

EXTREMITY WAR INJURIES XV

January 20-22, 2020 • Washington, DC



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Message from the Program Oversight Co-Chairs



Dear Colleagues:

We would like to welcome you to the Society of Military Orthopaedic Surgeons (SOMOS) / Orthopaedic Trauma Association (OTA) / American Orthopaedic Society for Sports Medicine (AOSSM) / American Society for Surgery of the Hand (ASSH) 2020 Research Symposium, Extremity War Injuries XV (EWI XV).



For the fifteenth annual EWI event, the program is divided into seven general sessions: Each session will have 4-5 didactic presentations, followed by questions and answers. There will be small group discussion breakout sessions at the end of each day. There will also be concurrent tracks on Trauma and Hand (Tuesday) and Trauma and Readiness (Wednesday).

The SOMOS, OTA, AOSSM and ASSH have all given their support to EWI XV to promote its dual aims of strengthening existing collaborations with the military and to also promote the most important new advances. We anticipate continuing on the strong tradition of previous EWI conferences that have been so important in improving the care of extremity trauma and influencing future research work.

We look forward to another EWI meeting that will lead to new collaborations, improve the care of military and civilian patients, and help drive the future work aimed at improving the care of our patients and of all participants. Thank you for your involvement.

Respectfully,

LTC Jonathan F. Dickens, MD
Andrew Schmidt, MD
EWI Symposium Oversight Co-Chairs

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Invited Guest Speakers



Congressman Brad Wenstrup, DPM

Brad Wenstrup was elected in 2012 to represent the people of Ohio's Second Congressional District in the United States House of Representatives. He brings experience as a doctor, Army Reserve officer, Iraq War veteran, and small business owner to help Congress tackle the economic and security challenges facing the nation.

In the 116th Congress, Brad serves on the House Committee on Ways and Means and the House Permanent Select Committee on Intelligence. He previously spent six years on the Armed Services Committee and the Committee on Veterans' Affairs. As a member on the Ways and Means and Intelligence Committees, Brad is working to address the national health and systemic poverty issues, while strengthening our national security. He has long been a voice of support for southern Ohio's veteran community.

Brad has served in the U.S. Army Reserve since 1998, currently holding the rank of colonel. In 2005-06, he served a tour in Iraq as a combat surgeon, and was awarded a Bronze Star and Combat Action Badge for his service. In 2018, Colonel Wenstrup was awarded the Soldier's Medal for heroism.

During his time in Congress, Brad is fulfilling his Reserve duties by serving as the Medical Policy Advisor for the Chief of the Army Reserve as well as seeing patients at Walter Reed National Military Medical Center in Bethesda.



Terry M. Rauch, PhD

Dr. Terry M. Rauch is currently the acting Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O). In addition, he serves as the HRP&O Director of Medical Research and Development (R&D) for deployment medicine and force health protection.

Dr. Rauch also represents the DoD R&D community in international health agreements and domestic federal and non-government partnerships in an effort to better serve missions, and enhance medical readiness for 2.3 million servicemembers through cross-collaborations.

Dr. Rauch has more than 35 years of experience in many facets of the Military Health System and has held numerous senior-level positions in the Army and the Office of the Secretary of Defense. After retiring from the U.S. Army in October 2005 at the rank of Colonel, he joined the Science Applications International Corporation (SAIC) as a Senior Principal Life Scientist. At SAIC, he focused on comprehensive strategic planning and analysis for the Office of the Secretary of Defense on matters relating to defense biomedical research, development and acquisition investment strategies and their supporting infrastructure.

Dr. Rauch received a Bachelor of Science degree in psychology from the University of Cincinnati, where he also earned his PhD in biology and psychology.

