



# Eastern Orthopaedic Association

## 43<sup>rd</sup> Annual Meeting

June 20-23, 2012

The Sagamore on Lake George  
Bolton Landing, New York

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# 2012

## Meeting Program

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*Please notify the EOA Central Office of any changes in your home or office address.*

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint Sponsorship of the American Academy of Orthopaedic Surgeons and the Eastern Orthopaedic Association. 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 26.75 *AMA PRA Category 1 Credits*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.



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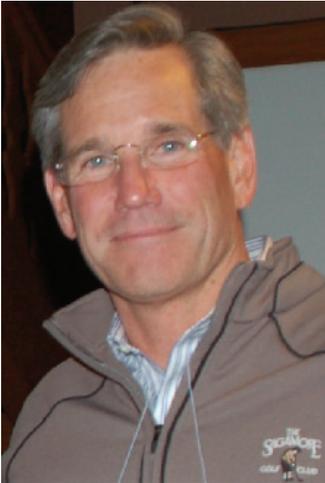


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## *EOA President's Message*

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### *Dear EOA Colleagues:*



*Henry A. Backe Jr., MD*

Welcome to The Sagamore on Lake George at Bolton Landing. Thanks for attending the 43rd EOA Annual Meeting. Tara and I are delighted to be your host and hostess. The Sagamore staff are ready to make your stay enjoyable and comfortable. The opening reception is Thursday night and will give us all an opportunity to catch up and kick off this year's meeting in a relaxed atmosphere overlooking the Lake.

John Kelly, MD, our Program Chairman, has done a great job in organizing the scientific program. It is packed with CME educational opportunities for the subspecialist, the general orthopaedist and our allied health professionals. The AAOS has approved 26.75 CME credits for the meeting. There are symposia on cartilage, hip arthroscopy, joint arthroplasty, DVT prophylaxis, wrist fixation, and more. We accepted 80 podium presentations and 42 poster exhibits. Don't miss the short videos on "How to" throughout the meeting and the special guest mini lectures. Case presentations will be available each morning. Instructional courses geared toward the residents and fellows will be held in the afternoons. We have industry sponsored non-CME workshop lunches available Thursday and Friday.

We are grateful to Arthrex for their commitment to bring the mobile lab to our conference center. Please take advantage of these instructional cadaver labs. Sessions will be scheduled throughout each day both in the mornings and afternoons. You should sign up as soon as possible since space will be limited.

The Howard Steel lecture will be given on Thursday by Mr. Dan Pelino and Ms. Christine Kretz, both from IBM. They will introduce you to the powers of Watson, IBM's artificial intelligence computer. Our Presidential Guest Speaker, Mr. Derek McMinn, well known for his work on hip resurfacing, will speak on Friday.

The EOEf annual golf outing will be held on Friday at the 1928 Donald Ross designed golf course overlooking the resort and lake. In classic Ross fashion, The Sagamore golf course uses the natural environment to give each hole its challenge and beauty. From the elevated first tee, you have a breathtaking view of Lake George and the Adirondack peaks. The course will also be available for play during our entire stay.

We have also set up various recreational activities during your stay at The Sagamore. The tour to Fort Ticonderoga will take you back to the eras of the French and Indian War, Revolutionary War, and the 18th Century. It will be a great trip for the entire family if you choose to go. We have kayak tours and fishing charters arranged that will be available from the resort docks. Don't miss the Adirondack Extreme Experience with zip lines, suspended bridges, slides and more! There are water parks, museums, outlet stores, steamboat cruises, white water rafting and even a Six Flags all in the Lake George region. Check out this website for details: <http://www.visitlakegeorge.com/things-to-do>.

Our traditional Saturday Founders' Dinner Dance will feature the EOA Jazz Band during cocktails. Tara and I will introduce David and Susan Zelouf as our incoming President and First Lady that evening. A silent auction will be held that night for the benefit of the EOEf.

I hope you and your families enjoy your time at The Sagamore and go home with another fond memory of the EOA!

Sincerely,

*Henry A. Backe, MD*

President, Eastern Orthopaedic Association

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## Meeting-at-a-Glance

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*Times and locations are subject to change.*

*Badges or wristbands are required for admittance to all events.*

### WEDNESDAY, JUNE 20, 2012

6:30am–8:00am	<b>President’s Council Meeting</b> ( <i>Triuna A &amp; B</i> )
8:00am–12:00pm	<b>Board of Directors Meeting</b> ( <i>Triuna A &amp; B</i> )
9:00am–10:00am	<b>Spouse’s Board Meeting</b> ( <i>Abenia B</i> )
12:00pm–5:00pm	<b>Meeting Registration</b> ( <i>Ballroom Foyer</i> )
12:00pm–5:00pm	<b>Sponsor/Exhibit Setup</b> ( <i>Nirvana Room, Wapanak Room, and Ballroom Foyer</i> )
12:00pm–5:00pm	<b>Speaker Ready Room</b> ( <i>Ballroom Foyer</i> )
12:00pm–5:00pm	<b>Scientific Poster Setup</b> ( <i>Abenia and Evelley Rooms</i> )

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### THURSDAY, JUNE 21, 2012

5:45am–4:35pm	<b>Meeting Registration</b> ( <i>Ballroom Foyer</i> )
5:45am–5:00pm	<b>Speaker Ready Room</b> ( <i>Ballroom Foyer</i> )
6:00am–4:35pm	<b>Scientific Program</b> ( <i>Bellvue Room</i> ) ( <i>See pages 7-8 for details.</i> )
6:00am–2:35pm	<b>Technical Exhibits, Continental Breakfast, Coffee Breaks, and Daily Drawing</b> ( <i>Nirvana Room, Wapanak Room, and Ballroom Foyer</i> ) The drawing will take place at the end of the second break in the exhibit area. You must be present to win!
7:00am–7:15am	<b>First Business Meeting</b> ( <i>Bellvue Room</i> )
7:18am–2:35am	<b>Concurrent Sessions</b> ( <i>Triuna Room</i> )
8:30am	<b>Morning Walk*</b> ( <i>Meet in the Lobby</i> )
9:00am–10:30am	<b>Spouse/Children Hospitality*</b> ( <i>Shelving Rock Terrace</i> )
10:35am–11:05am	<b>Presidential Address</b> ( <i>Bellvue Room</i> )
11:05am–12:05pm	<b>Howard Steel Lecture</b> ( <i>Bellvue Room</i> )
12:05pm–1:00pm	<b>Industry Luncheon — ConvaTec*</b> ( <i>Bellvue Room</i> ) CME credit not available
12:45pm–4:45pm	<b>Guided Kayak Tour*</b> ( <i>Meet in the Lobby</i> )
1:00pm–1:45pm	<b>Industry Workshop — Cadence Pharmaceuticals Inc.*</b> ( <i>Bellvue Room</i> ) CME credit not available
1:30pm–5:30pm	<b>Fishing Charters*</b> ( <i>Meet at Boat Dock</i> )
2:00pm–5:45pm	<b>Fort Ticonderoga*</b> ( <i>Meet in the Lobby</i> )
4:35pm–5:35pm	<b>Scientific Poster Session</b> ( <i>Abenia and Evelley Rooms</i> ) Note: Presenters will be available to answer questions.
4:35pm–5:35pm	<b>Multimedia Education Session</b> ( <i>Ballroom Foyer</i> )

\* See Activities Information on pages 9-10 for more details.

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6:15pm–7:00pm	<b>New Member Reception*</b> ( <i>Veranda Overlook</i> )
7:00pm–10:00pm	<b>Welcome Reception*</b> ( <i>Pool Terrace and Veranda Upper Terrace</i> )

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**FRIDAY, JUNE 22, 2012**

5:45am–2:08pm	<b>Meeting Registration</b> ( <i>Ballroom Foyer</i> )
5:45am–4:00pm	<b>Speaker Ready Room</b> ( <i>Ballroom Foyer</i> )
6:00am–7:00am	<b>Regional and AAOS President’s Breakfast Meeting with State Presidents and Board of Councilors</b> ( <i>Dollar Island</i> )
6:00am–2:08pm	<b>Scientific Program</b> ( <i>Bellvue Room</i> ) ( <i>See pages 7-8 for details.</i> )
6:00am–2:08pm	<b>Technical Exhibits, Continental Breakfast, Coffee Breaks, and Daily Drawing</b> ( <i>Nirvana Room, Wapanak Room, and Ballroom Foyer</i> ) The drawing will take place at the end of the second break in the exhibit area. You must be present to win!
7:00am–2:08pm	<b>Concurrent Sessions</b> ( <i>Triuna Room</i> )
8:30am	<b>Morning Walk*</b> ( <i>Meet in the Lobby</i> )
9:30am	<b>Book Discussion on Winter Garden by Kristin Hannah*</b> ( <i>Shelving Rock Terrace</i> )
10:30am	<b>Party Bridge*</b> (All Levels Welcome) ( <i>Shelving Rock Terrace</i> )
10:55am–11:45am	<b>Presidential Guest Speaker</b> ( <i>Bellvue Room</i> )
11:45am–12:45pm	<b>Industry Luncheon — Auxilium Pharmaceuticals, Inc.*</b> ( <i>Bellvue Room</i> ) CME credit not available
12:30pm–5:30pm	<b>Golf Tournament*</b> ( <i>Meet at the Golf Course</i> )
1:30pm–4:00pm	<b>Thomas Mountain Guided Hiking*</b> ( <i>Meet in the Lobby</i> )
2:00pm–3:00pm	<b>Scientific Poster Session</b> ( <i>Abenia and Evelley Rooms</i> ) Note: Presenters will be available to answer questions.
3:00pm–4:00pm	<b>Multimedia Education Session</b> ( <i>Ballroom Foyer</i> )
5:30pm–7:30pm	<b>Exhibitor and Poster Reception*</b> ( <i>Nirvana Room, Wapanak Room, and Ballroom Foyer</i> )
5:30pm–7:30pm	<b>Kids’ Movie and Arts &amp; Crafts*</b> ( <i>Triuna Room</i> )

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**SATURDAY, JUNE 23, 2012**

5:45am–2:15pm	<b>Meeting Registration</b> ( <i>Ballroom Foyer</i> )
5:45am–2:15pm	<b>Speaker Ready Room</b> ( <i>Ballroom Foyer</i> )
6:00am–7:00am	<b>Board of Directors Meeting</b> ( <i>Triuna A &amp; B</i> )
6:00am–2:15pm	<b>Scientific Program</b> ( <i>Bellvue Room</i> ) ( <i>See pages 7-8 for details.</i> )
6:00am–2:00pm	<b>Technical Exhibits, Continental Breakfast, Coffee Breaks, and Daily Drawing</b> ( <i>Nirvana Room, Wapanak Room, and Ballroom Foyer</i> ) The drawing will take place at the end of the first break in the exhibit area. You must be present to win!
7:00am–7:20am	<b>Second Business Meeting</b> ( <i>Bellvue Room</i> )
7:20am–1:10pm	<b>Concurrent Sessions</b> ( <i>Triuna Room</i> )

\* See Activities Information on pages 9-10 for more details.

8:30am	<b>Morning Walk*</b> ( <i>Meet in the Lobby</i> )
1:15pm–5:15pm	<b>Adirondack Extreme*</b> ( <i>Meet in the Lobby</i> )
1:30pm–5:30pm	<b>Fishing Charters*</b> ( <i>Meet at the Boat Dock</i> )
2:00pm–4:00pm	<b>Tennis Round Robin*</b> ( <i>Meet at the Tennis Courts</i> )
2:30pm–3:30pm	<b>Scientific Poster Session</b> ( <i>Abenia and Evelley Rooms</i> ) Note: Presenters will be available to answer questions.
3:30pm–4:30pm	<b>Multimedia Education Session</b> ( <i>Ballroom Foyer</i> )
7:00pm–8:00pm	<b>Jazz Band Reception*</b> ( <i>Ballroom Foyer</i> )
8:00pm–11:00pm	<b>Founders' Dinner Dance*</b> ( <i>Bellvue and Nirvana Rooms</i> )
7:00pm–11:00pm	<b>Kids' Movie and Arts &amp; Crafts*</b> ( <i>Triuna Room</i> )

\* See Activities Information on pages 9-10 for more details.

