

2019 OTA ANNUAL MEETING

SEPTEMBER 26 - 28, 2019 ■ DENVER, COLORADO ■ #OTA2019



BASIC SCIENCE FOCUS FORUM

COURSE AGENDA

Wednesday-Thursday,
September 25-26, 2019



Edward J. Harvey, MD,
Basic Science Committee Chair

11.0 AMA PRA Category I Credits™



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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



Early Bird Registration Until September 10.	OTA Member		Non-Member	
	On/Before 9/10/19	After 9/10/19	On/Before 9/10/19	After 9/10/19
Course Fee:	\$250	\$350	\$350	\$450

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COURSE AGENDA

Wednesday, 9.25.19

WEDNESDAY, September 25, 2019

7:30 AM Introduction (Room 605-607)
Edward J. Harvey, MD

7:35 AM–
8:35 AM **SYMPOSIUM I**
**Biomechanical Models:
Key Considerations in Study Design!**

Moderators: Emil H. Schemitsch, MD
Peter Augat, PhD

7:35 AM **What are the Most Important
Characteristics of a Good
Biomechanical Study?**
Peter Augat, PhD

7:44 AM **VE versus Composite Bone versus
Cadaver Bone: How Do I Choose?**
Michael Hast, PhD

7:53 AM **How Do I Select an Experimental
Test and FE Analysis Protocol?**
Mark Heyland, PhD

8:02 AM **Use of Biomechanics Research for
Implant Design: What are the
Pros and Cons?**
Michael Bottlang, PhD

8:11 AM **How I Use the Results of
Biomechanical Research in Clinical
Practice!**
Emil H. Schemitsch, MD

8:20 AM Discussion

8:35 AM–
9:10 AM **PAPER SESSION I**
Biomechanics - Hot Topics

Moderators: Emil H. Schemitsch, MD
Peter Augat, PhD

8:35 AM **PAPER 1**
Comparison of Three Methods for
Maintaining Inter-Fragmentary
Compression After Fracture Reduction
and Fixation in an Osteoporotic
Sawbones Model
Brendan G. Swain; Brigham K. Au, MD;
Matthew Landrum, MD;
Craig M. Birch, MD

8:41 AM **PAPER 2**
Supplemental Fixation of Supracondylar
Distal Femur Fractures: A Biomechanical
Comparison of Dual-Plate and
Plate-Nail Fixation Techniques
David Wright, MD; Donald Desanto, MD;
Michelle H. McGarry, MD;
Thay Q. Lee, PhD; John A. Scolaro, MD

8:47 AM **PAPER 3**
Dramatically Improved Strength of
Proximal Humeral Fixation with a
Tuberosity-Specific Fixation Plate
Robert Walker, MD; Paulo Castaneda, BS;
Jill Anne Goodwin, MD;
Michael D. McKee, MD, FRCSC

8:53 AM **PAPER 4**
Biomechanical Evaluation of Three
Fixation Methods for Unstable
Femoral Neck Fractures
Emily Bliven, BS; Simon Hackl, MD;
Sabrina Sandriesser; Peter Augat, PhD

8:59 AM Discussion

9:10 AM Break

9:25 AM–
10:25 AM **SYMPOSIUM II**
**The Polytrauma Patient:
Current Concepts and Evolving Care**

Moderators: Christopher Lee, MD
Justin Haller, MD

9:25 AM **Overview**

9:30 AM **Hemorrhage Control**
Todd E. Rasmussen, MD

9:40 AM **Timing of Surgery**
Hans-Christoph Pape, MD

9:50 AM **Spectrum of Coagulopathy in Trauma:
Acute Trauma-induced Coagulopathy
versus Venous Thromboembolism**
Joshua L. Gary, MD

10:00 AM **Negative Pressure Wound Therapy in
Polytrauma Patients**
James P. Stannard, MD

10:10 AM Discussion

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**COURSE
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Wednesday, 9.25.19

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



ZIMMER BIOMET

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** (Room 605-607)
1:35 PM

The Induced Membrane (Masquelet) Technique for Bone Defects: Basic Science, Clinical Evidence and Technical Issues

Moderator: *Aaron Nauth, MD*

12:35 PM **Overview**

12:40 PM **Basic Science Evidence for the Induced Membrane Technique**
J. Tracy Watson, MD