Extremity War Injuries XV

EWI Oversight Chairs: Andrew H. Schmidt, MD and LTC Jonathan F. Dickens, MD

Symposium Co-Chairs: Trauma: LTC Daniel Stinner, MD and Joseph Hsu, MD

Readiness & Sports Medicine: Maj Andrew J. Sheean, MD and CAPT Matthew T. Provencher, MD

Hand and Upper Extremity Trauma: CDR Scott M. Tintle, MD and Jaimie Shores, MD

Scientific Director: CDR Scott M. Tintle, MD

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Academy of Orthopaedic Surgeons and the Society of Military Orthopaedic Surgeons. The American Academy of Orthopaedic Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

The American Academy of Orthopaedic Surgeons designates this live activity for a maximum of 17 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Extremity War Injuries XV

Grand Ballroom A unless otherwise indicated

January 20, 2020

9:00 am - 5:00 pm

STaR Meeting

3:00 pm - 5:30 pm

EWI Symposium Check In (Grand Foyer)

January 21, 2020

6:30 am

EWI Symposium Check In (Grand Foyer)

9:40 am - 10:00 am

INVITED GUEST SPEAKER

6:30 am - 7:00 am

Coffee (Grand Foyer)

Scientific Collaboration is the Source of Strength We Need for the Future of our National Security

7:00 am - 7:05 am

Symposium Welcome

Andrew H. Schmidt, MD
University of Minnesota

Terry M. Rauch, PhD
Acting Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight

7:05 am - 7:15 am

Past, Present and Future of EWI

James R. Ficke, MD
Johns Hopkins University

10:00 am - 10:20 am

MHS and DHA Leadership Q&A

Moderators: James R. Ficke, MD & Paul F. Pasquina, MD

7:15 am - 7:25 am

Current Funding Status: How It Works and How to Succeed

Andrew N. Pollak, MD
University of Maryland

General Session I: Unsolved Topics in Orthopaedic Trauma

Moderators: COL B. Kyle Potter, MD & Michael J. Bosse, MD

7:25 am - 7:35 am

Discussion

7:35 am - 8:05 am

Breakfast/Industry Update

*CME Not Available

Zimmer Biomet

Fast Frame: Rationale and Design

Robert V. O'Toole, MD

10:20 am - 10:30 am

A National Trauma Research Action Plan (NTRAP) and Implications for the Military

James R. Ficke, MD
Johns Hopkins University

10:30 am - 10:40 am

Readiness on the Home Front: How are Recent Events Impacting the Systems of Care and Medical Education?

David C. Teague, MD
University of Oklahoma

8:05 am - 8:15 am

Gaps and Priorities in Clinical and Rehabilitative Medicine

MAJ Barbara K. Bujak, PT, DPT, PhD
US Army Medical Research and Development Command

10:40 am - 10:50 am

Topical Antibiotics to Prevent Infection

Robert V. O'Toole, MD
University of Maryland

8:15 am - 8:25 am

Gaps and Priorities in Combat Casualty Care

LTC David S. Johnston, MD
US Army Medical Research and Development Command

10:50 am - 11:00 am

Pain Management for the Future Fight

Joseph R. Hsu, MD
Carolinas Medical Center

8:25 am - 8:35 am

Gaps and Priorities in Military Operational Medicine

CDR Christopher T. Steele, MD
US Army Medical Research and Materiel Command

11:00 am - 11:15 am

Discussion

8:35 am - 8:50 am

Priorities of the PRORP and PRMRP

Patricia C. Modrow, PhD & Akua Roach, PhD
US Army Medical Research and Development Command

11:15 am - 11:35 am

BREAK (Grand Foyer)

8:50 am - 9:00 am

Discussion

9:00 am - 9:20 am

BREAK (Grand Foyer)

General Session II

Moderators: Col Christopher T. Lebrun, MD & Maj Gerard Slobogean, MD, MPH

9:20 am - 9:40 am

INVITED GUEST SPEAKER
Moving Towards A Ready Medical Force

Congressman Brad Wenstrup, DPM
US House of Representatives, Ohio 2nd District

11:45 am - 11:55 am

Lower Extremity Amputation: Surgical Options Based on Current Evidence

COL B. Kyle Potter, MD
Walter Reed National Military Medical Center

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Grand Ballroom A unless otherwise indicated

Presenters and times are subject to change.

