2017 BASIC SCIENCE FOCUS FORUM

October 11-12, 2017
(West Meeting Room 109-110)

Basic Science Committee
Edward J. Harvey, MD, Chair
Michael T. Archdeacon, MD
Mohit Bhandari, MD, PhD, FRCSC
Joseph Borrelli Jr., MD
Brett Crist, MD
Todd O. McKinley, MD
Tyler Morris, MD
Aaron Nauth, MD
Emil H. Schemitsch, MD

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

• Outline the biomechanical principles of injury
• Understand the implications of joint impact injuries
• Comprehend the clinical outcome scores used in orthopaedic research
• Discover new options for treatment of infection
• Explore the basic science and clinical outcomes of pain medication and their prescriptions
• Understand current concepts in tissue engineering.

The American Academy of Orthopaedic Surgeons designates this live activity for a maximum of 11.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.
2017 BASIC SCIENCE FOCUS FORUM

Wednesday, October 11, 2017
(West Meeting Room 109-110)

6:00 am Speaker Ready Room
(West Meeting Room 103)

6:30 am Registration
Continental Breakfast
(West Meeting Room Lobby – Outside Meeting Room)

7:30 am Introduction
Edward J. Harvey, MD, Program Chair

7:35 – 8:45 am

SYMPOSIUM 1:
BIOMECHANICS-INJURY BIOMECHANICS OF FRACTURES

Moderators: Pierre Guy, MD
Peter Cripton, PhD

7:35 am Introduction: The Test Case of Hip Fractures
Pierre Guy, MD

7:40 am How Bones Fail: Injury Biomechanics Primer
Peter Cripton, PhD

7:53 am From Finite Elements to Clinical Use:
Biofidelic Models for Hip Fracture Risk Screening
Benedikt Helgason, PhD

8:06 am The Classics: In Vitro Stress and Fracture Under Different
Loading Conditions
Luca Cristofolini, PhD

8:19 am Accounting for Reality: Biofidelic Simulations of the Sideways Fall Impact
Ingmar Fleps, MSc

8:32 am Summary and Questions
Pierre Guy, MD

Key: Δ = presentation was funded by an OTA administered grant
Names in bold = Presenter

See pages 401 - 442 for financial disclosure information.
The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.
Basic Science Focus Forum – WEDNESDAY, OCTOBER 11, 2017

10:00 am The Induced Membrane Technique: How to Optimize Outcome
Cyril Mauffrey, MD, FACS, FRCS

10:10 am Management of Soft Tissue Defects: From Minor to Extreme
Martin I. Boyer, MD

10:20 am Beyond the Fracture: Can the Patient be Optimized?
Michael D. McKee, MD

10:30 am Adjuncts to Prevent Infection: Is Anything Ready for Prime Time?
Peter V. Giannoudis, MD, FACS, FRCS

10:40 am Discussion

10:50 – 11:24 am PAPER SESSION 2: INFECTION

Moderators: Emil H. Schemitsch, MD Cyril Mauffrey, MD, FACS, FRCS

10:50 am Overview
Emil H. Schemitsch, MD

10:55 am Immune Dysregulation in a Rat Model of Infected Femoral Segmental Bone Defect
Hyunhee Ahn; Mara Schenker, MD; Rishin J. Kadakia; Pallab Pradhan; Laura D. Weinstock; Levi B. Wood; Krishnendu Roy; Robert E. Guldberg; Nick J. Willett

11:01 am Intrawound Vancomycin Powder Reduces Staphylococcus aureus Surgical Site Infections in a Rabbit Model
James Paul Hovis, MD; Robert V. O'Toole, MD; Theodore T. Manson, MD; Mark E. Shirtliff, PhD; Manjari Joshi, MD; Roman Natoli, MD

11:07 am Intrawound Vancomycin Powder Reduces Bacterial Load in Contaminated Open Fracture Model
Cyrus Theodore Caroom, MD; Dustin Moore, MD; Nithya Mudaliar, MS; Craig Winkler, MD; Jefferson Jacob Murphree, MD; Ian Ratheal, MD; Michael Fry, BS; Jessica Tullar, PhD MPH; Abdul Hamood, PhD

11:13 am Release of Vancomycin and Tobramycin from PMMA Cements Impregnated with Calcium Polyphosphate Hydrogel
David C. Markel, MD; Wei Song, PhD; Weiping Ren, PhD

11:19 am Discussion

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2:00 – 2:40 pm  
**PAPER SESSION 3: GENERAL TRAUMA**

