2015 Basic Science Committee
Edward J Harvey, MD, Chair
Mohit Bhandari, MD; Joseph Borrelli Jr, MD;
Todd O McKinley, MD; Aaron Nauth, MD;
Emil H Schemitsch, MD; Brett D Crist, MD

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.

Attendees of this activity can earn up to 11.5 AMA PRA Category 1 Credits™

Objectives
Upon successful completion of the Basic Science Focus Forum, you will be able to:
- Understand the complex physiological issues associated with polytrauma patients
- Comprehend the changing treatment and diagnostic parameters for critical size bone defects
- Recognize the best indications for absolute or relative fixation in fracture management
- Review the biomechanical principals in directed fixation for controversial fractures and subluxations
- Appreciate what other musculoskeletal conditions we need to treat in trauma
- Identify how research may change your practice

Wednesday, October 7, 2015
6:30 am Registration
7:30 am Introduction
Edward J Harvey, MD, Program Chair

7:35 am - 8:45 am Symposium 1
Management of Polytraumatized Patients with Severe Wounds
Moderators: Todd O McKinley, MD
Timothy Billiar, MD

8:45 am - 9:24 am Paper Session 1
Biomechanically-Directed Fixation
Moderators: Todd McKinley
Timothy Billiar, MD

8:45 am Overview
Timothy Billiar, MD

8:50 am Paper 1
Cytokines as Predictors of Multiple Organ Dysfunction Syndrome of Polytrauma Patients – Osteoprotegerin and Lipocalin-2 better than Interleukin-6?
Marcel Winkelmann, MD; Henning Peters; Christian Macke, MD; Philipp Mommsen, MD; Christian Zeckey, MD; Christian Schröter, MD; Christian Krettek, MD; Claudia Neunaber, MD

8:56 am Paper 2
A Severe Hemorrhagic Shock Leads to a Delayed Fracture Healing and Biomechanical Instability in a Murine Model
Katrin Bundkirchen, MS; Luisa Schäck, MD; Sandra Noack, MD; Christian Krettek, MD; Claudia Neunaber, MD

9:02 am Paper 3
Vancomycin and Imipenem Release from Nails Covered with Antibiotic-loaded Acrylic Cement Pharmacokinetic Study
Jorge Barla, MD; Luciano Rossi, MD; Carlos Sancineto, MD

9:08 am Paper 4
Elution Characteristics of PMMA Bone Cement IM Spacers Impregnated with Vancomycin and Tobramycin
Andrew Patton, MD; Brandon Perez, MD; William Buford, PhD

9:14 am Discussion
9:24 am Break
### Symposium 2

**9:45 am - Paper 8**  
Comparative Analysis of Thrombopoietin (TPO), a Novel Agent to Heal Segmental Bone Defects, with Bone Morphogenetic Protein-2 (BMP-2): A Hypothesis  
**Nabarun Chakraborty, MS; Rasha Hammamieh, PhD; Duncan Donohue, PhD; Todd McKinley, MD; Paul Childress, PhD; Benjamin Corona, PhD; Tien-Min Chu, DDS; PhD; Melissa Kacena, PhD**

**11:19 am - Paper 9**  
BMP-2 Increases Survival of Mesenchymal Stem Cells and Fracture Healing when Deployed in Photopolymerizable Hydrogels  
**Motasem Refaat, MD; Nina Vollmer, PhD; Steve Ho, BS; Eben Alsberg, PhD; Kent Leach, PhD; Mark Lee, MD**

### Discussion

**11:35 am**

**1:40 pm - Paper Session 3**

**11:30 am - Symposium 3**

**12:00 pm - Paper 10**  
Controlled Axial Dynamization with a Novel Active Locking Plate can Deliver Faster and Stronger Healing  
**Michael Bottlang, PhD; Stanley Tsai, MS; Anika Drechsler, BS; Brigitte von Rechenberg, DVM; Manuel Asch, BS; Daniel Fitzpatrick, MS, MD; Peter Augat, PhD; Steven Madey, MD**

### Paper Session 2

**10:50 am - Paper 5**  
Effect of External Beam Irradiation on the Pathway of Bone Fracture Healing  
**Yongren Wu, PhD; Evan Hanna, MD; Daniel McDonal, MS; Kenneth Vanek, PhD; Hai Yao, PhD; Vincent Pellegrini, MD**

**11:01 am - Paper 6**  
Novel PTH Based Bone Graft Substitute for Treatment of Fractures – Results from a Large Ovine Tibial Plateau Defects Study  
**Jason Schense, PhD; Brigitte von Rechenberg, DVM; Martin Staub, PhD; Stephen Ferguson, Prof PhD**

