BASIC SCIENCE FOCUS FORUM

COURSE AGENDA

Edward J. Harvey, MD,
Basic Science Committee Chair

Wednesday-Thursday,
September 25-26, 2019

11.0 AMA PRA Category 1 Credits™
OVERVIEW

The 2019 Basic Science Focus Forum Course (BSFF) is geared towards orthopaedic surgeons whose passion is basic science and how it relates or may affect their practice. Basic science researchers will also obtain valuable knowledge about translational opportunities and how their research may change orthopaedic care. This course will involve 6 main symposia and 27 papers that are targeted at basic science studies and their outcomes.

The attendees of the BSFF program will have the chance to combine with the attendees of the International Trauma Care Forum for an exchange of ideas during their joint session symposium. This combined session has proved to be a great collaboration and a chance to discuss ideas with our international colleagues.

TARGET AUDIENCE

Academic orthopaedic surgeons, community surgeons with an interest in clinically relevant basic science, basic and clinical researchers, residents and fellows will benefit most from this Basic Science Focus Forum.

LEARNING OBJECTIVES

Upon successful completion of this course, participants will be able to:

✓ Outline internal fixation principles to guide treatment
✓ Explore new concepts in polytrauma with attention to haemorrhage and wound care
✓ Discover the basic science and clinical applications of induced membrane surgery
✓ Understand the major techniques in delivering antibiotics in surgery
✓ Comprehend the basic science and clinical applications of bone grafting
✓ Understand what new regulatory rules will mean to you for research and innovation

BASIC SCIENCE COMMITTEE

Edward J. Harvey, MD Chair
Michael T. Archdeacon, MD
Andrew R. Evans, MD, FACS
Justin Haller, MD
Christopher Lee, MD
Aaron Nauth, MD
Emil H. Schemitsch, MD

FEATURED SYMPOSIA

• Biomechanical Models: Key Considerations in Study Design!
• The Polytrauma Patient: Current Concepts and Evolving Care
• The Induced Membrane (Masquelet) Technique for Bone Defects: Basic Science, Clinical Evidence and Technical Issues
• Local Delivery of Antibiotics for Bone Infections: Current Insights – Combined Session with International Trauma Care Forum
• Bone Healing: Advances in Biology and Technology
• Regulation of Orthopaedic Devices: Future Implications for Research and Innovation
## BASIC SCIENCE FOCUS FORUM