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## *Scientific Program Agenda*

*Presenters and times are subject to change.*

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### THURSDAY, JUNE 21, 2012

- 6:00am–7:00am      **General Session I — Case Reviews** (*Bellvue Room*)
- 7:00am–7:15am      **First Business Meeting** (*Bellvue Room*)
- 7:18am–8:50am      **Concurrent Symposia I — Cartilage** (*Bellvue Room*)
- 7:18am–8:50am      **Concurrent Session II — Arthroplasty** (*Triuna Room*)
- 8:50am–9:10am      **Break — Please visit with exhibitors** (*Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer*)
- 9:10am–10:15am      **Concurrent Session III — Sports Shoulder** (*Bellvue Room*)
- 9:10am–10:15am      **Concurrent Session IV — Knee Arthroplasty** (*Triuna Room*)
- 10:15am–10:35am      **Break — Please visit with exhibitors** (*Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer*)
- 10:35am–11:05am      **General Session V — Presidential Address & Howard Steel Lecturer** (*Bellvue Room*)
- 12:05pm–1:00pm      **Industry Luncheon — ConvaTec** (*Bellvue Room*)  
CME credit not available
- 1:00pm–1:45pm      **Industry Workshop — Cadence Pharmaceuticals Inc.** (*Bellvue Room*)  
CME credit not available
- 1:45pm–2:35pm      **Concurrent Symposia II — Upper Extremity** (*Bellvue Room*)
- 1:45pm–2:35pm      **Concurrent Symposia III — General/Trauma** (*Triuna Room*)
- 2:35pm–4:35pm      **Symposia IV — Bearing Surface Options in THA** (*Dollar Island*)
- 4:35pm–5:35pm      **Scientific Poster Session** (*Abenia and Evelley Rooms*)  
Note: Presenters will be available to answer questions.
- 4:35pm–5:35pm      **Multimedia Education Session** (*Foyer Area*)

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### FRIDAY, JUNE 22, 2012

- 6:00am–7:00am      **General Session VI — Case Reviews** (*Bellvue Room*)
- 7:00am–8:00am      **Concurrent Symposia V — Hip Arthroscopy** (*Triuna Room*)
- 7:00am–8:00am      **Concurrent Symposia VI — DVT Prophylaxis Across Specialties** (*Bellvue Room*)
- 8:00am–8:20am      **Break — Please visit with exhibitors** (*Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer*)
- 8:20am–10:05am      **Concurrent Session VII — Sports Medicine/Shoulder** (*Bellvue Room*)
- 8:20am–10:05am      **Concurrent Session VIII — General/Basic Science** (*Triuna Room*)
- 10:05am–10:25am      **Break — Please visit with exhibitors** (*Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer*)
- 10:25am–11:45am      **General Session IX — AAOS Report, Special Lecture, & Presidential Guest Speaker** (*Bellvue Room*)
- 11:45am–12:45pm      **Industry Luncheon — Auxilium Pharmaceuticals, Inc.** (*Bellvue Room*)  
CME credit not available

12:45pm–2:00pm	<b>Concurrent Symposia VII — Shoulder Elbow</b> ( <i>Triuna Room</i> )
12:45pm–2:08pm	<b>Concurrent Symposia VIII — Arthroplasty</b> ( <i>Bellvue Room</i> )
2:00pm–3:00pm	<b>Scientific Poster Session</b> ( <i>Abenia and Evelley Rooms</i> ) Note: Presenters will be available to answer questions.
3:00pm–4:00pm	<b>Multimedia Education Session</b> ( <i>Foyer Area</i> )

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**SATURDAY, JUNE 23, 2012**

6:00am–7:00am	<b>General Session X — Case Reviews</b> ( <i>Bellvue Room</i> )
7:00am–7:20am	<b>Second Business Meeting</b> ( <i>Bellvue Room</i> )
7:20am–8:10am	<b>Concurrent Session XI — Lower Extremity/Trauma</b> ( <i>Bellvue Room</i> )
7:20am–8:10am	<b>Concurrent Session XII — Knee</b> ( <i>Triuna Room</i> )
8:10am–8:15am	<b>Change Rooms</b>
8:15am–9:05am	<b>Concurrent Session XIII — General</b> ( <i>Triuna Room</i> )
8:15am–9:05am	<b>Concurrent Session XIV — Arthroplasty</b> ( <i>Bellvue Room</i> )
9:05am–9:35am	<b>Break — Please visit with exhibitors</b> ( <i>Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer</i> )
9:35am–10:35am	<b>Symposia IX — Joint Preservation: Shoulder and Elbow</b> ( <i>Bellvue Room</i> )
10:35am–11:05am	<b>General Session XV — Reports, BOC and OREF</b> ( <i>Bellvue Room</i> )
11:05am–11:10am	<b>Change Rooms</b>
11:10am–11:55am	<b>Concurrent Symposia X — General Trauma</b> ( <i>Triuna Room</i> )
11:10am–11:55am	<b>Concurrent Symposia XI — Sports</b> ( <i>Bellvue Room</i> )
11:55am–12:00pm	<b>Change Rooms</b>
12:00pm–1:10pm	<b>Concurrent Session XVI — Upper Extremity</b> ( <i>Bellvue Room</i> )
12:00pm–1:10pm	<b>Concurrent Session XVII — Spine/Pediatrics</b> ( <i>Triuna Room</i> )
1:10pm–1:15pm	<b>Change Rooms</b>
1:15pm–2:15pm	<b>Symposia XII — Hand/Wrist Fixation</b> ( <i>Bellvue Room</i> )
2:30pm–3:30pm	<b>Scientific Poster Session</b> ( <i>Abenia and Evelley Rooms</i> ) Note: Presenters will be available to answer questions.
3:30pm–4:30pm	<b>Multimedia Education Session</b> ( <i>Foyer Area</i> )

## *Activities Information*

*Badges or wristbands are required for admittance to all events.*

**Thursday, June 21, 2012**

### **Morning Walk**

8:30am (*Meet in the Lobby*)

**Price:** *Included in Registration Fee*

### **Spouse/Children Hospitality**

9:00am–10:30am (*Shelving Rock Terrace*)

The IBM Watson computer beat humans at playing Jeopardy! It took nearly five years and many researchers to build Watson and train it to play the game. Imagine if you could read 200 million pages of information and answer questions in 3 seconds or less. What would you do with that super power? Find out how Watson did it and meet his “little brother” to try your hand at Jeopardy!

**Price:** *Included in Registration Fee or \$40 per Unregistered Adult; \$20 per Unregistered Child*

### **Industry Luncheon — ConvaTec**

12:05pm–1:00pm (*Bellvue Room*)

#### ***Surgical Site Infection in Total Hip and Knee Arthroplasty***

Presented by Javad Parvizi, MD, FRCS and Peter Sharkey, MD

This program will review the current issues involved in managing skin and surgical site infection in the hip and knee arthroplasty patient. It will also review current assessment and management strategies for patients and review what needs still exist in improving current methods as well as take a look at new technologies that have improved how surgeons can minimize further risk.

**Price:** *Included in Registration Fee; lunch provided (CME credit not available)*

### **Industry Workshop — Cadence Pharmaceuticals Inc.**

1:00pm–1:45pm (*Bellvue Room*)

#### ***OFIRMEV® (acetaminophen) Injection: An Acute Pain Management Tool for the Orthopedic Surgeon***

Presented by Eugene Viscusi, MD and Javad Parvizi, MD, FRCS

**Price:** *Included in Registration Fee (CME credit not available)*

### **Guided Kayak Tour**

12:45pm–4:45pm (*Meet in the Lobby*)

Afloat, Lake George is a paddler’s paradise. The pure spring fed water, majestic mountainscapes and private island

retreats offer vistas seldom seen from land. Single and double kayaks available – list preference when signing up. Under 12 years of age must be in a double kayak with a parent. You might get wet — wear appropriate clothing! (Lunch and beverages are not provided.)

**Price:** *\$65 per person (Maximum of 25 people)*

### **Fishing Charters**

1:30pm–5:30pm (*Meet at the Dock*).

Board a 26’ fishing boat with a true captain who knows the waters. Fish for trout, salmon, bass, and pike. Each charter is available for up to six people. Guests meet the boat at the Sagamore Waterfront Dock. Everyone must provide information to receive a NYS fishing license. (Lunch and beverages are not provided.)

**Price:** *\$120 per person*

### **Fort Ticonderoga**

2:00pm–5:45pm (*Meet in the Lobby*)

Visit the Fort Ticonderoga National Historic Landmark and come away with a deeper understanding of the French and Indian War, Revolutionary War, and the 18th Century.

In addition to touring the Fort there are a number of exhibits on display as well as the Kings’ Garden. Guests can explore the fort at their leisure. (Beverages and snacks are not provided.)

**Price:** *\$55 per Adult, \$49 per Child (7-12 years), \$42 per Child (under 7 years)*

### **New Member Reception**

6:15pm–7:00pm (*Veranda Overlook*)

All EOA new members are invited to attend this reception. The EOA Board and other leadership would like to take this opportunity to welcome you to the EOA.

**Price:** *Included in Registration Fee*

### **Welcome Reception**

7:00pm–10:00pm (*Pool Terrace and Veranda Upper Terrace*)

The Sagamore’s pool terrace area is one of the most breathtaking locations in the Northeast. With its spectacular panoramic views of Lake George and a sweeping lakeside lawn area, this is the perfect gathering place to celebrate with family and friends. While overlooking the Adirondack Mountains, enjoy refreshing cocktails along with delicious food offerings. (Attire: Casual-no jackets)

**Price:** *Included in Registration Fee or \$100 per Unregistered Adult; \$50 per Unregistered Child (5-17)*

**Friday, June 22, 2012**

**Regional and AAOS President's Breakfast Meeting with State Presidents and Board of Councilors**

6:00am–7:00am (*Triuna A & B*)

**Morning Walk**

8:30am (*Meet in the Lobby*)

**Price:** *Included in Registration Fee*

**Book Discussion on Winter Gardens by Kristin Hannah**

9:30am (*Shelving Rock Terrace*)

**Price:** *Included in Registration Fee*

**Party Bridge**

10:30am (*Shelving Rock Terrace*)

All levels welcome.

**Price:** *Included in Registration Fee*

**Industry Luncheon — Auxilium Pharmaceuticals, Inc.**

11:45am–12:45pm (*Bellvue Room*)

***Advances in the Treatment of Adults with Dupuytren's Contracture with a Palpable Cord***

Presented by Philip Blazar, MD, Associate Orthopedic Surgeon, Brigham and Women's Hospital; Assistant Professor of Orthopedic Surgery, Harvard Medical School

**Price:** *Included in Registration Fee; Lunch provided (CME credit not available)*

**Golf Tournament**

12:30pm–5:30pm (*Meet in the Lobby*)

You will enjoy the lake from a distance, hitting the links at the stunning 18-hole, Donald Ross championship golf course. Sitting on a ridge 2-1/2 miles from the hotel, the course gracefully meanders through the upland meadow and the Adirondack woods. In classic Ross fashion, the course uses the natural environment to give each hole its challenge and beauty. The undulating greens can test even the best of players. The tournament will be a shotgun start with scramble format.

**Price:** *\$175 per person (Greens fees, lunch, beverage cart and transportation included in price.)*

**Thomas Mountain Guided Hiking (Moderate)**

1:30pm–4:00pm (*Meet in the Lobby*)

Just a five-minute drive from Bolton Landing, the trails to the summits of Thomas Mountains reward hikers with outstanding views of Lake George's south and central basins and the southern Adirondacks. The trail to Thomas Mountain follows a logging road as it winds up the mountain through varying forest types for approximately 1.5 miles (3 miles round-trip), and ends at a quaint cabin that takes in the region's scenic beauty. Wear closed toe shoes. (Beverages and snacks are not provided.)

**Price:** *\$52 per person (Min. 8/Max. 24 people)*

**Exhibitor and Poster Reception**

5:30pm–7:30pm (*Nirvana Room, Wapanak Room, Ballroom Foyer, and Lobby Foyer*)

This is an opportunity to visit with the Exhibitors and view the Scientific Posters. Enjoy your favorite beverage and delicious fruits and cheeses. (Attire: Business Casual.)

**Price:** *Included in Registration Fee or \$75 per Unregistered Adult*

**Kids' Movie Party and Arts & Crafts**

5:30pm–7:30pm (*Triuna Room*)

Dinner and a movie—fun!!! Watch a great movie and nibble on snacks and treats with your friends! If younger than 5 years old, must be accompanied by an adult.

**Price:** *Included in Registration Fee or \$25 per Unregistered Child (5-17 years)*

**Saturday, June 23, 2012**

**Morning Walk**

8:30am (*Meet in the Lobby*)

**Price:** *Included in Registration Fee*

**Adirondack Extreme**

1:15pm–5:15pm (*Meet in the Lobby*)

Adirondack Extreme is a Treetop Adventure Course. The obstacle course will have a progression of elevation from 10 to 50 feet off the ground. Some of the course features include giant zip lines, suspended bridges, swings, slides, nets and even an aerial surf board. There are a variety of courses designed for children of all ages. Minimum 10 people. All children must be accompanied by a parent.