January 21, 2020

11:55 am – 12:05 pm	Osteointegration: Current Outcomes and Complications CAPT Jonathan A. Forsberg, MD, PhD Walter Reed National Military Medical Center	1:35 pm – 1:45 pm	Functional Outcomes in Upper Extremity Transplantation Jaimie T. Shores, MD Johns Hopkins Medical Center
12:05 pm – 12:20 pm	Discussion	1:45 pm – 1:55 pm	Advances in Peripheral Nerve Repair Sami Tuffaha, MD Johns Hopkins Medical Center
12:20 pm – 1:05 pm	Lunch (Grand Ballroom B)	1:55 pm – 2:05 pm	Advances in Prosthetic and Rehabilitation Paul F. Pasquina, MD Walter Reed National Military Medical Center
1:05 pm – 1:15 pm	Transition	2:05 pm – 2:20 pm	Discussion
General Session III: Upper Extremity Reconstruction Moderators: L. Scott Levin, MD & CDR Scott M. Tintle, MD		2:20 pm – 2:25 pm	TRANSITION
1:15 pm – 1:25 pm	Targeted Muscle Reinnervation for Amputees LCDR Jason M. Souza, MD Walter Reed National Military Medical Center		
1:25 pm – 1:35 pm	Psychosocial Outcomes in Upper Extremity Transplant L. Scott Levin, MD University of Pennsylvania		

Track A: Trauma Grand Ballroom A

Moderators: William T. Obremsky, MD & LTC Daniel J. Stinner, MD

2:25 pm – 2:35 pm	Physician Wellness for the Military Surgeon Hassan R. Mir, MD, MBA Florida Orthopaedic Institute
2:35 pm – 2:45 pm	REBOA: Does it Change How We Manage Junctional Hemorrhage? Col Todd E. Rasmussen, MD Uniformed Services University
2:45 pm – 2:55 pm	Pelvic Fracture and Associated Hemorrhage: Optimal Treatment Pathways in 2020 Joshua L. Gary, MD McGovern Medical School at UT Health Houston
2:55 pm – 3:05 pm	Discussion
RESEARCH HIGHLIGHTS	
3:05 pm – 3:10 pm	Characterization of Civilian Blast Injury Patients in US Trauma Centers LT Carl A. Nunziato, MD Dell Seton Medical Center

Track B: Hand Grand Ballroom C

Moderators: Jamie T. Shores, MD

2:25 pm – 2:35 pm	Multi-Modal Pain Management Options for Amputees and Mangled Extremities James P. Higgins, MD Curtis National Hand Center
2:35 pm – 2:45 pm	Measuring Functional Outcomes Across Modalities for Restoration of UE Loss CDR Scott M. Tintle, MD Walter Reed National Military Medical Center
2:45 pm – 2:55 pm	Options for Alloplastic/Engineered Nerve Interfaces COL Leon Nesti, MD Walter Reed National Military Medical Center
2:55 pm – 3:05 pm	Discussion
RESEARCH HIGHLIGHTS	
3:05 pm – 3:10 pm	Erythropoietin Improves Functional Recovery in War Injury Relevant Severe Nerve Crush Injury John Elfar, MD, FACS Penn State CORTS

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January 21, 2020

3:10 pm – 3:15 pm

Combat-Related Orthopaedic Surgical Case Volume in the Military Health System

Col Patrick M. Osborn, MD
Brooke Army Medical Center

3:15 pm – 3:20 pm

Efficacy of Current Antibiotics Strategies Employed at Closure of Open Fractures

Michael J. Bosse, MD
Carolinas Medical Center, Atrium Healthcare System

3:20 pm – 3:30 pm

Discussion

3:10 pm – 3:15 pm

Multidisciplinary Approach to Major Upper Extremity Limb Salvage / Replantation

Capt Sarah N. Pierrie, MD
San Antonio Military Medical Center

3:15 pm – 3:20 pm

Long-Term Outcomes of Combat-Related Extremity Injuries Treated with Flap-Based Limb Salvage

LCDR Sean M. Wade, MD
Walter Reed National Military Medical Center

3:20 pm – 3:30 pm

Discussion

3:30 pm – 3:50 pm

BREAK (Grand Foyer)