**Moderators:** Peter V. Giannoudis, MD, FACS, FRCS  
Joseph Borrelli Jr., MD

2:00 pm  **Overview**  
Joseph Borrelli Jr., MD

2:05 pm  **Synovial Fluid Analysis Reveals a Novel Panel of Biomarkers**  
Altered Following Articular Fracture  
(p. 67)  
**PAPER**  
#9  
Steven A. Olson, MD; Bridgette D. Furman; Janet Heubner, MS; Farsh Guilak, PhD; Yi-Ju Li, PhD; Kelly Kimmerling; Yi-Hung Wu, PhD; Virginia B. Kraus, MD, PhD

2:11 pm  **Hemorrhagic Shock and Surgical Strategy (Nailing versus External Fixation)**  
Affect the Microcirculation in Soft Tissues  
(p. 68)  
**PAPER**  
#10  
Roman Pfeifer, MD; Klemens Horst, MD; Zhi Qiao; Michel Teuben; Frank Hildebrand, MD; Hans-Christoph Pape, MD

2:17 pm  **The Gut Microbiome: What Effect Does Our Diet Play in Fracture Healing?**  
(p. 69)  
**PAPER**  
#11  
Ashlee MacDonald, MD; Christopher Farnsworth, PhD Student; Eric Schott, PhD Student; Alex Grier; Steven Gill, PhD; Hani Awad, PhD; Michael Zuscik, PhD; Robert Mooney, PhD; John P. Ketz, MD

2:23 pm  **Can Intramuscular pH Levels Diagnose Acute Compartment Syndrome?**  
(p. 70)  
**PAPER**  
#12  
Christopher Doro, MD; David Hennessy, MD; Robert V. O’Toole, MD; Thomas F. Higgins, MD

2:29 pm  **Discussion**

2:40 – 3:55 pm  
**SYMPOSIUM 4: TISSUE ENGINEERING–FACT OR FICTION?**

**Moderators:** Brett D. Crist, MD, FACS  
Mark Lee, MD

2:40 pm  **Introduction**  
Brett D. Crist, MD, FACS

2:45 pm  **How to Make a Bone in 2017**  
Mark Lee, MD

3:00 pm  **Can We Get a Scaffold to Really Work?**  
Kent Leach, PhD

3:15 pm  **What are the Cartilage Options for Trauma Applications?**  
Brett D. Crist, MD

3:30 pm  **Have We Made Any Head Way in Soft Tissue Engineering?**  
Kent Leach, PhD

3:45 pm  **Discussion**

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— OTA Grant
2017 BASIC SCIENCE FOCUS FORUM

Thursday, October 12, 2017
(West Meeting Room 109-110)

6:00 am  Speaker Ready Room
          (West Meeting Room 103)

6:30 am  Registration
          Continental Breakfast
          (West Meeting Room Lobby – Outside Meeting Room)

7:30 am  Introduction
          Edward J. Harvey, MD, Program Chair

<table>
<thead>
<tr>
<th>7:35 – 8:30 am</th>
<th>SYMPOSIUM 5: PATIENT OUTCOMES IN ORTHOPAEDICS - HOW TO EVALUATE IF YOUR TREATMENT IS REALLY WORKING</th>
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<tbody>
<tr>
<td>7:35 am</td>
<td>Lower Extremity Outcomes in Trauma Patients</td>
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<td></td>
<td>Paul Tornetta III, MD</td>
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<td>7:45 am</td>
<td>Upper Extremity Outcomes in Orthopaedic Trauma</td>
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<td>Peter Cole, MD</td>
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<td>7:55 am</td>
<td>How Big of a Difference is Clinically Important?</td>
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<td>Using MCID in Orthopaedic Trauma</td>
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<td>Gerard Slobogean, MD</td>
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<td>8:05 am</td>
<td>General Health Outcomes and Economic Analysis: How to Determine if the Cost Treatment is Worth It</td>
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<td>Samir Mehta, MD</td>
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<td>8:15 am</td>
<td>The Impact of Psychosocial Factors on Outcomes in Orthopaedic Trauma</td>
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<td>William Obremskey, MD</td>
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<td>Discussion</td>
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See pages 401 - 442 for financial disclosure information.
# Basic Science Focus Forum – THURSDAY, OCTOBER 12, 2017

## PAPER SESSION 5: DOING IT BETTER

**Moderators:** Mohit Bhandari, MD, PhD, FRCSC  
Aaron Nauth, MD

### 8:30 am

**Overview**

*Aaron Nauth, MD*

### 8:35 am

**Negative Effects of Age-Related Chronic Inflammation on Skeletal Stem Cells**

*Anna Josephson, MS; Vivian Bradaschia Correa, PhD; Shane Neibart, BS; Philipp Leucht, MD*