**Price:** *\$52 per Adult; \$42 per Child ages 12-17 years; \$33 per Child ages 7-11 years (includes transportation and admission.)*

**Fishing Charters**

1:30pm–5:30pm (*Meet at the Dock*)

Board a 26' fishing boat with a true captain who knows the waters. Fish for trout, salmon, bass and pike. Each charter is available for up to six people. Guests meet the boat at the Sagamore Waterfront Dock. Everyone must provide information to receive a NYS fishing license. (Lunch and beverages are not provided.)

**Price:** *\$120 per person*

**Tennis Round Robin**

2:00pm–4:00pm (*Meet at the Tennis Courts*)

**Price:** *\$20 per person*

**Jazz Band Reception (Sagamore Ballroom Foyer) and Founders' Dinner Dance (Bellvue and Nirvana Rooms)**

7:00pm–11:00pm

The evening begins with a lovely reception and music brought to you by the EOA Jazz Band. The Jazz Band plays popular jazz tunes that will be enjoyed by all. Dinner will also be an event to remember with a delicious meal, good company, and dancing music. EOA is pleased to announce

an exciting way to assist EOEf in raising dollars. We will be having a silent auction during the Founders' Reception and Dinner. Please make sure to get your bid in early for great prizes including — tickets to sports functions, a signed football, a room at the Loew's Hotel Miami, reproduction of Leonardo DaVinci's Vitruve, and a stay at a vacation home. (Attire: Black Tie Preferred.)

**Price:** *Included in Registration Fee or \$150 per Unregistered Adult/\$75 Surcharge per Registered Child (5-17)*

### **Kids' Movie and Arts & Crafts**

7:00pm–11:00pm (*Triuna Room*)

While your parents are at the Founders' Dinner, enjoy dinner and crafts or a movie with your friends. Children younger than 5 years old must be accompanied by an adult. This is not a babysitting service, but provided only for parents attending the Founders' Dinner. Children must be registered.

**Price:** *Included in Registration Fee or \$25 per Unregistered Child (5-17 years)*

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## *Meeting Information*

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### **FORMAT**

The educational sessions will be held June 21-23, 2012, from approximately 6:00am until 4:00pm.

### **TARGET AUDIENCE**

The 43<sup>rd</sup> Annual Meeting of the Eastern Orthopaedic Association has been developed primarily for orthopaedic and trauma surgeons. Physician Assistants, LPNs, and Physical Therapists would also benefit from this program.

### **SPEAKER READY ROOM**

The Speaker Ready Room is available 24 hours a day. Please contact Hotel Security for access during unscheduled times. Must show ID/Badge to be admitted after hours.

### **PHYSICIAN REGISTRATION FEE**

Registration covers the Scientific Program Sessions, Meeting Syllabus, Poster Sessions, Multimedia Sessions, Daily Continental Breakfast, Welcome Reception, Exhibitor/Poster Reception, Jazz Band Reception/Founders' Dinner Dance, Coffee Breaks, and Daily Drawings.

### **BADGES/WRISTBANDS**

Badges or wristbands must be worn. They are proof of registration and are required for admittance to all functions and social events.

### **REGISTER FOR THE EXHIBITORS DAILY DRAWING**

Registered physicians will receive a Raffle Ticket every day during the meeting to register with the exhibitors and grantors. Place your ticket in the raffle box for a chance to win. Drawings will take place on Thursday and Friday at the end of the second break and on Saturday at the end of the first break in the Exhibit Area.

### **CME ACCREDITATION**

The American Academy of Orthopaedic Surgeons designates this live activity for a maximum of 26.75 *AMA PRA Category 1 Credits*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

\*20.75 CME Credits for Scientific Program

\*3 CME Credits for Scientific Poster Sessions

\*3 CME Credits for Multimedia Education Sessions

*To ensure correct CME credit is awarded, please complete the form in the back of this program, indicating the Sessions you attended or go online to [www.eoa-assn.org](http://www.eoa-assn.org) to complete the EOA 2012 Annual Meeting CME Credit Records. CME Certificates will be awarded to all registered participants.*

### **MANAGEMENT**

The Eastern Orthopaedic Association is managed by Data Trace Management Services, a Data Trace Company, Towson, Maryland.

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*The meeting function areas, including the registration area and meeting rooms, are designated non-smoking throughout the course of the meeting. Smoking is limited to areas where not prohibited by fire department regulations.*

***Please be considerate and silence your cell phones during the Scientific Program.***

## 2012 President

*43<sup>rd</sup> Annual Meeting  
Bolton Landing, New York*

**Henry A. Backe Jr., MD**

*Fairfield, Connecticut*

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### *EOA Past Presidents*

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1969-1970	Howard H. Steel, MD, PhD	1990-1991	Edward E. Kimbrough III, MD*
1970-1971	Howard H. Steel, MD, PhD	1991-1992	George P. Bogumill, MD, PhD
1971-1972	Warner D. Bundens Jr., MD*	1992-1993	Glen A. Barden, MD
1972-1973	R. Joe Burleson, MD*	1993-1994	Henry R. Cowell, MD, PhD
1973-1974	Joseph O. Romness, MD	1994-1995	Ronald C. Hillegass, MD
1974-1975	James D. Fisher, MD*	1995-1996	Stephen F. Gunther, MD
1975-1976	Marvin E. Steinberg, MD	1996-1997	L. Andrew Koman, MD
1976-1977	Leslie C. Meyer, MD	1997-1998	Chitranjan S. Ranawat, MD
1977-1978	Robert N. Richards Sr., MD	1998-1999	Charles H. Classen Jr., MD
1978-1979	Hugo A. Keim, MD	1999-2000	A. Lee Osterman, MD
1979-1980	Wallace E. Miller, MD*	2000-2001	James A. Nunley II, MD
1980-1981	James R. Urbaniak, MD	2001-2002	E. Anthony Rankin, MD
1981-1982	Stanley W. Lipinski, MD	2002-2003	Shepard R. Hurwitz, MD
1982-1983	William T. Green Jr., MD	2003-2004	John D. Lubahn, MD
1983-1984	Emmett M. Lunceford Jr., MD*	2004-2005	Thomas P. Vail, MD
1984-1985	John F. Mosher, MD	2005-2006	J. Richard Bowen, MD
1985-1986	B. David Grant, MD	2006-2007	Scott D. Boden, MD
1986-1987	Harry R. Gossling, MD*	2007-2008	Robert V. Dawe, MD
1987-1988	Andrew G. Hudacek, MD	2008-2009	Judith F. Baumhauer, MD, MPH
1988-1989	Lamar L. Fleming, MD	2009-2010	Robert N. Richards Jr., MD
1989-1990	Thomas S. Renshaw, MD	2010-2011	John C. Richmond, MD

\* Deceased

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## *2012 Howard Steel Lecture*

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**Daniel S. Pelino**  
*IBM Corporation*

EOA is pleased to have Daniel S. Pelino presenting the 2012 Howard Steel Lecture. He is General Manager of IBM's Global Healthcare and Life Sciences Business. Mr. Pelino works closely with public and private healthcare providers and payers, biotech and pharmaceutical companies, and medical device and instrument companies worldwide to create smarter, better-connected healthcare systems. He is a recognized expert in healthcare IT and has helped countries and states transform and digitize their healthcare systems.

Mr. Pelino is a frequent contributor to the healthcare dialogue, having appeared on numerous programs including ABC Nightly News, CNN, and BBC and has been quoted in various publications such as the Wall Street Journal, USA Today, New York Times, Washington Post, and a number of global publications. He has moderated many healthcare panels, hosted numerous webinars and maintains blogs on related healthcare topics.

He serves on the Executive Committee for the Patient Centered Primary Care Collaborative (PCPCC) and on the Board of Directors of the Healthcare Executive Network (HEN). Mr. Pelino is an inaugural member of the IBM Industry Academy representing the Healthcare and Life Sciences Industries.

Since joining IBM in 1980, Mr. Pelino has served in a number of leadership positions, including Vice President of Corporate Marketing and Strategy; Vice President of Global Distribution Channels Management; Vice President of the Americas, Central Region, responsible for customer relationships, revenue, profit, and market share for 15 Midwestern states; and Group Vice President of Global Sales, Marketing, and Support for the Technology Group.

Mr. Pelino received a BS in Business Administration and Public Relations and a master's degree in Organizational and Behavioral Studies from Western Kentucky University.



**Christine M. Kretz**  
*IBM Corporation*

Joining Mr. Pelino is Christine M. Kretz, who became part of the IBM Watson team as Program Director for Healthcare shortly after it was announced as a new division in IBM. She works directly with clients to determine needs and discuss cases for Watson and "Ready for Watson" analytics. In her current role, she collaborates with the Marketing, Sales and Product Management team to support healthcare clients and produce information for use within the healthcare industry for IBM Watson.

Joining IBM in 1998 as a manager in the Research Division, Christine had IT responsibilities including Y2K readiness and IT security for eight labs globally. From Research, Christine took a corporate position and was named the Global Operations Manager for IBM Life Sciences, an emerging business area for IBM. Christine has also held the positions of Healthcare Solutions Executive on the IBM Global Healthcare Industry team, and roles as a Client Executive and Complex Opportunity Manager in Healthcare / Life Sciences.

Christine holds a BFA from Carnegie Mellon University and an MBA in Operations from Katz Graduate School of Business, University of Pittsburgh. She lives in Yorktown, NY with her husband and two daughters and is a Girl Scout leader and coordinator for IBM Family Science Saturday program.

Please join us for this exciting and interesting presentation demonstrating the powers and applications of Watson.

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## 2011 - 2012 EOA Leadership

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### *Officers and Board of Directors*

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*PRESIDENT***Henry A. Backe Jr., MD***FIRST VICE PRESIDENT***David S. Zelouf, MD***SECOND VICE PRESIDENT***David W. Romness, MD***IMMEDIATE PAST PRESIDENT***John C. Richmond, MD***SECRETARY***James T. Guille, MD***TREASURER***Geoffrey H. Westrich, MD***HISTORIAN***Robert P. Boran Jr., MD***MEMBER AT LARGE (ONE YEAR)***Javad Parvizi, MD, FRCS***MEMBER AT LARGE (TWO YEARS)***Michael P. Bolognesi, MD***MEMBER AT LARGE (THREE YEARS)***Marc J. Levine, MD***MEMBERSHIP CHAIR***Brian J. Galinat, MD***PROGRAM CHAIR***John D. Kelly IV, MD***MANAGING DIRECTOR***E. Anthony Rankin, MD***BOC REPRESENTATIVE***John C. Richmond, MD**


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### *2011 - 2012 EOA Committees*

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***EOA Spouse Committee***

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Mrs. Henry A. Backe Jr. (Tara), *Chair*  
Mrs. Scott D. Boden (Mary)  
Mrs. Michael P. Bolognesi (Kelly)  
Mrs. Robert P. Boran Jr. (Kitsy)  
Mrs. Robert V. Dawe (Jean)  
Mrs. Brian J. Galinat (Lois)  
Mrs. John D. Kelly IV (Marie)  
Mrs. Mark J. Lemos (Marla)  
Mrs. Marc J. Levine (Robin)  
Mrs. Javad Parvizi (Fariba)

Mrs. E. Anthony Rankin (Frances)  
Mrs. Amar S. Ranawat (Andrea)  
Mrs. Chitranjan S. Ranawat (Gudie)  
Mrs. Robert N. Richards Jr. (Cindy)  
Mrs. John C. Richmond (Chris)  
Mrs. David W. Romness (Karen)  
Mrs. Geoffrey H. Westrich (Ellen)  
Mrs. Richard M. Wilk (Susan)  
Mrs. David S. Zelouf (Susan)

## Eastern Orthopaedic Educational Foundation



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***EOEF Officers***

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Chitranjan S. Ranawat, MD, *President*  
Robert V. Dawe, MD, *Secretary*  
Charles H. Classen Jr., MD *Treasurer*  
Glen A. Barden, MD, *ex-officio*

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***EOA Board of Incorporators***

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Howard H. Steel, MD, PhD  
Warner D. Bundens Jr., MD  
Henry R. Cowell, MD, PhD  
B. David Grant, MD  
Marvin E. Steinberg, MD  
Theodore R. Lammot, III, MD  
Edward J. Resnick, MD

George J. Schonholtz, MD  
Joseph O. Romness, MD  
Marcel J. Schulmann, MD  
Frederick J. Knocke, MD  
Arthur F. Seifer, MD  
Stephan A. Christides, MD

In witness whereof, we have made, subscribed, and acknowledged these  
Articles of Incorporation on the 25<sup>th</sup> day of May, 1970.



*Eastern Orthopaedic Education Foundation*

THANK YOU FOR YOUR SUPPORT!