**11:07 am - Paper 7**  
Pharmaceutical and Genetic Depletion of Sclerotin and the Effect on Fracture Healing  
**Mohammad Alzahrani, MD, MSc; Reggie Hamdy, MB, MSc (Ortho.), FRCS(C)**

### Critical Size Bone Defects

**9:45 am - Symposium 2**

**11:35 am - Paper 8**  
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### Discussion

**11:35 am**

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### Paper Session 4

#### Biomechanics

| Time   | Paper Session 4
|--------|-----------------|
| 3:45 pm | Overview
| 3:50 pm | The Effect of Varying Tension of a Suture Button Construct in Fixation of the Tibiofibular Syndesmosis - Evaluation Using Stress Computed Tomography
| 3:56 pm | Anatomic Ligament Repair Restores Ankle and Syndesmotic Rotational Stability as Much as Syndesmotic Screw Fixation

**Moderators:**
- Emil Schemitsch, MD
- Michael Bottlang, MD

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### Basic Science Focus Forum, continued

- **1:51 pm**  
  **Paper 11**  
  A Biomechanical Comparison of Standard versus Far Cortical Locking Screws in a Periprosthetic Distal Femur Fracture  
  Kimberly Jacobsen, MD; J Bledsoe, PhD; Heidi Israel, PhD, RN; Jeffrey Whiting, MD; Lisa Cannada, MD

- **1:57 pm**  
  **Paper 12**  
  In Vivo Correlation of RUST Scoring with Biomechanical Strength of Nailed Tibia Fractures: Can We Finally Define Union Radiographically?  
  Paul Tornetta, MD; Jody Litrenta, MD; William Ricci, MD; Roy Sanders, MD; Robert O'Toole, MD; Henry Faber, MS; Jason Nascone, MD

- **2:03 pm**  
  **Paper 13**  
  The Biomechanical Advantage of Locked versus Non-locked Symphyseal Plating of Unstable Pelvic Ring Injuries  
  Ryan Godinsky, MD; Gregory Vrabec, MD; Loredana Guseila, BS; Danielle Filipkowski, MS; John Elias, PhD

- **2:09 pm**  
  Discussion

- **2:19 pm**  
  Break

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#### Symposium 4

**Biomechanical - Hot Topics 2015**

**Moderators:**
- Emil Schemitsch, MD
- Michael Bottlang, MD

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<td>Paper 17</td>
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#### Paper 14

The Effect of Varying Tension of a Suture Button Construct in Fixation of the Tibiofibular Syndesmosis - Evaluation Using Stress Computed Tomography

**Authors:**
- John Morello, MBBS (Hons);
- Hakim Louati, MSc;
- Andrew Bodrog, MD;
- Andrew Stewart, MD;
- Steven Papp, MD FRCP(C);
- Allan Liew, MD, FRCSI;
- Wade Gotton, MD, FRCP(C)

#### Paper 15

Anatomic Ligament Repair Restores Ankle and Syndesmotic Rotational Stability as Much as Syndesmotic Screw Fixation

**Authors:**
- Patrick Schottel, MD;
- Josh Baxter, PhD;
- Susannah Gilbert, MS;
- Matthew Garner, MD; Dean Lorich, MD

#### Paper 16

Initial Stiffness of Bicortical Locked Screw versus Unicortical Locked Screw and Graft-Cable Fixation of Comminuted Vancouver C Periprosthetic Fractures: A Biomechanical Study

**Authors:**
- Michael Beebe, MD; David Hulet, BS;
- Casey Whale, BS; Sean Tagge, BS;
- Jeremy Gilliland, MD; Erik Kubiak, MD

#### Paper 17

Comparison of Three Methods for Maintaining Inter-fragmentary Compression after Fracture Fixation

**Authors:**
- Brigham Au, MD; John Groundland, MD;
- Brandon Santoni, PhD; Kyle Stoops, MD; H Claude Sagi, MD

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**Pre-Registration Deadline September 30, 2015; On-site Registration - additional $100. See Page 59.**
Thursday, October 8, 2015

7:25 am Introduction
Edward J Harvey, MD, Program Chair

7:30 am - Symposium 5
8:20 am What’s Important Besides Getting the Bone to Heal?
Moderators: Brett D Crist, MD
Mark A Lee, MD

7:30 am What to Do When the Articular Cartilage Doesn’t Heal or Can’t Be Reconstructed?
James P Stannard, MD

7:40 am Periarticular Knee Fractures: Ligamentous Stability Affects Success
William Harvin, MD

7:50 am Fractures Don’t Heal without Soft Tissue Coverage: Understanding the Soft Tissue Reconstructive Ladder
Michael J Gardner, MD

8:00 am Muscular Recovery: How Much is Lost with Injury?
Thomas Higgins, MD

8:10 am Discussion

8:20 am - Paper Session 5
9:22 am Besides Bone Healing
Moderators: Brett D Crist, MD
Mark A Lee, MD