BREAKOUT SESSIONS

3:50 pm – 4:50 pm

Breakout Group 1: Infection in Trauma Portrait Room

Moderators: Robert V. O'Toole, MD,
Jarrod E. Dumpe, MD & Joshua L. Gary,
MD

Breakout Group 2: Upper Extremity Amputation Freer Room

Moderators: CDR Scott M. Tintle, MD and
Jaimie T. Shores, MD

Breakout Group 3: Strategies to Prevent and Treat PTOA Sackler Room

Moderators: Kenneth L. Cameron, PhD,

4:50 pm – 5:10 pm

5:10 pm – 5:25 pm

5:30 pm – 7:00 pm

MPH, ATC, Maj Andrew J. Sheean, MD &
LTC Daniel J. Stinner, MD

Breakout Group 4: Military and Civilian Collaboration to Advance the Warfighter Hirshorn Room

Moderators: COL B. Kyle Potter, MD,
CAPT George P. Nanos, MD, & Col Joseph
J. Stuart, MD

Breakout Group Reports

Questions and Answers

Reception/Scientific Poster Session
(Grand Ballroom B)

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Grand Ballroom A unless otherwise indicated

Presenters and times are subject to change.

January 22, 2020

6:30 am

EWI Symposium Check In
(Grand Foyer)

6:30 am – 7:00 am

Coffee (Grand Foyer)

7:00 am – 7:05 am

Welcome / Review of Day Two

General Session IV: Regenerative Medicine Implications in the Military

Moderators: Leon J. Nesti, MD, PhD & Johnny Huard, PhD

7:05 am – 7:25 am

Orthobiologics in My Clinical Practice

James P. Bradley, MD
President, AOSSM
University of Pittsburgh

Extremity War Injuries XV

Grand Ballroom A unless otherwise indicated

Presenters and times are subject to change.

January 22, 2020

7:25 am – 7:35 am	Discussion	10:20 am – 10:30 am	Adipose Derived Stem Cells Claude T. Moorman III, MD Carolinas Medical Center
7:35 am – 7:55 am	What Lies Ahead in Biomedical Engineering Jeffrey M. Karp, PhD Clearwater, FL	10:30 am – 10:40 am	Joint Preservation Strategies for PTOA Seth L. Sherman, MD Stanford University
7:55 am – 8:10 am	Discussion	10:40 am – 10:55 am	Discussion
8:10 am – 8:40 am	Breakfast/Industry Update *CME Credit Not Available Johnson & Johnson Medical Devices Companies My Turn? Colonel (Ret) Matt Putnam, MD	10:55 am – 11:15 am	BREAK (Grand Foyer)
General Session V: The Future of the Military Health System: Advancing the Integrated System of Readiness and Health Moderators: RADM (Ret) Bruce Doll, CAPT George P. Nanos, MD & COL Jennifer Meno		General Session VII: Hitting the Target—Ensuring Optimal Human Performance Health & Readiness Throughout Military Service Moderators: CDR Christopher T. Steele & James J. Irrgang, PhD, PT, ATC	
8:40 am – 9:00 am	Bringing the MHS Into the Future Through Advanced Analytics COL Jennifer Meno Deputy Director at Defense Health Agency	11:15 am – 11:25 am	Musculoskeletal Injury Rates Across the Military: Who and What is at Risk Kenneth L. Cameron, PhD, MPH, ATC United States Military Academy
9:00 am – 9:20 am	Warfighter Readiness: Current Obstacles and Priorities RADM Bruce L. Gillingham, MD The Surgeon General of the US Navy	11:25 am – 11:35 am	Blood Flow Restriction: State of the Art in 2020 Johnny Owens, PT Owens Recovery Science
9:20 am – 9:40 am	MHS And DHA Leadership Q&A Moderators: RADM (Ret) Bruce Doll & CAPT George P. Nanos, MD	11:35 am – 11:45 am	Next Generation Biomotion Testing to Optimize Return to Duty for Our Warrior Athletes Scott Tashman, PhD The University of Texas Health Science Center at Houston, Steadman Phillipon Research Institute
9:40 am – 10:00 am	BREAK (Grand Foyer)	11:45 am – 12:00 pm	Discussion
General Session VI: Post Traumatic and Post-Surgical Sequelae from the Battlefield to the PT Formation Moderators: James P. Bradley, MD & CAPT Matthew T. Provencher, MD		12:00 pm – 12:30 pm	Lunch/Industry Update *CME Credit Not Available Arthrex NanoScope™: “The Future of Arthroscopy” CAPT Matthew T. Provencher, MD Knotless Tensionable Solutions for Shoulder Instability CAPT Matthew T. Provencher, MD The Evolution of All-Inside Meniscus Repair Seth L. Sherman, MD
10:00 am – 10:10 am	Update from the Bench Top: Current Capabilities and Future Directions in Orthobiologics for the Military Johnny Huard, PhD The University of Texas Health Science Center at Houston / Steadman Phillipon Research Institute	12:30 pm – 12:55 pm	TRANSITION
10:10 am – 10:20 am	Autologous Conditioned Serum for the Treatment of Post-Traumatic Osteoarthritis Gustavo Zanotto, PhD Colorado State University		