**Egregia Cum Laude — \$100,000 and above**

Dr. Chitranjan S. Ranawat

**Summa Cum Laude — \$20,000 and above**

Dr. and Mrs. Glen A. Barden

Dr. Scott D. Boden

Dr. and Mrs. Shepard R. Hurwitz

**Maxima Cum Laude — \$10,000 and above**

Dr. and Mrs. J. Richard Bowen

Dr. and Mrs. David W. Romness

Dr. Geoffrey H. Westrich

**Magna Cum Laude — \$5,000 and above**

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Dr. David S. Zelouf

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Association  
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Dr. Paul H. Wierzbieniec  
Winthrop University  
Dr. Gary Zartman  
Dr. Eric Zitzman

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**2012 EOA New Members**


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We are pleased to welcome the following new Active members to the Eastern Orthopaedic Association:

**J. David Abraham, MD**  
Latham, NY

**Pouya Alijanipour, MD**  
Marbella, SPAIN

**William V. Arnold, MD**  
Jenkintown, PA

**Jahangir Asghar, MD**  
Coral Gables, FL

**Orin K. Atlas, MD**  
Hainesport, NJ

**Christopher Baker, MD**  
Stoneham, MA

**James Barber, MD**  
Douglas, GA

**Michael A. Baskies, MD**  
Basking Ridge, NJ

**Benjamin B. Bedford, MD**  
New York, NY

**Thomas Capotosta, MD**  
Mercerville, NJ

**David J. Cicerchia, MD**  
East Greenwich, RI

**Avnish N. Clerk, MD**  
Portsmouth, NH

**Salvatore Corso, MD**  
Dix Hills, NY

**John Crompton, MD**  
Hurricane, WV

**John F. Dalton, MD**  
Atlanta, GA

**Charles Davis II, MD**  
Glen Burnie, MD

**Donald Driscoll, MD**  
Concord, MA

**Dirk Dugan, MD**  
Ithaca, NY

**Alfred A. Durham, MD**  
Roanoke, VA

**Lawrence Fein, MD**  
Saratoga Springs, NY

**Curtis Goltz, MD**  
Camp Hill, PA

**William Gomez, MD**  
Mercerville, NJ

**Neil Green, MD**  
Fort Washington, MD

**Aron Green, MD**  
Ocean, NJ

**Susan Harding, MD**  
Philadelphia, PA

**Gregor M. Hawk, MD**  
Allentown, PA

**Karl Haywood, PA-C**  
Holyoke, MA

**Paul P. Hospodar, MD**  
Glenmont, NY

**Brian Jolley, MD**  
Burlington, MA

**Mara Karamitopoulos, MD**  
Brooklyn, NY

**Richard Katz, MD**  
Voorheesville, NY

**Wayne Kerness, MD**  
Norwood, NJ

**Charles Kime, MD**  
Farmington, CT

**J. Todd Lawrence, MD**  
Philadelphia, PA

**William Leone Jr., MD**  
Lighthouse Point, FL

**Michael Leslie, DO**  
New Haven, CT

**Stephen J. Lowe, MD**  
Yardley, PA

**Jeffrey Lutton, MD**  
Chambersburg, PA

**Daniel Markowicz, MD**  
Staten Island, NY

**Zeferino Martinez, MD**  
Bloomsburg, PA

**Michael Meese, MD**  
Hackensack, NJ

**Daniel E. Muser, MD**  
Laurys Station, PA

**Denis P. O'Brien, MD**  
Silver Spring, MD

**Wade Penny III, MD**  
Keene, NH

**Jeffrey Phillips, MD**  
Fort Washington, MD

**Ravi Ponnappan, MD**  
Marmora, NJ

**Ari E. Pressman, MD**  
Belle Vernon, PA

**Greg D. Riebel, MD**  
Salem, VA

**Richard Ritter, MD**  
East Patchogue, NY

**John A. Saugy, MD**  
Bethpage, NY

**Aaron K. Schachter, MD**  
Milford, CT

**Ernest L. Sink, MD**  
New York, NY

**Joseph Slappey, MD**  
Macon, GA

**Eric Smith, MD**  
Media, PA

**Neal Stansbury, MD**  
Allentown, PA

**Christopher Svogun, PA-C**  
Wallingford, CT

**Walter K. Urs, MD**  
Edison, NJ

**Anna Voytek, MD**  
Greensboro, NC

**Raymond M. Wolfe, MD**  
Chester, PA

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### *Membership by State*

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Alabama	1	New Jersey	79
Arizona	1	New York	116
California	1	North Carolina	36
Connecticut	37	Ontario	4
Delaware	10	Pennsylvania	141
District of Columbia	3	Puerto Rico	2
Florida	40	Rhode Island	8
Georgia	29	South Carolina	14
Germany	1	Spain	1
Italy	1	Sweden	1
Louisiana	2	Switzerland	2
Maine	9	Tennessee	1
Maryland	48	United Kingdom	4
Massachusetts	58	Vermont	1
Mexico	1	Virginia	29
Michigan	1	West Virginia	4
Minnesota	1	<b>TOTAL</b>	<b>693</b>
New Hampshire	6		

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### *Membership by Classification*

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Active		531
Allied Health		2
Candidate		3
Emeritus		157
<b>TOTAL</b>		<b>693</b>

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**Grantor/Exhibitor Acknowledgements**

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The Eastern Orthopaedic Association is grateful for the support of its educational grantors and exhibitors.  
Thank you for your participation and commitment to the EOA.

**Gold**

Arthrex, Inc. — *Grantor*  
Auxilium Pharmaceuticals, Inc.  
ConvaTec  
Medtronic Advanced Energy, LLC  
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3M Health Care  
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Ortho-Preferred  
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Wright Medical Technology, Inc.

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## *Grantor/Exhibitor Information*

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### **3M Health Care**

19 Malcolm Road  
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**“Innovative solutions — from a trusted supplier — for better health”** We're a global leader offering innovative products and solutions for medical, oral care, health information management, drug delivery and food safety. We leverage 3M technology, world-class manufacturing and global reach to provide trusted products that help promote health and improve the quality, cost and outcomes of care. We offer the broadest array of solutions in the fight against hospital-acquired infections. Our products are backed by a diverse portfolio of educational programs and knowledgeable technical service to provide practical support for your patients and staff.

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888-627-9957  
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Since 1988, Acumed has focused its efforts on solving complicated fractures of the upper and lower extremities. Our products reflect commitment to innovation, quality, and customer service.

### **Angiotech**

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800-523-3332  
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The Quill™ device is a knotless tissue closure device indicated for soft tissue approximation. The unique barb design within the Quill™ device allows for distribution of tension across the entire length of the wound or tissue being approximated, and eliminates the need for an interrupted suture technique or knot-tying.

### **AllMeds**

151 Lafayette Drive, Suite 401  
Oak Ridge, TN 37830  
888-343-6337  
www.allmeds.com

AllMeds' Specialty EHR and practice management solutions bring Orthopaedic groups tools that provide true MEANINGFUL USE capabilities, priming practices for FEDERAL EHR INCENTIVES.

### **Arthrex, Inc.**

1370 Creekside Blvd.  
Naples, FL 34108  
800-933-7001  
www.arthrex.com

Contributing over 30 years of service to the industry, Arthrex continues to lead the way in product technology, innovation and education to meet and exceed the needs of the orthopaedic surgeons worldwide.

### **Auxilium Pharmaceuticals, Inc.**

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Malvern, PA 19355  
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www.xiaflex.com

Auxilium Pharmaceuticals, Inc. is a specialty biopharmaceutical company committed to providing innovative solutions for unmet medical needs which are often undiagnosed or under-treated.

### **BBL Medical Facilities, Inc.**

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Albany, NY 12203  
888-450-4225  
www.bblmedicalfacilities.com

BBL Medical Facilities, a single-source organization, specializes in planning, designing, and building medical buildings. BBL can also provide real estate, financing, development, and property management services.

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San Diego, CA 92130  
858-436-1400  
www.cadencepharm.com

Cadence Pharmaceuticals is a biopharmaceutical company focused on in-licensing, developing and commercializing

proprietary product candidates principally for use in the hospital setting.

**Captive Radiology**

6273 Frank Avenue, NW  
North Canton, OH 44720  
330-966-0500  
www.captiveradiology.com

Shared-Risk, Turn-key Partnerships: Captive Radiology (CR) forges turn-key partnerships with physician groups around high-end diagnostic imaging services; typically through off-balance sheet, risk-sharing financial models. Collectively, we have developed 100+ such projects! Practices are often looking for creative means to expand and improve their practices, increase market share and create new revenue streams. CR is the trusted partner that has the expertise to develop such services AND we are willing to share in the financial risk to ensure our solutions are successful. Captive Radiology can tailor a solution for you given the distinct make-up of your practice while focusing on delivering quality of care to your patients and driving your bottom line results. We have the experience and track record to do so!

**Carticept Medical, Inc.**

6120 Windward Parkway, Suite 220  
Alpharetta, GA 30005  
770-754-3800  
www.carticept.com

Carticept Medical Inc., a private medical device company, markets proprietary advanced injection delivery technology and portable ultrasound equipment (manufactured by SonoSite – the world leader in point-of-care ultrasound) to improve the quality of life for orthopedic patients.

**CeramTec Medical Products**

CeramTec-Platz 1-9  
D-73207 Plochingen  
Germany  
901-672-7569  
www.ceramtec.com

CeramTec is the world’s leading manufacturer of ceramic products for use in hip arthroplasty. It has been at the forefront in the development of innovative ceramic products that offer the highest reliability with the lowest articulation wear for Total Hip Replacement. Technological advances such as the introduction of our Alumina Matrix Composite (BioloX® delta) will further increase the reliability of our products. Every 45 seconds a BioloX® component is surgically implanted around the world.

**ConforMIS, Inc.**

11 North Avenue  
Burlington, MA 01803  
781-345-9001  
www.conformis.com

ConforMIS develops and commercializes medical devices for the treatment of osteoarthritis and joint damage. The company’s patented “image-to-implant” technology enables the creation of patient-specific implants and instruments that are precisely sized and shaped to match the 3D topography of a patient’s anatomy. To date, ConforMIS has developed a line of award winning personalized knee solutions to address all stages of osteoarthritis.

**ConvaTec**

100 Headquarters Park Drive  
Skillman, NJ 08558  
800-422-8811  
www.convatec.com

ConvaTec develops and markets innovative medical technologies that help improve the lives of millions of people in Ostomy Care, Wound Therapeutics, Continence and Critical Care, and Infusion Devices.

**CuraMedix, Inc.**

701 George Washington Highway, Suite 308  
Lincoln, RI 02865  
401-333-65000  
www.curamedix.com

Extracorporeal Pulse Activation Technology (EPAT®) is a breakthrough treatment involving the delivery of a unique set of proprietary acoustic pressure waves to the affected areas of the body which promotes healing without surgery for acute & chronic musculoskeletal disorders. Fast, Safe, Effective, and Affordable!

**DePuy Orthopaedics Inc.**

PO Box 988  
Warsaw, IN 46581  
800-473-3789  
www.depuy.com

DePuy Orthopaedics Inc., a Johnson and Johnson Company, is the world’s oldest and largest orthopaedic company and is a leading designer, manufacturer, and distributor of orthopaedic devices and supplies.

**DePuy Mitek, Inc.**

325 Paramount Drive  
Raynham, MA 02767  
800-382-4682  
www.depuymitek.com

DePuy Mitek, Inc. is a leading developer and manufacturer of a full line of innovative orthopedic sports medicine and soft-

tissue repair products, including devices and the non-surgical treatment ORTHOVISC<sup>®</sup> for knee arthritis. The company offers minimally invasive and arthroscopic solutions that address the challenges of soft tissue repair in the rotator and ACL and is developing new biologic, regenerative product solutions.

#### **DeRoyal**

200 DeBusk Lane  
Powell, TN 37849  
888-938-7828  
www.deroyal.com

DeRoyal is a global supplier of over 25,000 medical products and services with 2300 employees worldwide. Its five divisional business units, Acute Care, Patient Care, Trauma, Wound Care, and OEM, are headquartered in Powell, Tennessee, with 25 manufacturing facilities and offices in five U.S. states and in six other countries.

#### **DJO Global**

1430 Decision Street  
Vista, CA 92081  
760-727-1280  
www.djoglobal.com

DJO provides solutions for musculoskeletal and vascular health, and pain management. Products help prevent injuries or rehabilitate after surgery, injury or degenerative disease.