12:50 PM **The Induced Membrane Technique: Clinical Evidence**
Janet Conway, MD

1:00 PM **Indications and Contraindications for the Induced Membrane Technique**
Paul Tornetta III, MD

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AGENDA, CONT'D**
Wednesday, 9.25.19

12:35 PM– 1:35 PM **SYMPOSIUM III** (Room 605-607)
Continued

1:10 PM **The Induced Membrane Technique:
Technical Tips**
Brent Norris, MD

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 **PAPER 13**
**Effectiveness of Bioactive Ceramic
Based 3D Printing Scaffold Coating
with BMP-2 in Induced Membrane
Technique for Critical Sized Bone
Defect of Rabbit**
*Jae-Woo Cho; Beom-Soo Kim, MD;
Do-Hyun Yeo, MD; Wontae Cho;
Eic Ju Lim; Seungyeob Sakong;
Dong-Wan Kang; Imju Jeong, PhD;
Jong-Keon Oh, MD, PhD*

1:59 PM Discussion

2:10 PM Break

2:25 PM– 3:05 PM **PAPER SESSION IV**
Infection or ABC Delivery
Moderators: *Edward J. Harvey, MD
Catherine G. Ambrose, PhD*

2:25 PM **Overview**
Edward J. Harvey, MD

2:30 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 **PAPER 15**
**Antibiotic Elution from a Magnesium
Phosphate Resorbable Cement**
*Brandon L. Roller;
James L. Cook, DVM, PhD;
Aaron M. Stoker, MS, PhD*



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Wednesday, 9.25.19

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 IV: (401-404)**
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 **Cement Bids and Cement Spacers: An Update**
David J. Hak, MD

3:30 PM **Matrices**
Edward J. Harvey, 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 **The Role of Bioglass**
Nikolaos Kanakaris, MD, PhD

4:10 PM Discussion

4:20 PM BSFF Concludes for the Day



Peter Giannoudis, MD and the International Committee invite you to stay for the conclusion of the International Trauma Care Forum.

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 Ankrach Ansu, MS; Michael Segbefia; Henry Holdbrook-Smith, MD

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Wed.-Thurs., 9.25-26.19

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

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.



THURSDAY, September 26, 2019

- 7:30 AM Introduction (Room 605-607)
Edward J. Harvey, MD
- 7:35 AM–8:30 AM **SYMPOSIUM V**
Bone Healing Symposium: Advances in Biology and Technology
Moderators: *Andrew Evans, MD; Joey Johnson, MD*
- 7:35 AM **NSAIDs and Bone Healing – What is the Answer?**
Benjamin K. Potter, MD
- 7:45 AM **Metabolic Optimization – A Missed Opportunity in Bone Health? Vitamin D and Calcium Use**
Brian Mullis, MD
- 7:55 AM **Strategies to Optimize Fracture Healing When Competing with Infection**
Brett Crist, MD
- 8:05 AM **Advances in MSc Harvest for Bone Healing – Can We Make It Work Now?**
Mark Lee, MD
- 8:15 AM Discussion
- 8:30 AM–10:05 AM **PAPER SESSION V: Bone Healing**
Moderator: *Andrew Evans, MD*
- 8:30 AM **PAPER 18**
Δ Enhancing Bone Healing with Boron Salt
Susan Mengxiao Ge, MD; Lina Hadidi, MD; Marianne Comeau-Gauthier, MD; Ore-Oluwa Olasubulumi; Jose Luis Ramirez Garcia Luna; Géraldine Merle; Edward J. Harvey, MD, MSc, FRCSC

Δ OTA Grant

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**COURSE
AGENDA, CONT'D**
Thursday, 9.26.19

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 Winger;
Karl D. Shively, MD; Roman Natoli, MD

9:25 AM **PAPER 23**
Δ 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

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

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 Chiun Chang, PhD;
Aman Chopra, BA; Elizabeth R. Morris, BA;
Ronen Schweitzer, PhD;
William Horton, MD;
Theodore Miclau, MD;
Chelsea S. Bahney, 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

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

8:54 AM **PAPER 22**
Δ 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

9:43 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

9:00 AM Discussion

9:10 AM Break

Δ OTA Grant

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Thursday, 9.26.19

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?**
Roy Sanders, 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**
Vincent Devlin, MD

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.