**SEPTMBER 25 - 26, 2019 - DENVER, COLORADO - #OTA2019**

### COURSE AGENDA

**Wednesday, 9.25.19**

#### WEDNESDAY, September 25, 2019

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<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
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<tr>
<td>7:30 AM</td>
<td>Introduction</td>
<td>Edward J. Harvey, MD</td>
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<td></td>
<td><em>(Room 605-607)</em></td>
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<tr>
<td>7:35 AM</td>
<td><strong>SYMPOSIUM I</strong></td>
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<tr>
<td>8:35 AM</td>
<td>Biomechanical Models: Key Considerations in Study Design!</td>
<td><em>Emil H. Schemitsch, MD</em>&lt;br&gt;<em>Peter Augat, PhD</em></td>
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<tr>
<td>7:35 AM</td>
<td><strong>SYMPOSIUM I</strong></td>
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<tr>
<td>7:35 AM</td>
<td>What are the Most Important Characteristics of a Good Biomechanical Study?</td>
<td><em>Peter Augat, PhD</em></td>
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<td>7:44 AM</td>
<td>VE versus Composite Bone versus Cadaver Bone: How Do I Choose?</td>
<td><em>Michael Hast, PhD</em></td>
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<td>7:53 AM</td>
<td>How Do I Select an Experimental Test and FE Analysis Protocol?</td>
<td><em>Cari Whyne, PhD</em></td>
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<td>8:02 AM</td>
<td>Use of Biomechanics Research for Implant Design: What are the Pros and Cons?</td>
<td><em>Michael Bottlang, PhD</em></td>
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<td>8:11 AM</td>
<td>How I Use the Results of Biomechanical Research in Clinical Practice!</td>
<td><em>Emil H. Schemitsch, MD</em></td>
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<td>8:20 AM</td>
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<td><em>Peter Augat, PhD</em></td>
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<td>8:35 AM</td>
<td><strong>PAPER SESSION I</strong></td>
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<tr>
<td>9:10 AM</td>
<td>Biomechanics - Hot Topics</td>
<td><em>Emil H. Schemitsch, MD</em>&lt;br&gt;<em>Peter Augat, PhD</em></td>
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<td>8:35 AM</td>
<td><strong>PAPER SESSION I</strong></td>
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<td>8:41 AM</td>
<td>PAPER 2 Supplement Fixation of Supracondylar Distal Femur Fractures: A Biomechanical Comparison of Dual-Plate and Plate-Nail Fixation Techniques</td>
<td><em>David Wright, MD</em>&lt;br&gt;<em>Donald Desanto, MD</em>&lt;br&gt;<em>Michelle H. McGarry, MD</em>&lt;br&gt;<em>Thay Q. Lee, PhD</em>&lt;br&gt;<em>John A. Scolaro, MD</em></td>
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<td>8:47 AM</td>
<td>PAPER 3 Dramatically Improved Strength of Proximal Humeral Fixation with a Tuberosity-Specific Fixation Plate</td>
<td><em>Robert Walker, MD</em>&lt;br&gt;<em>Paulo Castaneda, BS</em>&lt;br&gt;<em>Jill Anne Goodwin, MD</em>&lt;br&gt;<em>Michael D. McKee, MD, FRCSC</em></td>
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<td>8:53 AM</td>
<td>PAPER 4 Biomechanical Evaluation of 3 Fixation Methods for Unstable Femoral Neck Fractures</td>
<td><em>Emily Bliven</em>&lt;br&gt;<em>Simon Hackl, MD</em>&lt;br&gt;<em>Sabrina Sandriesser</em>&lt;br&gt;<em>Peter Augat, PhD</em></td>
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<tr>
<td>8:59 AM</td>
<td>Discussion</td>
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<td>9:10 AM</td>
<td>Break</td>
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**9:25 AM - 10:25 AM**  
**SYMPOSIUM II**  
**The Polytrauma Patient: Current Concepts and Evolving Care**  
*Christopher Lee, MD*<br>*Justin Haller, MD*  

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<tr>
<td>9:25 AM</td>
<td><strong>SYMPOSIUM II</strong></td>
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<tr>
<td>9:25 AM</td>
<td>Overview</td>
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<td>9:30 AM</td>
<td>Hemorrhage Control</td>
<td><em>Todd E. Rasmussen, MD</em></td>
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<td>9:40 AM</td>
<td>Timing of Surgery</td>
<td><em>Hans-Christoph Pape, MD</em></td>
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<td>9:50 AM</td>
<td>Spectrum of Coagulopathy in Trauma: Acute Trauma-induced Coagulopathy versus Venous Thromboembolism</td>
<td><em>Joshua L. Gary, MD</em></td>
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<td>10:00 AM</td>
<td>Negative Pressure Wound Therapy in Polytrauma Patients</td>
<td><em>James P. Stannard, MD</em></td>
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**#OTA2019**  
**Orthopaedic Trauma Association**  
**Register Today at ota.org**
10:25 AM – PAPER SESSION II
11:15 AM General Trauma Topics
Moderators: Christopher Lee, MD
           Justin Haller, MD

10:25 AM PAPER 5
Intra-Articular Relaxin-2 as a Treatment for Arthrofibrosis
Edward Rodriguez, MD;
Stephen Okajima; Philip Hanna, MD;
Aron Lechtig, MD; William Blessing;
Maria Belen Cubria; Angie N. Sabogal, MD;
Juan V. Camacho, MD; Mark Grinstaff, PhD;
Ara Nazarian

10:31 AM PAPER 6
Vaporized Versus Combusted Nicotine: A Biomechanical Comparison of Achilles Tendon Healing in a Rat Model
Matthew R. Garner, MD;
Patrick M. Kennedy, DPT, MD;
Kaitlin L. Saloky, BS; Aditya Yadavalli, BS;
Erin M. Barlow, BA; Michael C. Aynardi, MD;
Jesse E. Bible, MD, MHS;
Gregory S. Lewis, PhD; Aman Dhawan, MD

10:37 AM Discussion

10:47 AM PAPER 7
Early Immunotypes Identify Trauma-Tolerant and Trauma-Sensitive Patients with Orthopaedic Injuries
Todd O. McKinley, MD; Greg E. Gaski, MD;
Yoram Vodovotz, PhD; Timothy R. Billiar, MD

