019

Jancuska J, Radford L, Matthews J, Staub T, Pavlesen S, Ryan L, Rachala S. Can Response to Preoperative Intra-Articular Local Anesthetic Injection Predict Outcomes After Total Knee Arthroplasty? Poster#2230 ORS Annual Meeting, Austin, TX, February 2019.

Matthews JR, Wang J, Zhao J, Kluczynski MA, Bisson L. The Influence of Suture Material on the Biomechanical Behavior of Suture-Meniscal Specimens: A Comparative Study in a Porcine Model. Poster presented at the 2019 Celebration of Scholarship, Graduate Medical Education, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY, June 2019.

Rachala SR, Jackson E, Ryan L, Bayers-Thering M, Kang J, Pavlesen S, Phillips M. Short-Term Outcomes Following Robotic Assisted Total Knee Arthroplasty. Poster #932 Orthopaedic Research Society Annual Meeting Austin, TX, Feb 2019.

### **Paper/Podium Presentations:**

Above R. Cutting Edge Conference Cleveland Clinic. Novel Approach and Design of Total Elbow Arthroplasty. June 2019.

Above R. Spanning Plate Fixation for Distal Radius Fractures, Work/Life Balance and Service (speaker and session moderator). 1<sup>st</sup>Annual Meeting of Erie Canal Hand Society. May 2019.

Boyle KK, Reznik A, Pinzur MR. Surgical Risk Reduction Toolkit, American Academy of Orthopedic Surgeons. Las Vegas, NV. March 2019.

Gillis C, Above R, Bird J. Radiographic Changes in the Acromiohumeral Distance Through the Sagittal Plane. Western Orthopaedic Association (WOA) annual meeting. Jul 31-Aug 3, 2019.

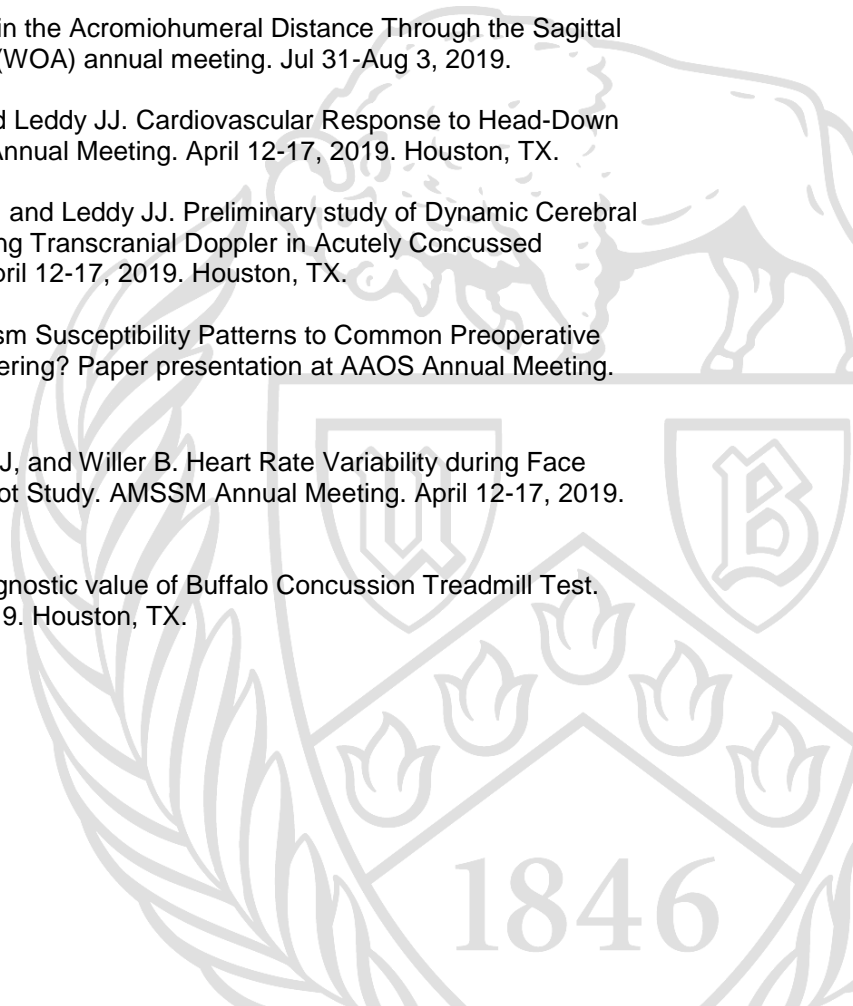
Hawayek B, Haider MN, Viera KB, Wilber CG, and Leddy JJ. Cardiovascular Response to Head-Down Tilt in Concussed Adolescents. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.

Komm J, Haider MN, Zak S, Wilber CG, Viera KB, and Leddy JJ. Preliminary study of Dynamic Cerebral Autoregulation during Head Down Tilt using Transcranial Doppler in Acutely Concussed Adolescents. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.

Nodzo S., Boyle K., Frisch, N. Nationwide Organism Susceptibility Patterns to Common Preoperative Prophylactic Antibiotics: What are we covering? Paper presentation at AAOS Annual Meeting. Las Vegas, NV. Mar 2019.