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Grand Ballroom A unless otherwise indicated

Presenters and times are subject to change.

January 22, 2020

Track A: Trauma Grand Ballroom A

Moderators: David Teague, MD & Col Christopher T. Lebrun, MD

12:55 pm – 1:05 pm **Where are We in 2020 on Making the Clinical Diagnosis of Compartment Syndrome?**

Anna Miller, MD
Washington University in St. Louis

1:05 pm – 1:15 pm **What's on the Horizon to Aid in Diagnosis and/or Treatment of Compartment Syndrome?**

Col Patrick M. Osborn, MD
San Antonio Military Medical Center

1:15 pm – 1:25 pm **It Didn't Heal. Now What? An Approach for the Treatment of Nonunions**

Joseph R. Hsu, MD
Carolinas Medical Center

1:25 pm – 1:35 pm **Ready Medical Force: What's Relevant from the Front Line**

LTC Daniel J. Stinner, MD
Vanderbilt University

1:35 – 1:45 pm **Pushing the Rehabilitation Envelope: Translation into Civilian Practice?**

Danielle Melton, MD
McGovern Medical School at UT Health Houston

1:45 pm – 1:55 pm **Discussion**

RESEARCH HIGHLIGHTS

1:55 pm – 2:00 pm **Institutional Trends in Limb Restoration Efforts Following Blast-Related Trauma**

CPT Colin Harrington, MD
Walter Reed National Military Medical Center
*Presented by LT Jordan Tropf, MD

2:00 pm – 2:05 pm **Femoral Neck CT Correlation with Mineral Density After Extremity Amputation**

Benjamin W. Hoyt, MD
Walter Reed National Military Medical Center

2:05 pm – 2:10 pm **Reliability of the Walter Reed Classification for Heterotopic Ossification Severity**

Benjamin W. Hoyt, MD
Walter Reed National Military Medical Center

2:10 pm – 2:20 pm **Discussion**

Track B: Readiness and Return to Duty Grand Ballroom C

Moderators: CAPT Matthew T. Provencher, MD & CDR Lance E. LeClere, MD

12:55 pm – 1:05 pm **Clinical Outcomes and Big Data: Implications for the DoD**

James J. Irrgang, PhD, PT, ATC
University of Pittsburgh

1:05 pm – 1:15 pm **Predicting RTD: How MOTION Changes the Paradigm of Care**

MAJ Daniel I. Rhon, PT, DPT, DSC
Baylor University

1:15 pm – 1:25 pm **Critical Issues in the Foot/Ankle for the Tactical Athlete**

Annunziato Amendola, MD
Duke University

1:25 pm – 1:35 pm **Improving Return to Sport (Duty) After ACL Reconstruction**

Kurt Spindler, MD
The Cleveland Clinic

1:35 pm – 1:45 pm **Shoulder Instability in the Military: What We Know and Don't Know**

CAPT Matthew T. Provencher, MD
The Steadman Phillipon Clinic

1:45 pm – 1:55 pm **Discussion**

RESEARCH HIGHLIGHTS

1:55 pm – 2:00 pm **Establishing the Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR)**