#### **EOS Imaging, Inc.**

185 Alewife Brook Parkway, #410  
Cambridge, MA 02138  
678-564-5400  
www.eos-imaging.com

Born from a technology awarded by the Nobel Prize for Physics, the EOS<sup>®</sup> system is the first imaging solution designed to capture simultaneous bilateral long length images, full body or localized, of patients in a weight bearing position, providing a complete picture of the patient's skeleton at very low dose exposure. EOS enables global assessment of balance and posture as well as a 3D bone-envelope image in a weight-bearing position, and provides automatically over 100 clinical parameters to the orthopedic surgeon for pre- and post-operative surgical planning.

#### **Exactech, Inc.**

2320 NW 66th Court  
Gainesville, FL 32653  
352-377-1140  
www.exac.com

Based in Gainesville, Fla., Exactech develops and markets orthopaedic implant devices, related surgical instruments and biologic materials and services to hospitals and physicians.

#### **Ferring Pharmaceuticals Inc.**

4 Gatehall Drive, Third Floor  
Parsippany, NJ 07054  
973-796-1600  
www.euflexxa.com

Ferring Pharmaceuticals Inc. is a research based biopharmaceutical company that offers treatments for patients with osteoarthritis(OA) of the knee. Euflexxa is a highly purified hyaluronan, also called Hyaluronic Acid (HA). It is the first bioengineered HA approved in the US for the treatment of OA knee pain.

#### **Hologic, Inc.**

35 Crosby Drive  
Bedford, MA 01730  
781-999-7667  
www.hologic.com

Hologic is introducing the next generation of mini C-arm systems, the **Fluoroscans InSightFD** with flat detector technology featuring an exclusive rotating detector and collimator. This new thin profile design improves surgical area positioning and the new image processing algorithms and automated adjustments deliver superb image quality with minimal dose. For more information, visit [www.fluoroscans.com](http://www.fluoroscans.com).

#### **Innova Surgical**

800 Village Walk #199  
Guilford, CT 06437  
888-424-7170  
www.innovasurgical.com

InnovaSurgical provides top-quality orthopedic products and equipment to both patients and physicians. But more than a provider, InnovaSurgical is a resource, opening the lines of communication between medical professionals, and manufacturers to aid in the development of new and better technologies.

#### **Knee Creations, LLC**

900 Airport Road, Suite 3B  
West Chester, PA 19380  
484-887-8900  
www.subchondroplasty.com

Subchondroplasty<sup>™</sup> is a minimally invasive surgery designed to treat subchondral defects associated with chronic bone marrow edema (BME) by filling them with a hard-setting, bone void filler

#### **MAKO Surgical Corp.**

2555 Davie Road  
Ft. Lauderdale, FL 33317  
954-927-2044  
www.makosurgical.com

MAKO Surgical Corp.<sup>®</sup> is proud to support surgeons' efforts to restore patient mobility and lifestyle by offering MAKO-

plasty<sup>®</sup>. MAKOplasty<sup>®</sup> is empowered by robotic arm technology to bring a new level of precision and confidence to total hip and partial knee surgery. For a hands-on demonstration, please stop by our booth.

**McKesson**

1145 Sanctuary Parkway, Suite 200  
 Alpharetta, GA 30009  
 904-556-1096  
[www.mckessonpracticesolutions.com](http://www.mckessonpracticesolutions.com)

McKesson is dedicated to strengthening the vitality of physician practices, by bringing certified EHR and practice management solutions to over 125,000 practices nationwide. McKesson's solutions include Practice Partner<sup>®</sup>, Medisoft<sup>®</sup> Clinical, Lytec<sup>®</sup> MD, Horizon Practice Plus<sup>™</sup> and the latest web-based EHR, McKesson Practice Choice<sup>™</sup>. Additionally, with Bright Note Technology<sup>™</sup>, our solutions complement your workflow and enhance care quality.

**Medical Protective**

5814 Reed Road  
 Fort Wayne, IN 46835  
 800-463-3776 (800-4MEDPRO)  
[www.medpro.com](http://www.medpro.com)

Medical Protective, a Warren Buffett Berkshire Hathaway Company, protects the reputation and assets of healthcare providers with four levels of unmatched protection — strength, defense, solutions, since 1899.

**Medtronic Advanced Energy, LLC**

180 International Drive  
 Portsmouth, NH 03801  
 603-842-6219  
[www.medtronic.com](http://www.medtronic.com)

Medtronic Advanced Energy develops and manufactures advanced energy devices that deliver proprietary TRANSCOLLATION<sup>®</sup> technology, a combination of radiofrequency (RF) energy and saline, to provide haemostatic sealing of soft tissue and bone. The company's AQUAMANTYS<sup>®</sup> System was designed to reduce blood loss in a broad range of orthopaedic procedures.

**NuTech Medical**

2641 Rocky Ridge Lane  
 Birmingham, AL 35216  
 800-824-9194  
[www.NuTechMedical.com](http://www.NuTechMedical.com)

Nutech Medical, a biological company, distributes conventional and machined allograft. NuCel is a proprietary adult cellular product derived from Amnion. NuTech also developed and markets the NuFix facet fusion system and the spinous process interspinous fusion system, SPIF. NuShield, derived from amnion, is a natural anti-scarring barrier.

**O.R. Specialties, Inc. / Adirondack Medical**

168 Irving Avenue, Suite 203B  
 Port Chester, NY 10573  
 914-939-9355 / 518-885-5391  
[www.or-specialties.com](http://www.or-specialties.com)

Distributors of ConMedLinVatec products serving the North Eastern United States for 25 years.

**Ortho-Preferred**

110 West Road, Suite 227  
 Towson, MD 21204  
 877-304-3565  
[www.Ortho-Preferred.com](http://www.Ortho-Preferred.com)

Take advantage of the next evolution in professional liability insurance with the Ortho-Preferred Program. When you choose the Ortho-Preferred Program you not only receive comprehensive professional liability insurance coverage at competitive rates through Medical Protective, but also additional benefits above and beyond your coverage through DT Preferred Group, LLC, a risk purchasing group. Choose the Ortho-Preferred Program and find out how much you could save on your professional liability insurance today!

**ProScan Reading Services**

5400 Kennedy Avenue  
 Cincinnati, OH 45213  
 877-PROSCAN  
[www.proscan.com](http://www.proscan.com)

ProScan Reading Services — Tele-radiology for your Practice: Our team of board-certified, fellowship-trained (MSK MRI) radiologists support the launch and growth of your imaging division. ProScan Reading Services is committed to improving the quality of care through education, access, expertise and technology. ProScan Teleradiology— Everything you need, we deliver!

**Sanofi Biosurgery**

10 Revers Run  
 Mechanicville, NY 12118  
 518-669-4238  
[www.genzyme.com](http://www.genzyme.com)

Sanofi Biosurgery develops and markets innovative, biologically based products for health conditions that are often difficult to manage. One of these products, Synvisc-One<sup>®</sup> (hylan G-F 20), is a non-systemic therapy for OA of the knee that provides up to 6 months of pain relief with just one simple injection.

**SI-Bone, Inc.**

3055 Olin Avenue, Suite 2200  
San Jose, CA 95128  
408-207-0700  
www.si-bone.com

SI-BONE, Inc. is the leading sacroiliac (SI) joint medical device company dedicated to the development of tools for diagnosing and treating patients with low back issues related to SI joint disorders. The company is manufacturing and marketing a minimally invasive surgical (MIS) technique for the treatment of SI joint pathology.

**Smith & Nephew, Inc.**

7135 Goodlett Farms Parkway  
Cordova, TN 38016  
901-396-2121  
www.smith-nephew.com

Smith & Nephew, Inc. is a global provider of leading-edge joint replacement systems for knees and hips, trauma products to help repair broken bones and other medical devices to help alleviate pain in joints and promote healing.

**SRSsoft**

155 Chestnut Ridge Road  
Montvale, NJ 07645  
201-802-1300  
www.srssoft.com

SRS is the recognized leader in productivity-enhancing EHR technology for orthopaedic practices, with an unparalleled adoption rate. The SRS EHR, SRS Care Tracker PM, and SRS PACS enhance patient care and increase revenue. Prominent orthopaedic groups overwhelmingly choose SRS because of its unique fit with the demands of their specialty.

**Stryker Orthopaedics**

325 Corporate Drive  
Mahwah, NJ 07430  
800-447-7836  
www.stryker.com

Stryker Orthopaedics is a global leader in the development of orthopaedic technology that helps to improve the quality of life of patients around the world.

**Synthes**

1302 Wrights Lane East  
West Chester, PA 19380  
800-523-0322  
www.synthes.com

Synthes is a leading global medical device company. We develop, produce and market instruments, implants and biomaterials for the surgical fixation, correction and regeneration of the skeleton and its soft tissues.

**Wright Medical Technology, Inc.**

5677 Airline Road  
Arlington, TN 38002  
800-238-7188  
www.wmt.com

Wright Medical Technology is a global manufacturer and distributor of reconstructive joint devices and bio-orthopaedic materials. We provide a wide variety of knee, extremity and biologic products for our customers. With over 50 years in business, Wright Medical provides a trusted name in orthopaedics.

**Zimmer, Inc.**

PO Box 708  
Warsaw, IN 46581  
574-267-6131  
www.zimmer.com

Zimmer is a world leader in musculoskeletal health. We're creators of innovative and personalized joint replacement technologies. Founded in 1927, we remain true to our purpose of restoring mobility, alleviating pain, and helping millions of people around the world find renewed vitality. Zimmer has operations in more than 25 countries around the world, sells products in more than 100 countries and is supported by the efforts of more than 8,000 employees

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## EOA Business Meetings

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### Eastern Orthopaedic Association

The Sagamore  
Bolton Landing, New York  
Bellvue Room

Thursday, June 21, 2012  
7:00am–7:15am

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### First Business Meeting Agenda

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- I. Reading of the Minutes of the previous meeting  
by the Secretary (and their approval) ..... James T. Guille, MD
- II. Report of the President ..... Henry A. Backe Jr., MD
- III. Report of the Immediate Past President ..... John C. Richmond, MD
- IV. Report of the First Vice President ..... David S. Zelouf, MD
- V. Report of the Second Vice President ..... David W. Romness, MD
- VI. Report of the Treasurer ..... Geoffrey H. Westrich, MD
- VII. Report of the Historian ..... Robert P. Boran, MD
- VIII. Report of the Program/Professional Education Committee ..... John D. Kelly IV, MD
- IX. Report of the Membership Committee ..... Brian J. Galinat, MD
- X. Report of the Managing Director ..... E. Anthony Rankin, MD
- XI. Report of Member at Large (1 yr) ..... Javad Parvizi, MD, FRCS
- XII. Report of Member at Large (2 yr) ..... Michael P. Bolognesi, MD
- XIII. Report of Member at Large (3 yr) ..... Marc J. Levine, MD
- XIV. Report of the Bylaws Committee ..... Mark J. Lemos, MD
- XV. Report of the Technical Exhibit Committee ..... Amar S. Ranawat, MD
- XVI. Report of Finance Committee ..... Geoffrey H. Westrich, MD
- XVII. Report of Audit Committee ..... David S. Zelouf, MD
- XVIII. Report of Nominating Committee/Presentation of Slate ..... John C. Richmond, MD  
2012-2013 Nominating Committee:  
Douglas P. Hien, MD  
Riyaz H. Jinnah, MD  
James J. Purtill, MD  
James C. Vailas, MD
- XIX. New Business  
(a) Nominations from the Floor for the Nominating Committee  
Nominating Committee Requirements:  
The Nominating Committee shall consist of five (5) Active Members of the Association, three (3) of whom shall be elected at the Annual Meeting of the Association, following nominations from the floor, the fourth member shall be appointed by the President and may not be a previous officer of the Association. The fifth member, who shall act as the

Chair, shall be the immediate available Past President, or, in the event of his/her inability to serve shall be appointed by the President with the approval of the Board of Directors.

With the exception of the Immediate Past President, the members of the Committee shall not be concurrently officers of the Association. No member shall serve for two (2) consecutive years on the Nominating Committee.

XX. Announcement

XXI. Adjournment

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## 2011 Eastern Orthopaedic Association Annual First Business Meeting Minutes

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Williamsburg, Virginia  
Thursday, October 20, 2011

The meeting was called to order at 7:00am by President, John C. Richmond, MD. He determined that a quorum was present to appropriately conduct the business of the Association.

**Report of the Secretary, James T. Guille, MD:** The minutes from the previous First Business Meeting from Naples, 2010, were approved as submitted in the Meeting Syllabus.

**Report of the President, John C. Richmond, MD:** Dr. Richmond welcomed everyone to Williamsburg for the 42<sup>nd</sup> annual EOA meeting. He reported on the educational aspects of the meeting and commended Dr. Westrich and the Program Committee for putting together an excellent meeting.