Ravi B, Haider MN, Wilber CG, Viera KB, Leddy JJ, and Willer B. Heart Rate Variability during Face Cooling in Concussed Adolescents - a Pilot Study. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.

Wilkins KJ, Haider MN, Wilber CG, Leddy JJ. Prognostic value of Buffalo Concussion Treadmill Test. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.



**Invited Talks:**

- Darling S. CPM-1 lecture to UB medical students, Musculoskeletal Exam, Jacobs School of Medicine and Biomedical Sciences. Feb 2019
- Darling, S. UB Family Medicine residency lecture, Injection and Casting lecture and workshop, May 2019
- Duquin, T. Managing Glenoid Bone Loss in Shoulder Arthroplasty. Running Out of Room Instructional Course Lecture. AAOS Annual Meeting. Las Vegas, NV. Mar 2019.
- Duquin T. Complex Shoulder Arthroplasty. Case Based Instructional Course Lecture. Table Moderator. AAOS Annual Meeting. Las Vegas, NV. Mar 2019.
- Ehrensberger MT. Electrochemical Sense and Respond Orthopedic Implants. Bioelectronics for Tissue Regeneration DARPA Proposers Day, Arlington, VA. Feb 2019.
- Hawayek B, Haider MN, Viera KB, Wilber CG, and Leddy JJ. Cardiovascular Response to Head-Down Tilt in Concussed Adolescents. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.
- Kluczynski, M.A., Interpreting Results of Clinical Research: Statistical vs. Clinical Significance, Contemporary Topics in Clinical Research, Orthopaedic Research Society Annual Meeting in Austin, TX, February 2019.
- Komm J, Haider MN, Zak S, Wilber CG, Viera KB, and Leddy JJ. Preliminary study of Dynamic Cerebral Autoregulation during Head Down Tilt using Transcranial Doppler in Acutely Concussed Adolescents. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.
- Leddy JJ. Panel member on "Retirement from Sport after Concussion". AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.
- Leddy JJ. A Physiological Approach to the Diagnosis and Management of Concussion. The Detroit Medical Center. Detroit, MI, January 9, 2019.
- Leddy JJ. The Physical Examination of Concussion and the Differential Diagnosis of Concussion and PPCS. The Detroit Medical Center. Detroit, MI, January 9, 2019.
- Leddy JJ. The Buffalo Concussion Treadmill Test. EATA 2019 Pre-Convention Sport- Related Concussion Summit. Valley Forge, PA. January 11, 2019.
- Leddy JJ. Update on Concussion Diagnosis and Management. Primary Care Update Conference; UBMD. Millennium Hotel, Buffalo, NY. January 24, 2019
- Leddy JJ. Diagnosis and Treatment of Concussion: a Physiological Approach. Weill Cornell Medical Center, New York, NY. February 20, 2019.
- Leddy JJ. Evidence-based Office Based Assessment of Concussion. NYU-Langone Medical Center. NY, NY. February 21, 2019.
- Leddy JJ. An Exercise Prescription for Concussion and Post-Concussion Syndrome Treatment. NYU-Langone Medical Center. NY, NY. February 21, 2019.
- Leddy JJ. The Physiology of Female Concussion. International Brain Injury Association. March 12, 2019, Toronto, CA.

- Leddy JJ. Sex Differences in Concussion Physiology, Symptoms and Response to Treatment. 16th Annual Sport-Related Concussion Conference. Boston Children's Hospital May 9, 2019.
- Marzo, J. Weight bearing cone beam CT scan for analysis of supination external rotation injuries of the ankle. Foot Innovate (International) Webinar. April 2, 2019.
- Merolla G, Sperling J, Sanchez-Sotelo J, Duquin TR, Moroder P, Antuna S, Kirsch J, Walch G, Porcellini G, Paladini P. From the Grammont Prosthesis to the Contemporary Reverse Arthroplasty: Evolution of the Design of Reverse Total Shoulder Arthroplasty. Scientific Exhibit SE43 presented at AAOS annual meeting, Las Vegas, NV. Mar 2019.
- Phillips M. The Story Behind the Development of Computer Navigated Total Knee Replacement and What I've Learned in 7500 cases. The Susquehanna Adult Reconstruction Society annual meeting May 3-4, 2019.
- Ravi B, Haider MN, Wilber CG, Viera KB, Leddy JJ, and Willer B. Heart Rate Variability during Face Cooling in Concussed Adolescents - a Pilot Study. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.
- Wilkins KJ, Haider MN, Wilber CG, Leddy JJ. Prognostic value of Buffalo Concussion Treadmill Test. AMSSM Annual Meeting. April 12-17, 2019. Houston, TX.
- Willer B and Leddy JJ. How to Manage Concussion: Benefits of Research in Clinical Practice. Presentation to the CHEO Research Institute-Ottawa, Canada. May 15, 2019

## Epidemiology Corner



### *What is Bias in Clinical Research?*

Bias is defined as the result of *systematic error* in the design or conduct of a research study. This systematic error results from flaws in study methodology, selection of study participants, data collection, data analysis and interpretation, review, or publication. As a consequence, the observed study results may not be accurate. Most biases are related to study design and procedures, and are classified as *Selection and Information Bias*.

#### \*References:

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Thank you everyone for such a great year! HAPPY SUMMER!

- Research Team