10:53 AM PAPER 8
Intramedullary Nailing Alters Pulmonary Neutrophil Deposition and Cell Surface Receptor Expression in Experimental Orthopedic Trauma in Rats
Michel Teuben; Martijn Hofman;
Johannes Greven; Zhi Qiao; Alba Shehu;
Kai O. Jensen, MD; Frank Hildebrand, MD;
Roman Pfeifer, MD;
Hans-Christoph Pape, MD

10:59 AM PAPER 9
Local Versus Systemic Inflammation in a Standardized Porcine Trauma Model: Is There a Discernible Effect of the Magnitude of Injuries?
Sascha Halvachizadeh, MD;
Michel Teuben; Yannik Kalbas;
Frank Hildebrand, MD; Paolo Cinelli, PhD;
Roman Pfeifer, MD;
Hans-Christoph Pape, MD

11:06 AM Discussion
Walk to Room 401-404

11:25 AM – INDUSTRY LUNCH
12:25 PM Principles of Proximal Humeral Fracture Fixation: A Case-Based and Comparative Review of Current Technologies in Plating and Nailing
Presenter: Frank Liporace, MD
Box Lunch Provided by OTA

Return to Room 605-607

12:35 PM – SYMPOSIUM III
1:35 PM Masquelet or Segmental Bone Defect
Moderator: Aaron Nauth, MD
Details Coming Soon

1:20 PM Discussion
1:35 PM - 2:10 PM
**PAPER SESSION III**
**Masquelet or Segmental Bone Defect**
Moderator: Aaron Nauth, MD

1:35 PM
**PAPER 10**
Is the Bioactivity of Induced Membranes Time-Dependent?
*Jan Gessmann, MD; Thomas Rosteius, MD; Kavitha Sivalingam; Dominik Seybold; Elvira Peter; Thomas A. Schildhauer, MD; Manfred Koeller*

1:41 PM
**PAPER 11**
Evaluation of Local Gene Expression in Response to the Presence of Antibiotics in a Polymethylmethacrylate Spacer
*Max Davis, MD; Mark Hake, MD; Andrea Alford*

1:47 PM
**PAPER 12**
Thermal Stability of “End of the Line” Antibiotics when used in Polymethylmethacrylate Bone Cement
*Ashley Levack, MD; Kathleen Turajane, BS; Xu Yang, MD; Andy Miller, MD; Mathias P G Bostrom, MD; David Wellman, MD*

1:53 PM - 2:10 PM
**PAPER SESSION IV**
**Infection or ABC Delivery**
Moderators: Edward J. Harvey, MD; Catherine G. Ambrose, PhD

2:25 PM - 3:05 PM
**PAPER 14**
The Potential of Metagenomic DNA Sequencing for Pathogen Identification in Orthopaedic Non-union
*Gerard Chang, MD; Timothy Tan, MD; Karan Goswami, MD; John T. Strony, BS; Keenan Sobol, BS; Brianna Fram, MD; Javad Parvizi, MD, FRCS; James C. Krieg, MD*

2:36 PM - 3:05 PM
**PAPER 15**
Antibiotic Elution from a Magnesium Phosphate Resorbable Cement
*Brandon L. Roller; James L. Cook, DVM, PhD; Aaron M. Stoker, MS, PhD*
2:42 PM  PAPER 16  
The Effects of Sterilization Techniques on Bioactivity of PMMA Antibiotic Beads Containing Vancomycin and Tobramycin  
James Chung-Jade Shaw, MD; Andrea Baker; Yesul Tina Kim, BS; Madison Milhoan; Joshua L. Gary, MD; Andrew R. Burgess, MD; Heidi B. Kaplan, PhD; Catherine G. Ambrose, PhD

2:48 PM  PAPER 17  
A Novel Diagnostic Blood Test for Acute Septic Arthritis: A Prospective Validation Study  
Blake J. Schultz, MD; Tim E. Sweeney; Melissa Remmel, MSc; Uros Midic, PhD; Malcolm DeBaun, MD; Michael J. Gardner, MD

2:54 PM  Discussion

3:05 PM  Walk to Room 401-404

3:15 PM–4:20 PM  JOINT SESSION VI: Local Delivery of Antibiotics for Bone Infections: Current Insights  
Moderators: Peter V. Giannoudis, MD, FACS, FRCS; Edward J. Harvey, MD