Nelson Hager, MD, MS
The Geneva Foundation / Musculoskeletal Injury Rehabilitation Research for Operational

2:00 pm – 2:05 pm **Psychological Impact of Reoperation in the Year After Primary ACL Reconstruction**

Cale Jacobs, PhD
University of Kentucky

2:05 pm – 2:10 pm **Optimization Of Return-to-Duty Protocols After Anterior Cruciate Ligament Injury**

Scott Tashman, PhD
Steadman Philippon Research Institute

2:10 pm – 2:20 pm **Discussion**

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Grand Ballroom A unless otherwise indicated

Presenters and times are subject to change.

January 22, 2020

2:20 pm – 2:25 pm

TRANSITION

BREAKOUT SESSIONS

2:25 pm – 3:25 pm

Breakout Group 5: Compartment Syndrome
Portrait Room

Moderators: Andrew H. Schmidt, MD & Col Patrick M. Osborne, MD

Breakout Group 6: Functional Return to Duty Decision Making and Optimization Post Injury
Freer Room

Moderators: CDR Christopher T. Steele, MD, Jason Jadgchew & Col Mark A. Slabaugh, MD

3:25 pm – 3:40 pm

3:40 pm – 3:45 pm

Breakout Group 7: Orthobiologics for Traumatic and Overuse Injuries
Sackler Room

Moderators: Nelson Hager, MD & Seth L. Sherman, MD

Breakout Group 8: Clinical Outcomes and Big Data
Hirshorn Room

Moderators: MAJ Daniel I. Rhon, PT, DPT, DSc, Maj Andrew J. Sheean, MD, & James J. Irrgang, PhD, PT, ATC

Small Group Summary

TRANSITION

Track A: Trauma Grand Ballroom A

Moderator: LTC Daniel J. Stinner, MD

3:45 pm – 3:55 pm

What's New in Infection Prevention
William T. Obremsky, MD
Vanderbilt Orthopaedics

3:55 pm – 4:05 pm

What Tricks Do We Have Up Our Sleeves for Osteomyelitis?
Jarrod E. Dumpe, MD
Medical Center Navicent Health

4:05 pm – 4:15 pm

Soft Tissue Coverage of the Lower Extremity: Do We Need to Rely on Others for Coverage?
John D. Adams, MD
University of South Carolina School of Medicine

4:15 pm – 4:25 pm

What to Do When Coverage is Delayed? An Evidence-Based Update and What's on the Horizon
Joseph C. Wenke, PhD
US Army Institute of Surgical Research

4:25 pm – 4:35 pm

Junctional Injuries: Where are We in 2020?
CAPT(Ret) Dana C. Covey, MD
UC San Diego

4:35 pm – 4:45 pm

Discussion

Track B: Readiness and Return to Duty Grand Ballroom C

Moderators: Kurt Spindler, MD & Maj Andrew J. Sheean, MD

3:45 pm – 3:55 pm

How Can We Improve Outcomes with Biologics and other Novel Delivery Devices
Chelsea S. Bahney, PhD
Steadman Phillipon Research Institute

3:55 pm – 4:05 pm

Optimizing Outcomes with Low Back Pain
Brett A. Freedman, MD
Mayo Clinic

4:05 pm – 4:15 pm

Discussion

4:15 pm – 4:25 pm

Lessons Learned from Instituting a Human Performance Program at SOCOM
Jason Jadgchew
Naval Special Warfare Command

4:25 pm – 4:35 pm

Multi-Ligamentous Knee Injuries in the Military
Brian R. Waterman, MD
Wake Forest University

4:35 pm – 4:45 pm

Discussion

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RESEARCH HIGHLIGHTS

- 4:45 pm – 4:50 pm **Readiness Relevance of SOMOS Annual Meeting Topics: A 10-Year Review**
COL Kenneth J. Nelson, MD
Womack Army Medical Center
- 4:50 pm – 4:55 pm **Custom Energy-Storing Orthosis Effects on Extremity Function and Preservation**
Benjamin W. Hoyt, MD
Walter Reed National Military Medical Center
- 4:55 pm – 5:00 pm **Multicenter Retrospective Review of Emergent Pelvic Injury Management: Improvement Needed?**
Joshua L. Gary, MD
McGovern Medical School at UT Health Houston
- 5:00 pm – 5:10 pm **Discussion**