**Report of the Immediate Past President, Richard N. Richards Jr., MD:** He stated that it had been an honor to serve as President and thanked everyone for their support during his year as President.

**Report of the 1st Vice President, Henry A. Backe Jr., MD:** Dr. Backe reported that he looks forward to the 43rd annual meeting to be held June 20-23, 2012, at The Sagamore on Lake George in Bolton Landing, NY. Dr. John Kelly will be the Program Chair.

**Report of the 2nd Vice President, David S. Zelouf, MD:** Dr. Zelouf reported that the 44th annual meeting will be October 30-November 2, 2013 at the Loews Miami Beach. Dr. Jay Parvizi will serve as the Program Chair. He encouraged everyone to attend the meeting.

**Report of the Treasurer, David Romness, MD:** Dr. Romness reported that as a result of strong meeting attendance, exhibitor revenue, and improvement in our portfolio, the EOA is in good financial condition.

**Report of the Historian, Robert P. Boran, MD:** Dr. Boran held a moment of silence for deceased members.

**Report of the Program Chair, Geoffrey H. Westrich, MD:** Dr. Westrich reported that the program consisted of approximately 130 abstract presentations, 52 posters and 5 symposia.

**Report of the Membership Committee, James C. Vailas, MD:** Dr. Vailas reported that as of the meeting there were 104 new members and 652 active members. He encouraged the new members to attend the new member reception. Dr. Richmond presented Dr. Vailas with a beautiful walnut box for his service on the Board.

**Report of the Managing Director, E. Anthony Rankin, MD:** Dr. Rankin thanked the Board for their stewardship of the Association.

**Report of the Member at Large (1 yr), Mark J. Lemos, MD:** No report

**Report of the Member at Large (2 yr), Javad Parvizi, MD:** Dr. Parvizi encouraged the Academic institutions to support the meeting through submission of research and attendance at the meeting.

**Report of the Member at Large (3 yr), Michael P. Bolognesi, MD:** Dr. Bolognesi reported on the status of the Sate Reps and encouraged anyone interested in serving to let him know.

**Report of the Bylaws Committee, David S. Zelouf, MD:** No bylaws changes, no report.

**Report of the Technical Exhibit Committee, Amar S. Ranawat, MD:** Dr. Ranawat reported that at this meeting there are 43 exhibitors. He encouraged all to visit and thank the exhibitors for supporting our meeting.

**Report of the Finance Committee, David W. Romness, MD:** Dr. Romness reported EOA had an extremely positive year financially. The EOA investment portfolio has bounced back from last year. He also reported that our investment strategy remains conservative at this time.

**Report of the Audit Committee, Henry A. Backe Jr., MD:**

Dr. Backe reported that the Audit had been completed. He indicated that a member needs to be elected to the Audit Committee. Dr. James C. Vailas was nominated to serve a two year term. A vote will be taken at the Second Business Meeting on Saturday.

**Report of the Nominating Committee/Presentation of Slate, Robert N. Richards Jr., MD, Chairman:**

Dr. Richards presented the slate of officers to the membership. These include:

President:	Henry A. Backe Jr., MD
First Vice President:	David S. Zelouf, MD
Second Vice President:	David W. Romness, MD
Secretary:	James T. Guille, MD
Treasurer:	Geoffrey H. Westrich, MD
Member at Large:	Marc J. Levine, MD
Historian:	Robert P. Boran, MD

The slate of officers will be voted on at the Second Business Meeting on Saturday.

**New Business:** Nominations from the floor for the 2012 Nominating Committee were opened. The nominations were:

1. Riyaz H. Jinnah, MD
2. Douglas P. Hein, MD
3. James Purtil, MD

Nominations were then closed and will be voted on during the Second Business Meeting on Saturday.

There being no further new business. Dr. Richmond adjourned the meeting at 7:10am.

Respectfully submitted,  
James T. Guille, MD  
Secretary, EOA

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## Eastern Orthopaedic Association

The Sagamore  
Bolton Landing, New York  
Bellvue Room

Saturday, June 23, 2012  
7:00am–7:20am

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### Second Business Meeting Agenda

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#### ELECTIONS

- I. Reading of the Minutes of the previous meeting  
by the Secretary (and their approval) . . . . . James T. Guille, MD
- II. Report of Telecommunications Committee . . . . . Richard M. Wilk, MD
- III. Report on CME Accreditation . . . . . Robert N. Richards Jr., MD
- IV. Report of Newsletter Editor . . . . . Scott D. Boden, MD
- V. Report of Jazz Band Coordinator . . . . . Robert N. Richards Jr., MD
- VI. Report of the EOEF . . . . . Chitranjan S. Ranawat, MD
- VII. Unfinished Business
- VIII. New Business
  - (a) Election of Nominating Committee
- IX. Election of the Slate of Nominees
- X. Installation of First Vice President as President
- XI. Adjourn

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## 2011 Eastern Orthopaedic Association Second Business Meeting Minutes

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Williamsburg, Virginia  
Saturday, October 22, 2011

The meeting was called to order at 7:00am by President, John C. Richmond, MD. He determined that a quorum was present to appropriately conduct the business of the Association.

**Reading of the Secretary, James T. Guille, MD:** The minutes from the previous Second Business Meeting from Naples, 2010, were approved as submitted in the Meeting Syllabus.

**Report of the Telecommunications Committee, Marc J. Levine, MD:** No report.

**Report of the CME Committee, E. Anthony Rankin, MD:** No report.

**Report of the Newsletter Editor, Scott D. Boden, MD:** No report.

**Report of the Jazz Band Coordinator, Robert N. Richards, MD:** Dr. Richards reported that the Jazz Band will be playing at the 2011 meeting and will be led by Dr. Richards Sr.

**Report of the EOE, Chitranjan S. Ranawat, MD:** Dr. Ranawat gave a brief update and encouraged everyone to donate to the EOE.

**Audit Committee Election:** Dr. James C. Vailas was nominated at the First Business Meeting to serve as the Elected member of the Audit Committee for a term of two years.

**Action Item:** It was moved and seconded to approve the nomination of Dr. James C. Vailas to the Audit Committee. The motion carried.

**2012 Proposed Nominating Committee:** Dr. Richmond presented the previously nominated candidates for the 2012 Nominating Committee. The candidates include: Dr. Riyaz H. Jinnah, Dr. Douglas P. Hein and Dr. James Purtill. Those present voted for the three EOA members nominated to serve on the Nominating Committee.

**Action Item:** It was moved and seconded that the 2012 Nominating Committee be approved as presented. The motion carried.

**Report of the Nominating Committee/Presentation of Slate, John C. Richmond, MD, President:** Dr. Richmond presented the slate of officers to the membership for approval:

President:	Henry A. Backe Jr., MD
First Vice President:	David S. Zelouf, MD
Second Vice President:	David W. Romness, MD
Secretary:	James T. Guille, MD
Treasurer:	Geoffrey H. Westrich, MD
Member at Large:	Marc J. Levine, MD
Historian:	Robert P. Boran, MD

**Action Item:** It was moved and seconded that the 2012 Slate of Officers be approved as presented. The motion carried.

**New Business:** Dr. John C. Richmond performed the installation ceremony for the incoming president, Dr. Henry A. Backe. He presented him with the EOA Medallion. Dr. Backe then acknowledged Dr. Richmond for his outstanding leadership during the past year and for his outstanding meeting. He was then presented with the EOA Presidential Pin for his service.

There being no further new business, Dr. Richmond adjourned the meeting at 7:10am.

Respectfully submitted,  
James T. Guille, MD  
Secretary, EOA

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***Past Annual Meetings of the  
Eastern Orthopaedic Association 1970–2011***

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**First Annual Meeting**

President: Howard H. Steel, MD, PhD  
 Dates: November 18-21, 1970  
 Location: Seaview Country Club  
 Absecon, New Jersey  
 Attendance: 169 physicians / 107 spouses  
 Guest Speaker: Mr. John Wells Sharrard, FRCS  
*Sheffield, England*

**Second Annual Meeting**

President: Howard H. Steel, MD, PhD  
 Dates: October 23-26, 1971  
 Location: The Greenbrier  
 White Sulphur Springs, West Virginia  
 Attendance: 244 physicians / 141 spouses  
 Guest Speaker: Mr. J.S. Batchelor, FRCS  
*London, England*

**Third Annual Meeting**

President: Warner D. Bundens Jr., MD  
 Dates: October 18-22, 1972  
 Location: Cerromar Beach Hotel  
 Dorado Beach, Puerto Rico  
 Attendance: 280 physicians / 230 spouses  
 Guest Speaker: Professor J.I.P. James, FRCS  
*Edinburgh, Scotland*

**Fourth Annual Meeting**

President: R. Joe Burleson, MD  
 Dates: October 18-21, 1973  
 Location: The Greenbrier  
 White Sulphur Springs, West Virginia  
 Attendance: 270 physicians / 197 spouses  
 Guest Speaker: Professor Joseph Trueta, FRCS  
*Barcelona, Spain*

**Fifth Annual Meeting**

President: Joseph O. Romness, MD  
 Dates: October 16-20, 1974  
 Location: The Southampton Princess Hotel  
 Southampton, Bermuda  
 Attendance: 389 physicians / 298 spouses  
 Guest Speaker: Professor Sir John Charnley, FRCS  
*Manchester, England*

**Sixth Annual Meeting**

President: James D. Fisher, MD  
 Dates: October 15-19, 1975  
 Location: Cerromar Beach Hotel  
 Dorado Beach, Puerto Rico  
 Attendance: 319 physicians / 283 spouses  
 Guest Speaker: Professor Pier Giorgio Marchetti  
*Pisa, Italy*

**Seventh Annual Meeting**

President: Marvin E. Steinberg, MD  
 Dates: October 13-17, 1976  
 Location: The Breakers  
 Palm Beach, Florida  
 Attendance: 345 physicians / 271 spouses  
 Guest Speaker: Professor Alf L. Nachemson, MD  
*Gothenburg, Sweden*

**Eighth Annual Meeting**

President: Leslie C. Meyer, MD  
 Dates: October 12-16, 1977  
 Location: The Southampton Princess Hotel  
 Southampton, Bermuda  
 Attendance: 456 physicians / 366 spouses  
 Guest Speaker: Maurice E. Muller, MD  
*Berne, Switzerland*

**Ninth Annual Meeting**

President: Robert N. Richards Sr., MD  
 Dates: October 18-22, 1978  
 Location: Acapulco Princess Hotel  
 Acapulco, Mexico  
 Attendance: 392 physicians / 350 spouses  
 Guest Speaker: Ian Macnab, MB, FRCS  
*Toronto, Ontario, Canada*

**Tenth Anniversary Meeting**

President: Hugo A. Keim, MD  
 Dates: October 17-21, 1979  
 Location: The Breakers  
 Palm Beach, Florida  
 Attendance: 395 physicians / 334 spouses  
 Guest Speaker: Jack Stevens, MS  
*Newcastle Upon Tyne, England*

### Eleventh Annual Meeting

President: Wallace E. Miller, MD  
Dates: October 15-19, 1980  
Location: Cerromar Beach Hotel  
Dorado Beach, Puerto Rico  
Attendance: 354 physicians / 309 spouses  
Guest Speaker: John C. Kennedy, MD, FRCS  
*London, Ontario, Canada*

### Twelfth Annual Meeting

President: James R. Urbaniak, MD  
Dates: October 14-18, 1981  
Location: The Boca Raton Hotel  
Boca Raton, Florida  
Attendance: 365 physicians / 299 spouses  
Guest Speaker: Professor Heinz Wagner, MD  
*Nurnberg, Germany*

### Thirteenth Annual Meeting

President: Stanley W. Lipinski, MD  
Dates: October 13-17, 1982  
Location: The Southampton Princess Hotel  
Southampton, Bermuda  
Attendance: 458 physicians / 437 spouses  
Guest Speaker: Michael A.R. Freeman, MD, FRCS  
*London, England*

### Fourteenth Annual Meeting

President: William T. Green Jr., MD  
Dates: October 12-16, 1983  
Location: The Breakers  
Palm Beach, Florida  
Attendance: 316 physicians / 246 spouses  
Guest Speaker: Eduardo R. Luque, MD  
*Mexico City, Mexico*

### Fifteenth Annual Meeting

President: Emmett M. Lunceford Jr., MD  
Dates: October 10-14, 1984  
Location: The Acapulco Princess Hotel  
Acapulco, Mexico  
Attendance: 288 physicians / 248 spouses  
Guest Speaker: Sir Dennis Paterson, MD, FRCS  
*North Adelaide, South Australia*

### Sixteenth Annual Meeting

President: John F. Mosher, MD  
Dates: October 16-20, 1985  
Location: The Boca Raton Hotel  
Boca Raton, Florida  
Attendance: 290 physicians / 203 spouses  
Guest Speaker: Thomas P. Ruedi, MD, FACS  
*Basel, Switzerland*