### 8:41 am

**Effect of Nifedipine and Ketotifen on Joint Capsule Cell Based Collagen Gel Contraction**

*Kristi Billard, BSc; Mei Zhang, MD; Prism S. Schneider, MD, PhD; Dave Hart, PhD; Paul T. Salo, MD; Kevin Hildebrand, MD, FRCSC*

### 8:47 am

**Reduction in Angiogenic Support is the Primary Defect of Mesenchymal Stromal Cells Resident at the Site of Long Bone Non-Union**

*Richard James Cuthbert; Sarah M. Churchman; Penelope Castana, PhD; Hiang Boon Tan; Dennis McGonagle; Evangelia Papadimitriou, PhD; Elena Jones; Peter V. Giannoudis, MD*

### 8:53 am

**Discussion**

### 9:01 am

**An Evaluation of Bone Marrow Aspirate Concentrate in Osteointegration of Fresh Osteochondral Allografts**

*James P. Stannard, MD; James Cook, PhD; Brett D. Crist, MD*

### 9:07 am

**Femoral Neck Exposure for the Smith-Petersen Versus the Watson-Jones Approach**

*Paul Lichstein, MD, MS; John P. Kleinmeyer, MD; Michael Githens, MD; John S. Vorhies, MD; Michael J. Gardner, MD; Michael J. Bellino; Julius A. Bishop, MD*

### 9:13 am

**The Effect of Smoking Cessation on Serum Biomarkers of Fracture Healing**

*Justin Kleiner, BS; Joseph Johnson, MD; Jeremy Truntzer; Scott McAllister; Matthew Edward Deren; Mursal Gardezi; Olivia Cummings; Melanie Ambler; Dioscaris Garcia; Christopher T. Born, MD*

### 9:19 am

**Discussion**

### 9:27 am

**Refreshment Break**

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**OTA Grant**

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Basic Science Focus Forum – THURSDAY, OCTOBER 12, 2017

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<td>SYMPOSIUM 6: SCIENCE BEHIND PAIN MANAGEMENT</td>
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<td>10:35 am</td>
<td>Moderators: Todd O. McKinley, MD</td>
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<td><strong>Overview</strong></td>
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<td>Todd O. McKinley, MD</td>
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<td>9:45 am</td>
<td><strong>Current Epidemiology and Extent of Our Problems</strong></td>
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<td>Hassan Mir, MD</td>
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<td>9:55 am</td>
<td><strong>Pain Control - Pharmacology and Different Mechanisms of Pain</strong></td>
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<td>Anna Miller, MD</td>
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<td>10:05 am</td>
<td><strong>Clinical Management - Blocks, Multimodal, Medication Protocols and Contracts</strong></td>
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<td>Joseph Hsu, MD</td>
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<td>10:15 am</td>
<td><strong>Health Policy - State, Federal, Insurer and Pharmacy Regulations</strong></td>
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<td>A. Alex Jahangir, MD</td>
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<td><strong>Reliability of Proxy-Reported PROMIS Physical Function and Pain</strong></td>
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<td>Interference to Measure Outcomes in Elderly Patients Following</td>
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<td>Musculoskeletal Trauma</td>
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<td>Maria Loreto Alvarez-Nebreda, MD, PhD; Marilyn Heng, MD, MPH;</td>
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<td>Bernard Rosner, PhD; Michael F. McTague, MPH; Houman Javedan, MD;</td>
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<td>Mitchel B. Harris, MD; Michael John Weaver, MD</td>
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<td>10:46 am</td>
<td><strong>Overprescription of Opioids at Discharge in Patients After</strong></td>
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<td>Eric Chen, MD, PhD; Lulu Li, BS; Paul Tornetta III, MD</td>
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<td><strong>Prescription Reporting with Immediate Medication Utilization Mapping</strong></td>
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<td>(PRIMUM): Impact of an Alert on Controlled Substance Prescribing</td>
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<td>Rachel Seymour, PhD; Meghan Kusper Wally, MPH; Sharon Schiro, PhD;</td>
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<td>Joseph R. Hsu, MD; PRIMUM Group</td>
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<td>10:58 am</td>
<td>Discussion</td>
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<td>11:05 am</td>
<td><strong>INDUSTRY LUNCH SYMPOSIA</strong> (On-site Registration Available)**</td>
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