RESEARCH HIGHLIGHTS

- 4:45 pm – 4:50 pm **Loading Characteristics of Service Members with Transtibial Amputations during a Drop-Landing**
Timothy C. Mauntel, PhD, ATC
Walter Reed National Military Medical Center
- 4:50 pm – 4:55 pm **Exercise Improves Exosome Production and Regenerative Capacity in Myogenic Precursors**
Chelsea S. Bahney, PhD
Steadman Philippon Research Institute
- 4:55 pm – 5:00 pm **Enhancing the Damage Control Skills of Far Forward Providers using Augmented Reality**
COL Kenneth J. Nelson, MD
Womack Army Medical Center
- 5:00 pm – 5:10 pm **Discussion**

5:10 pm – 5:15 pm TRANSITION

5:15 pm – 5:30 pm Closing Remarks



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Extremity War Injuries XV

Poster Presentations

Grand Ballroom B

READINESS

Poster 1: Data and Analytics Infrastructure to Advance Musculoskeletal Injury Rehabilitation Research
John B. Heller, BS, PMP, The Geneva Foundation / Uniformed Services University of the Health Sciences

Poster 2: Fighting the Next War: The Future of Downrange Orthopaedics
COL Kenneth J. Nelson, MD, Womack Army Medical Center

TRAUMA

Poster 3: Regenerative Collagenous Microfiber Implants Promote Tendon Healing: Product Development Studies
Michael Francis, PhD, Embody Inc.

Poster 4: ON Path: Outpatient Nonunion Pathway: Surgical Tactic and Pathway
Abhishek Ganta, MD, Atrium Health Musculoskeletal Institute
*Presented by Joseph R. Hsu, MD

Poster 5: Validation of a Human Model of Compartment Syndrome
Edward Harvey, H.BSc, MDCM, MSc, FRCSC, MY01, Inc.

Poster 6: Comparison of Devices for ACS under Real World Conditions
Edward Harvey, H.BSc, MDCM, MSc, FRCSC, MY01, Inc.

Poster 7: Prosthetic Feet Prescribed to Service Members with Unilateral Transtibial Amputation
Melissa Hewitt, BS, Henry M. Jackson Foundation for the Advancement of Military Medicine

Poster 8: Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury
Joseph R. Hsu, MD, Atrium Health Musculoskeletal Institute

Poster 9: Monitoring Simulated Fracture Healing via Non-Invasive Electromagnetic Coupling Measurement
Kevin Labus, PhD, Colorado State University
*Presented by Kirk C. McGilvray, PhD

Poster 10: Does Sequence of Open and Closed Fracture Treatment During Same Session Impact Infection?
Louis Lewandowski, MD, Atrium Health Musculoskeletal Institute

Poster 11: The Utility of Routine Cultures in Low Risk Nonunion Surgeries
Louis Lewandowski, MD, Atrium Health Musculoskeletal Institute

Poster 12: Traumatic Arthrotomies: Do They All Need the Operating Room?
Richard R. McKnight Jr., MD, Atrium Health Musculoskeletal Institute
*Presented by Joseph R. Hsu, MD

Poster 13: Potential of Synovial Mesenchymal Stem Cells Isolated from Hip Joints
Yoichi Murata, MD, PhD, Steadman Philippon Research Institute

Poster 14: Additive Manufacturing and Dynamic Mechanical Culturing of Fibrocartilaginous Tissue Scaffolds
Mitchell Page, BE(Hons), Colorado State University
*Presented by Kirk C. McGilvray, PhD

Poster 15: tBMP-2 Induces Complete Union in Chronic Caprine Tibial Defect Model
David H. Stewart, PhD, The Geneva Foundation

Poster 16: Fracture Healing Diagnosis and Prediction by Direct Electromagnetic Coupling Antennae
Jakob G. Wolynski, BS, Colorado State University
*Presented by Kirk C. McGilvray, PhD