### Seventeenth Annual Meeting

President: B. David Grant, MD  
Dates: October 15-19, 1986  
Location: The Southampton Princess Hotel  
Southampton, Bermuda  
Attendance: 389 physicians / 353 spouses  
Guest Speaker: Richard J. Hawkins, MD  
*London, Ontario, Canada*

### Eighteenth Annual Meeting

President: Harry R. Gossling, MD  
Dates: October 14-18, 1987  
Location: The Homestead Hotel  
Hot Springs, Virginia  
Attendance: 227 physicians / 221 spouses  
Guest Speaker: George Bentley, ChM, FRCS  
*Stanmore, England*

### Nineteenth Annual Meeting

President: Andrew G. Hudacek, MD  
Dates: October 12-16, 1988  
Location: The Cerromar Beach Hotel  
Dorado, Puerto Rico  
Attendance: 321 physicians / 264 spouses  
Guest Speaker: Marvin Tile, MD  
*Toronto, Ontario, Canada*

### Twentieth Anniversary Meeting

President: Lamar L. Fleming, MD  
Dates: October 11-15, 1989  
Location: The Queen Elizabeth Hotel  
Montreal, Quebec, Canada  
Attendance: 300 physicians / 239 spouses  
Guest Speakers: William C. Hutton, DSc  
*Atlanta, Georgia*  
Peter J. Fowler, MD  
*London, Ontario, Canada*

### Twenty-first Annual Meeting

President: Thomas S. Renshaw, MD  
Dates: October 17-21, 1990  
Location: The Southampton Princess Hotel  
Southampton, Bermuda  
Attendance: 356 physicians / 324 spouses  
Guest Speaker: Mercer Rang, MB, FRCS(c)  
*Toronto, Ontario, Canada*

### Twenty-second Annual Meeting

President: Edward E. Kimbrough III, MD  
Dates: October 16-21, 1991  
Location: Melia Castilla Hotel  
Madrid, Spain  
Attendance: 300 physicians / 239 spouses

Guest Speakers: Augusto Sarmiento, MD  
*Los Angeles, California*  
Mr. R. Lew Bennett

### Twenty-third Annual Meeting

President: George P. Bogumill, MD, PhD  
Dates: October 14-18, 1992  
Location: Hyatt Regency Cerromar Beach Hotel  
Dorado, Puerto Rico  
Attendance: 429 physicians / 285 spouses  
Guest Speaker: Murray K. Dalinka, MD  
*Philadelphia, Pennsylvania*

### Twenty-fourth Annual Meeting

President: Glen A. Barden, MD  
Dates: October 13-17, 1993  
Location: Disney's Grand Floridian Beach Resort  
Lake Buena Vista, Florida  
Attendance: 379 physicians / 299 spouses  
Guest Speaker: Cecil H. Rorabeck, MD  
*London, Ontario, Canada*

### Twenty-fifth Annual Meeting

President: Henry R. Cowell, MD, PhD  
Dates: October 12-16, 1994  
Location: The Southampton Princess Hotel  
Southampton, Bermuda  
Attendance: 339 physicians / 280 spouses  
Guest Speakers: Mr. John W. Goodfellow  
*London, England*  
Robert B. Salter, MD  
*Toronto, Ontario, Canada*

### Twenty-sixth Annual Meeting

President: Ronald C. Hillegass, MD  
Dates: October 11-15, 1995  
Location: Sheraton Roma Hotel  
Rome, Italy  
Attendance: 430 physicians / 259 spouses  
Guest Speaker: Robert D. D'Ambrosia, MD  
*New Orleans, Louisiana*

### Twenty-seventh Annual Meeting

President: Stephen F. Gunther, MD  
Dates: October 16-20, 1996  
Location: Hyatt Regency Hilton Head  
Hilton Head Island, South Carolina  
Attendance: 239 physicians / 164 spouses  
Guest Speakers: George Cierny III, MD  
*Atlanta, Georgia*  
Michael J. Patzakis, MD  
*Los Angeles, California*

### Twenty-eighth Annual Meeting

President: L. Andrew Koman, MD  
Dates: October 14-19, 1997  
Location: Scottsdale Princess  
Scottsdale, Arizona  
Attendance: 219 physicians / 164 spouses  
Guest Speaker: Russell F. Warren, MD  
*New York, New York*

### Twenty-ninth Annual Meeting

President: Chitranjan S. Ranawat, MD  
Dates: October 14-18, 1998  
Location: Ritz Carlton Hotel  
Isla Verde, Puerto Rico  
Attendance: 268 physicians / 142 spouses  
Guest Speakers: Lawrence D. Dorr, MD  
*Los Angeles, California*  
Bernard F. Morrey, MD  
*Rochester, Minnesota*

### Thirtieth Anniversary Meeting

President: Charles H. Classen Jr., MD  
Dates: October 13-17, 1999  
Location: Vienna Hilton Hotel  
Vienna, Austria  
Attendance: 272 physicians / 207 spouses  
Guest Speaker: Henry H. Bohlman, MD  
*Cleveland, Ohio*

### Thirty-first Annual Meeting

President: A. Lee Osterman, MD  
Dates: October 11-15, 2000  
Location: Disney's Grand Floridian Resort and Spa  
Lake Buena Vista, Florida  
Attendance: 179 physicians / 89 spouses  
Guest Speakers: James D. Heckman, MD  
*Needham, Massachusetts*  
Peter J. Stern, MD  
*Cincinnati, Ohio*

### Thirty-second Annual Meeting

President: James A. Nunley II, MD  
Dates: October 10-14, 2001  
Location: Fairmont Southampton Princess Hotel  
Southampton, Bermuda  
Attendance: 153 physicians / 110 spouses  
Guest Speakers: Leroy Walker, PhD  
*Durham, North Carolina*  
Michael B. Wood, MD  
*Rochester, Minnesota*

### Thirty-third Annual Meeting

President: E. Anthony Rankin, MD  
Dates: October 16-20, 2002  
Location: Ritz Carlton Hotel  
Amelia Island, Florida  
Attendance: 230 physicians / 89 spouses  
Guest Speakers: Professor David C. Driskell  
*Baltimore, Maryland*  
Alvin H. Crawford, MD  
*Cincinnati, Ohio*

### Thirty-fourth Annual Meeting

President: Shepard R. Hurwitz, MD  
Dates: July 30-August 3, 2003  
Location: The Burlington Hotel  
Dublin, Ireland  
Attendance: 231 physicians / 142 spouses  
(In conjunction with SOA)  
Guest Speakers: Melvin Rosenwasser, MD  
*New York, New York*  
Pete Gillen  
*Charlottesville, Virginia*

### Thirty-fifth Annual Meeting

President: John D. Lubahn, MD  
Dates: October 13-17, 2004  
Location: The Westin Rio Mar Beach  
San Juan, Puerto Rico  
Attendance: 191 physicians / 152 spouses  
Guest Speaker: Terry Light, MD  
*Chicago, Illinois*

### Thirty-sixth Annual Meeting

President: Thomas P. Vail, MD  
Dates: October 5-8, 2005  
Location: Hyatt Regency Chesapeake Bay  
Cambridge, Maryland  
Attendance: 198 physicians / 86 spouses  
Guest Speaker: Ian D. Learmonth, MB, ChB, FRCS  
*Bristol, England*

### Thirty-seventh Annual Meeting

President: J. Richard Bowen, MD  
Dates: October 18-21, 2006  
Location: Boca Raton Resort and Club  
Boca Raton, Florida  
Attendance: 232 physicians / 63 spouses  
Guest Speaker: G. Dean MacEwen, MD  
*Newark, DE*

### Thirty-eighth Annual Meeting

President: Scott D. Boden, MD  
Dates: August 1-4, 2007  
Location: The Fairmont Empress Hotel  
Victoria, BC, Canada  
Attendance: 252 physicians / 103 spouses  
(In conjunction with SOA)  
Guest Speaker: Frederick S. Kaplan, MD  
*Pittsburgh, Pennsylvania*

### Thirty-ninth Annual Meeting

President: Robert V. Dawe, MD  
Dates: October 22-25, 2008  
Location: The Ritz-Carlton  
Lake Las Vegas, Nevada  
Attendance: 160 physicians/55 spouses  
Guest Speaker: Chitranjan S. Ranawat, MD  
*New York, New York*

### Fortieth Annual Meeting

President: Judith F. Baumhauer, MD, MPH  
Dates: June 17-20, 2009  
Location: Atlantis Resort  
Paradise Island, Bahamas  
Attendance: 287 physicians / 121 spouses  
Guest Speaker: James N. Weinstein, MS, DO  
*Hanover, New Hampshire*

### Forty-first Annual Meeting

President: Robert N. Richards Jr., MD  
Dates: October 14-16, 2010  
Location: The Ritz-Carlton  
Naples, Florida  
Attendance: 300 physicians / 98 spouses  
Guest Speaker: Richard D. Lakshman, MD  
*Philadelphia, Pennsylvania*

### Forty-second Annual Meeting

President: John C. Richmond, MD  
Dates: October 19-22, 2011  
Location: The Kingsmill  
Williamsburg, Virginia  
Attendance: 312 physicians / 81 spouses  
Guest Speaker: Brian Day, MD  
*Vancouver, British Columbia, Canada*



## Eastern Orthopaedic Association

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# Scientific Program

June 21-23, 2012

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The Sagamore  
Bolton Landing, New York

*Please be considerate and silence your cell phone during the Scientific Program.*



## 2012 Program Chair



**John D. Kelly IV, MD**  
*Philadelphia, Pennsylvania*

John D. Kelly IV is an associate professor of Orthopedic Surgery at the University of Pennsylvania. Dr. Kelly specializes in Sports Medicine and Shoulder surgery.

He has a passion for education and research and has won numerous teaching awards in his 21 years of practice.

His research interests include diabetes and shoulder stiffness, hyperglycemia and impaired healing, ‘minimally intrusive’ ACL reconstruction, and ‘holistic’ orthopaedics.

Dr. Kelly hails from Wilmington, Delaware and has been living in Philadelphia since 1984. He is happily married to Marie Sakosky — Kelly and Marie are about to celebrate their 25<sup>th</sup> anniversary. The Kellys have twin daughters — Mary Elizabeth and Ann Marie.

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## *EOA Honorary Members*

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Theodore R. Lammot III, MD	Incorporator
Mr. John Wells Sharrard, FRCS	Guest Speaker 1970
Professor J. I. P. James, FRCS	Guest Speaker 1972
Professor Pier Giorgio Marchetti	Guest Speaker 1975
Professor Alf L. Nachemson, MD	Guest Speaker 1976
Maurice E. Muller, MD	Guest Speaker 1977
Professor Heinz Wagner	Guest Speaker 1981
Mr. Michael A. R. Freeman, MD, FRCS	Guest Speaker 1982
Eduardo R. Luque, MD	Guest Speaker 1983
Sir Dennis Paterson, MD, FRCS	Guest Speaker 1984
Thomas P. Ruedi, MD, FACS	Guest Speaker 1985
Richard J. Hawkins, MD	Guest Speaker 1986
Mr. George Bentley, ChM, FRCS	Guest Speaker 1987
Marvin Tile, MD	Guest Speaker 1988
William C. Hutton, DSc	Guest Speaker 1989
Peter J. Fowler, MD	Guest Speaker 1989
Mercer Rang, MB, FRCS (C)	Guest Speaker 1990
Augusto Sarmiento, MD	Guest Speaker 1991
Mr. R. Lew Bennett	Guest Speaker 1991
Murray K. Dalinka, MD	Guest Speaker 1992
Cecil H. Rorabeck, MD	Guest Speaker 1993
Mr. John W. Goodfellow	Guest Speaker 1994
Robert B. Salter, MD	Guest Speaker 1994
Robert D. D'Ambrosia, MD	Guest Speaker 1995
Michael J. Patzakis, MD	Guest Speaker 1996
George Cierny III, MD	Guest Speaker 1996
Elizabeth Capella	Former Executive Director
Russell F. Warren, MD	Guest Speaker 1997
Lawrence D. Dorr, MD	Guest Speaker 1998
Bernard F. Morrey, MD	Guest Speaker 1998
Henry H. Bohlman, MD	Guest Speaker 1999
James D. Heckman, MD	Guest Speaker 2000
Peter J. Stern, MD	Guest Speaker 2000
Leroy Walker, PhD	Guest Speaker 2001
Michael B. Wood, MD	Guest Speaker 2001
Professor David C. Driskell	Guest Speaker 2002
Alvin H. Crawford, MD	Guest Speaker 2002
Melvin Rosenwasser, MD	Guest Speaker 2003
Pete Gillen	Guest Speaker 2003
Terry Light, MD	Guest Speaker 2004
Ian D. Learmonth, MB, ChB, FRCS	Guest Speaker 2005
G. Dean MacEwen, MD	Guest Speaker 2006
Fredrick S. Kaplan, MD	Guest Speaker 2007
Chitranjan S. Ranawat, MD	Guest Speaker 2008
James N. Weinstein, MS, DO	Guest Speaker 2009
Richard D. Lackman, MD	Guest Speaker 2010
Brian Day, MD	Guest Speaker 2011

## 2012 Presidential Guest Speaker



**Derek J. W. McMinn, MD, FRCS**  
*Birmingham, United Kingdom*

It is a great pleasure for EOA to have Derek McMinn as the 2012 Presidential Guest Speaker. For the past 27 years, Mr. Derek McMinn has been involved in research aimed at improving the quality of life of patients with arthritis. Having graduated from St. Thomas Medical School in London in 1977, he moved to Birmingham and then onto several leading arthroplasty centers for specialist training in primary and revision surgery. Returning to Birmingham, he developed a large arthroplasty practice and introduced many original implants. In earlier years he performed more knee replacements than hips, but as the challenge of developing a successful hip resurfacing made ever-increasing demands on his time and expertise, knee arthroplasty work had to take a back seat.