8:20 am Overview

8:25 am Paper 20
Autologous Minced Muscle Treatment of Volumetric Muscle Loss Improves Neuromuscular Strength
Jennifer McDaniel, PhD; Catherine Ward, PhD; Joseph Wenke, PhD; Benjamin Corona, PhD

8:31 am Paper 21
Comparison Between Supra-patellar and Para-patellar Approach for Proximal Tibia Fractures: Cadaveric Study
Rodolfo Zamora, MD; Craig Wright, MD; Adam Short, MD; David Seligson, MD

8:37 am Paper 22
Blind Area of Reverse-L Posteromedial Approach Compare with Posterolateral Approach for Posterolateral Tibial Plateau Fractures: A Cadaveric Study
 Wich Orapiriyakul, MD; Theerachai Apivatthakakul, MD
8:43 am  
**Paper 23**  
The Safety and Feasibility of Minimally Invasive Plate Osteosynthesis (MIPO) on the Medial Side of the Femur: A Cadaveric Injection Study  
*Theerachai Apivatthakakul, MD*

8:49 am  
**Discussion**

8:54 am  
**Paper 24**  
Under Pressure: The Utility of Splitting Fiberglass Casts  
*Kevin Kleis, DO; John Schlechter, DO; Joshua Doan, MEng; Christine Farnsworth, MS; Eric Edmonds, MD*

9:00 am  
**Paper 25**  
Targeted Stimulation of Retinoic Acid Receptor Signaling Mitigates the Formation of Heterotopic Ossification Formation in an Established Blast-Related Traumatic Injury Model  
*Gabriel Pavey, MD; Ammar Qureshi, PhD; Allison Tomasino, BS; Danett Bishop, PhD; Masahiro Iwamoto, PhD; Maurizio Pacifici, PhD; Benjamin Potter, MD; Thomas Davis, PhD; Jonathan Forsberg, MD*

9:06 am  
**Paper 26**  
Transforming Growth Factor-b2 Gene Expression Early may be Predictive of the Severity of Future Development of Heterotopic Ossification  
*Ronald Goodlett, MD; Patrick Jones, MD; Youngmi Ji, PhD; Daniel Griffin, MD; Leon Nesti, MD, PhD; Husain Bharmal, MD*

9:12 am  
**Discussion**

9:22 am  
**Break**

9:40 am - 10:10 am  
**Symposium 6**  
**Does Research Change Practice?**  
**Moderators:**  
*Mohit Bhandari, MD*  
*Edward J Harvey, MD*

9:40 am  
**Orthopaedic Research Funding Trends – Is Trauma Getting its Fair Share?**  
*Mitchell Bernstein, MD*

9:50 am  
**6 Clinical Research Papers That Have Influenced My Practice**  
*Michael T Archdeacon, MD*

10:00 am  
**6 Clinical Research Papers That Have Influenced My Practice**  
*Steven R Papp, MD*

10:10 am  
**Does Level I Evidence Mean “I Should Change my Practice?”**  
*Peter Giannoudis, MD*

10:20 am  
Are Journals the Future Source of Practice-Changing Evidence?  
*Roy Sanders, MD*

10:30 am  
**Discussion**

10:40 am - 11:10 am  
**Paper Session 6**  
**New Technology and Research**  
**Moderators:**  
*Edward J Harvey, MD*  
*Peter V Giannoudis, MD*

10:40 am  
**Overview**

10:45 am  
**Paper 27**  
Repetitive Reduction Lead to Significant Elevated IL-6 Levels in Femoral Fractures: A Quantitative Analysis of a Robot-Assisted Reduction Process in a Rat Model  
*Claudia Neunaber, MD; Ralf Westphal, MD; Christian Krettke, MD; Thomas Goesling, MD; Philipp Haas, MD; Katrin Bundkirchen, MS*

10:51 am  
**Paper 28**  
Carbon Monoxide Releasing Molecule-3 (CORM-3) Protects the Skeletal Muscle in Porcine Model of Compartment Syndrome  
*Aurelia Bihari, MSc; Gediminas Cepinskas, DVM, PhD; David Sanders, MD; Abdel-Rahman Lawendy, MD, PhD*

10:57 am  
**Paper 29**  
The Effect of Iron Chelators on Bioceramic Bone Graft Remodeling  
*Justin Drager, MDCM; Zeeshan Sheikh, PhD; Yu Ling Zhang, MSc; Abhishek Kumar, MD; Edward Harvey, MD, MSc, FRCSC; Jake Barralet, PhD*

11:03 am  
**Discussion**

11:10 am  
**ADJOURN TO INDUSTRY SYMPOSIA**  
**Registration Required**  
(Boxed lunch available)