3:15 PM  Overview  
Peter V. Giannoudis, MD, FACS, FRCS

3:20 PM  Is There Still a Role for the Lautenbach Technique?  
Mick Dennison, MD

3:30 PM  Cement Bids and Cement Spacers: An Update  
David J. Hak, MD

3:40 PM  Bone Substitute Options and Effectiveness  
Peter V. Giannoudis, MD, FACS, FRCS

3:50 PM  Coated Nails  
Brett D. Crist, MD

4:00 PM  Matrices  
Edward J. Harvey, MD

4:10 PM  Discussion

4:20 PM  BSFF Concludes for the Day

4:20 PM–4:35 PM  KEY NOTE LECTURE  
Non-Union Decision Making  
Christian Allende, MD

4:35 PM–5:17 PM  PAPER SESSION IV  
Best of the Best - Paper Session  
Moderators: Michael D. McKee, MD; Thomas A. (Toney) Russell, MD; Cesar Pesciallo, MD

4:35 PM  Overview  
Michael D. McKee, MD

4:37 PM  PAPER 42  
Predictors of Hip Fracture Mortality in Ghana: A Single-Center Prospective Study  
Paa Kwesi Baidoo, MD; James Beguah Odei, PhD; Velarie Yaa Ankrah Ansu, MS; Michael Segbefia; Henry Holdbrook-Smith, MD
### Basic Science Focus Forum

**September 25 - 26, 2019 | Denver, Colorado | #OTA2019**

#### Course Agenda


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<tr>
<td>4:43 PM</td>
<td><strong>PAPER 43</strong>&lt;br&gt;Treatment for Coexisting Fractures of the Proximal Humerus and Humeral Shaft: ORIF or MIPPO?&lt;br&gt;Zhe Song</td>
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<td>4:49 PM</td>
<td><strong>PAPER 44</strong>&lt;br&gt;Excellent Outcome After Double Locked Plating in Su Type II or III Periprosthetic Distal Femoral Fractures&lt;br&gt;Kyeong Hyeon Park, MD; Chang-Wug Oh, MD; Ki Chul Park; Jeong Heo; Joon-Woo Kim, MD, PhD</td>
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<td>4:55 PM</td>
<td><strong>PAPER 45</strong>&lt;br&gt;Coned Hemipelvis and Total Hip Replacement in Osteoporotic Acetabular Fractures of the Elderly&lt;br&gt;Samuel Edward McMahon; Owen J. Diamond, MD; Laurence A. Cusick, FRCS (Ortho), MBCHB</td>
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<td>5:01 PM</td>
<td><strong>PAPER 46</strong>&lt;br&gt;Prospective Evaluation of Functional Outcome Along with Histological Features of Induced Membrane in Patients with Infective Nonunion Managed with Masquelet Technique&lt;br&gt;Vivek Trikha, MD; Anupam Gupta; Arulselvi Subramanian, MD</td>
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<td>5:07 PM</td>
<td>Discussion</td>
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<td>5:17 PM</td>
<td>International Trauma Care Forum&lt;br&gt;Adjourn for the Day</td>
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**Thursday, September 26, 2019**

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<tr>
<td>7:30 AM</td>
<td>Introduction&lt;br&gt;<em>Edward J. Harvey, MD</em></td>
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<td>7:35 AM–</td>
<td><strong>SYMPOSIUM V</strong>&lt;br&gt;Bone Healing Topics&lt;br&gt;<em>Moderator: Andrew Evans, MD</em></td>
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<td>8:30 AM–</td>
<td>PAPER SESSION V: Bone Healing&lt;br&gt;<em>Moderator: Andrew Evans, MD</em></td>
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<td>8:30 AM</td>
<td><strong>PAPER 18</strong>&lt;br&gt;Enhancing Bone Healing with Boron Salt&lt;br&gt;<em>Susan Mengxiao Ge, MD; Marianne Comeau-Gauthier, MD; Ore-Oluwa Olasubulumi; Jose Luis Ramirez Garcia Luna; Géraldine Merle; Edward J. Harvey, MD, MSc, FRCSC</em></td>
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You are invited to attend the International Reception from 5:25 pm – 6:25 pm in the Four Seasons Ballroom Pre-function Area on the Ballroom Level.
8:36 AM  PAPER 19
BMP2 Accelerates Healing and Prevents Infection in Two Porcine Critical Sized Defect Models
Todd O. McKinley, MD; Melissa Kacena, PhD; Paul J. Childress, PhD; Jeffrey Anglen, MD, FACS; Tien Gabriel Chu, PhD; Austin Wininger; Karl D. Shively, MD; Roman Natoli, MD

8:42 AM  PAPER 20
Osteogenic and Chondrogenic Differentiation Defects in Geriatric Human Skeletal Stem Cells from Acute Fractures
Lawrence H. Goodnough, MD; Thomas H. Ambrosi, MSc, PhD; Malachia Hoover; Michael Bellino, MD; Julius A. Bishop, MD; Michael J. Gardner, MD; Michael T. Longaker, MD; Charles K.F. Chan, PhD

8:48 AM  PAPER 21
Biocompatible ex vivo-induced Designer Fracture Hematoma for the Healing of Segmental Bone Defects Vaida Glatt; Anna Woloszyk; Kevin Tetsworth, MD

8:54 AM  PAPER 22
Unleashing β-catenin with a New Anti-Alzheimer Drug for Bone Tissue Regeneration
Marianne Comeau-Gauthier, MD; Magdalena Tarchala, MD; Jose Luis Ramirez Garcia Luna, MD; Edward J. Harvey, MD, MSc, FRCSC; Géraldine Merle, PhD

9:00 AM  Discussion

9:10 AM  Break

9:25 AM  PAPER 23
Stem-cell Based Evidence for NSAID Safety During Fracture Healing
Thomas Han Ambrosi, MSc, PhD; Lawrence H. Goodnough, MD; Michael J. Gardner, MD; Julius A. Bishop, MD; Michael Bellino, MD; Michael T. Longaker, MD; Charles K.F. Chan, PhD

9:31 AM  PAPER 24
Bioassay of Circulating Collagen X Degradation Product Correlates with Mouse and Human Fracture Healing Progression
Zachary Working, MD; Sarah Almubarak, MD; Ryan Coghlan; Jiun Chiu Chang, PhD; Aman Chopra, BA; Elizabeth R. Morris, BA; Ronen Schweitzer, PhD; William Horton, MD; Theodore Miclau, MD; Chelsea S. Bahney, PhD

9:37 AM  PAPER 25
Optimization of Autogenous Bone Grafting in the Induced Membrane Technique in a Small Animal Segmental Bone Defect Model
Hening Sun, BS; Charles Godbout, PhD; Emil H. Schemitsch, MD; Aaron Nauth, MD

9:43 AM  PAPER 26
Developing a Novel Porcine Meta-Critical Sized Bone Defect Model for Clinical Translation
Roman Natoli, MD; Melissa Kacena, PhD; Jeffrey Anglen, MD, FACS; Tien Gabriel Chu, PhD; James Patrick Fischer; Karl D. Shively, MD; Todd O. McKinley, MD
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| 9:49 AM| PAPER 27  
Reamed Irrigation-Aspiration (RIA) is Associated with Enhanced Fracture Hematoma Cell Viability and Decreased Neutrophil Maturation in Porcine Intramedullary Nailing  
Michel Teuben; Sascha Halvachizadeh, MD; Yannik Kalbas; Zhi Qiao; Nikola Cesarovic, DVM, PhD; Frank Hildebrand, MD; Paolo Cinelli, PhD; Hans-Christoph Pape, MD; Roman Pfeifer, MD |
| 9:55 AM| Discussion |
| 10:05 AM–11:05 AM| SYMPOSIUM VI  
Regulation of Orthopaedic Devices: Future Implications for Research and Innovation  
Moderator: Saam Morshed, MD |
| 10:05 AM| Overview |
| 10:10 AM| Regulatory Changes for the Industry - Europe and North America  
Robert Pogie, PhD |
| 10:20 AM| What Research does Industry Value?  
Thomas A. (Toney) Russell, MD |
| 10:30 AM| Data Assets and the Promise of Orthopaedic Trauma Registries  
Mitchell Harris, MD |
| 10:40 AM| Crowdsourcing, Contract Research, and Future Strategies for Testing and Approval of New Devices  
TBD |
| 10:50 AM| Discussion |
| 11:05 AM| Adjourn to Industry Symposia |

**CME**

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME). The Orthopaedic Trauma Association is accredited by the ACCME to provide continuing medical education for physicians.

The Orthopaedic Trauma Association designates this live activity for a maximum of 11.0 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.