A few of the many contributions of Mr. McMinn to arthroplasty include the McMinn Resurfacing in 1991, the Birmingham Hip Resurfacing (BHR) in 1997, the Birmingham Mid-Head Resection (BMHR) device in 2003, and the Birmingham Knee Replacement in 2007. Alongside the development of these various implants, he finessed the surgical techniques for their safe implantation and the necessary instrumentation. He has personally performed over 3,500 hip resurfacings and has trained surgeons from around the world.

Mr. McMinn was the Presidential Guest Lecturer at the Hip Society Open meeting at the 75<sup>th</sup> Anniversary of the AAOS in San Francisco, the Sir John Charnley Lecturer at the British Orthopaedic Association and the Sir Robert Jones Lecturer at NYU, New York in 2008. He has addressed the Select Committee of the British House of Commons, has published extensively in leading journals and authored books on hip arthroplasty. His book, *Modern Hip Resurfacing*, which has received critical acclaim from several quarters, includes a textbook and an operative technique video.

After establishing hip resurfacing as a successful treatment option, Mr. McMinn resumed his work on knees. His Birmingham Knee Replacement incorporates several well-researched conceptual changes, which promise to add a new dimension in restoring knee function and patient satisfaction following knee replacement.

Mr. McMinn continues to lead a team of engineers and medical researchers in his quest to find better solutions for hip and knee arthritis in the young and active. He set up the McMinn Centre as a continuing platform for disseminating education and research. In recognition of his sterling work, the University of Birmingham awarded Mr. McMinn the degree of Doctor of Medicine (MD) Honoris Causa. EOA is honored to have Mr. McMinn as the Presidential Guest Speaker for its 43<sup>rd</sup> Annual Meeting.

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## *2012 EOA Resident/Fellow Award Recipients*

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### **Founders' Award Winner**

*Paul Kiely, MCh, FRCS (Tr&Orth), Hospital for Special Surgery, New York, NY*

New Formulation of Demineralized Bone Matrix Putty Performs Substantially Equivalent to Iliac Bone Graft in Rabbit Posterolateral Lumbar Spine Arthrodesis

Friday, June 22, 8:31am–8:37am

### **Ranawat Award Winner**

*Noah Chinitz, MD, Northshore Long Island Jewish Medical Center Feinstein Institute for Medical Research, Manhasset, NY*

Novel Strategy to Enhance Microfracture Surgery: Use of SDF-1 and Sphingosine in Isolated Cartilaginous Defects

Friday, June 22, 8:38am–8:44am

### **Resident/Fellow Award Winners**

*Pouya Alijanipour, MD, The Rothman Institute, Philadelphia, PA*

Optimal ESR and CRP Cut-Off Values Based on New Criteria for Definition of Periprosthetic Joint Infection

Thursday, June 21, 8:05am–8:11am

*Kaan S. Irgit, MD, Geisinger Medical Center, Danville, PA*

Treatment of Pertrochanteric Fractures (AO/OTA 31-A1 and A2): Long Versus Short Cephalomedullary Nailing

Saturday, June 23, 7:34am–7:40am

*Daniel G. Kang, MD, Walter Reed National Military Medical Center, Bethesda, MD*

Pedicle Screw “Hubbing” in the Adult and Immature Thoracic Spine: A Biomechanical and Micro-Computed Tomography Evaluation

Saturday, June 23, 12:40pm–12:46pm

### **Resident/Fellow Travel Grant Winners**

*Vinay K. Aggarwal, BS, The Rothman Institute, Philadelphia, PA*

Patients with Atrial Fibrillation Undergoing Total Joint Arthroplasty (TJA) Increase Hospital Burden

Thursday, June 21, 7:46am–7:52am

*Abdo Bachoura, MD, University of Kentucky, Lexington, KY*

Three Dimensional Morphometric Analysis of the Anterior Elbow Capsule

Saturday, June 23, 12:18pm–12:24pm

*Hooman Bakhshi, The Rothman Institute, Philadelphia, PA*

Organism Profile in Periprosthetic Joint Infection (PJI): Do Infecting Pathogens Differ in Europe Versus the United States?

Friday, June 22, 9:36am–9:42am

*Adam Bevevino, MD, Walter Reed National Military Medical Center, Bethesda, MD*

Incidence and Morbidity of Concomitant Spine Fractures in Combat Related Amputees

Saturday, June 23, 12:11pm–12:17pm

*Kirk A. Campbell, MD, New York University Hospital for Joint Diseases, New York, NY*

Incidence and Risk Factors for Hospital-Acquired Clostridium Difficile Infection in Orthopaedic Surgery Patients

Friday, June 22, 9:15am–9:21am

*Michael Faloon, MD, Hospital for Special Surgery, New York, NY*

Comparison of Long Term (5 YR) Reoperation Rates and Outcomes for Long Fusions to the Sacrum for Adult Deformity: Primary Vs. Revision Surgery

Saturday, June 23, 12:47pm–12:53pm

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*Xinning Li, MD, University of Massachusetts Medical Center, Worcester, MA*

Functional Outcome After Total Shoulder Arthroplasty in the Obese Patient Population. A Prospective Study with Greater Than 2 Years of Follow Up

Friday, June 22, 9:04am–9:10am

*Morteza Meftah, MD, Hospital for Special Surgery, New York, NY*

Long-Term Results of Cryosurgery for Treatment of Low-Grade Chondrosarcoma

Friday, June 22, 9:22am–9:28am

*Addisu Mesfin, MD, Washington University, St. Louis, MO*

Does Preoperative Narcotic Use Persist After Spinal Deformity Surgery? A Comparison of Non-Narcotic and Narcotic Using Groups

Saturday, June 23, 12:54pm–1:00pm

*Benjamin Zmistowski, BS, The Rothman Institute, Philadelphia, PA*

Periprosthetic Joint Infection: A Fatal Condition?

Thursday, June 21, 7:18am–7:24am

## *Financial Disclosure Information*

Eastern Orthopaedic Association has identified the option to disclose as follows.

The following participants have disclosed whether they or a member of their immediate family:

1. Receive royalties for any pharmaceutical, biomaterial, or orthopaedic product or device;
2. Within the past twelve months, served on a speakers' bureau or have been paid an honorarium to present by any pharmaceutical, biomaterial, or orthopaedic product or device company;
- 3a. Paid Employee for any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier;
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5. Receive research or institutional support as a principal investigator from any pharmaceutical, biomaterial, orthopaedic device and equipment company, or supplier;
6. Receive any other financial/material support from any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier;
7. Receive any royalties, financial/material support from any medical and/or orthopaedic publishers;
8. Serves on the editorial or governing board of any medical and/or orthopaedic publication;
9. Serves on any Board of Directors, as an owner, or officer, on a relevant committee of any health care organization (e.g., hospital, surgery center, medical);
- n. No conflicts to disclose.

The Academy does not view the existence of these disclosed interests or commitments as necessarily implying bias or decreasing the value of the author's participation in the meeting.

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Bahar Adeli, BA (n.)
Vinay K. Aggarwal, BS (n.)
Hye Sun Ahn, MS (n.)
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David B. Albert, MD (n.)
Pouya Alijanipour, MD (n.)
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David T. Anderson, MD (n.)
Cassandra M. Andreychik, BA (n.)
William V. Arnold, MD (3a. <i>Merck, URL Pharma</i> ; 4. <i>Merck, URL Pharma</i> ; 5. <i>Stryker</i> ; 8. <i>Journal of Arthroplasty</i> ; 9. <i>Rothman Surgical Institute</i> )

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Amy Austin, MD (n.)
Luke Austin, MD (5. <i>Zimmer, Tornier</i> )
Matthew S. Austin, MD (1. <i>Zimmer</i> ; 3b. <i>Zimmer, Biomet</i> ; 5. <i>DePuy</i> )
Jeremie Michael Axe, MD (6. <i>Smith &amp; Nephew</i> )
Michael James Axe, MD (3b. <i>Smith &amp; Nephew</i> )
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Abdo Bachoura, MD (n.)
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Hooman Bakhshi (n.)
Chaim Y. Bar-Eli, BA (n.)
Gus Barraqueta, BS (n.)
Joshua A. Baumfeld, MD (n.)
Anthony J. Bell, MD (4. <i>Orulus Innovative Sciences</i> )
Jayson P. Bell, MD (n.)
Heather Bennett, JD (8. <i>New York State Society of Orthopaedic Surgeons Newsletter</i> ; 9. <i>New York State Society of Orthopaedic Surgeons</i> )

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Adam Bevevino, MD (n.)
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Yossef C. Blum, MD (n.)
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Thomas R. Bowen, MD (8. Journal of Knee Surgery)
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## Accreditation Information for the Scientific Program

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### MISSION

The Eastern Orthopaedic Association (EOA) was established in 1970 under the leadership of Howard H. Steel, MD and 12 prominent orthopaedic surgeons. Its purpose is to promote, encourage, foster, and advance the highest quality and most cost effective practice of orthopaedic surgery and matters related thereto by providing an educational format for the free discussion and teaching of orthopaedic methods and principles among orthopaedic surgeons, both member and non-member; and to establish a forum for practicing orthopaedic surgeons to update their knowledge and awareness of new techniques, treatment methods, and devices available for patient care, teaching, and research by using the most appropriate educational methods.

### PURPOSE

1. To provide the participants with an objective, unbiased educational experience that will enable them to remain current in both the knowledge and practical elements of contemporary orthopaedic surgery;
2. To provide the participants with a detailed, in depth education of selected topics relative to the practice of orthopedic surgery;
3. Allow participants to assess potential deficiencies in their knowledge base as it pertains to the practice of orthopedic surgery; and
4. Present ample opportunities for participants to exchange ideas with the presenters, the faculty and other enrollees through paper presentations, instructional courses, guest lectureships, symposia, multimedia educational sessions and poster exhibits.

### OBJECTIVES

Educational objectives will be met through a combination of paper presentations, lectures and workshops in plenary, concurrent and specialty sessions with ample time afforded for open discussion. The following objectives will be addressed during the Scientific Program, such that at the conclusion of this course the attendees will be expected to:

1. Improve their diagnostic, treatment and technical skills in the management of orthopaedic afflictions by assimilation of scientific advances;
2. Discuss basic science paradigms as they relate to treatment advances;
3. Understand some of the basic principals in practice management; and
4. Critically assess emerging trends in orthopedic medicine and evaluate their evidence basis.

### SCIENTIFIC POSTER PRESENTATIONS

Scientific Posters are an important feature of the EOA Annual Meeting. Posters will be on display along with their presenters each day of the Scientific Program. Poster Presenters will also be available to answer questions before and after the Scientific Program on Thursday, Friday, and Saturday, June 21-23.

### MULTIMEDIA EDUCATION

Multimedia education materials will be offered on Thursday, Friday, and Saturday, June 21-23, at the designated times. A comprehensive selection of AAOS DVDs will be available for your individual education.

### CME ACCREDITATION

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint Sponsorship of the American Academy of Orthopaedic Surgeons and the Eastern Orthopaedic Association. 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 26.75 *AMA PRA Category 1 Credits*<sup>TM</sup>. Physicians should claim only the credit

commensurate with the extent of their participation in the activity.

- \* 20.75 CME credits for Scientific Program
- \* 3 CME credits for Poster Sessions
- \* 3 CME credits for Multimedia Sessions

***To ensure correct CME credit is awarded, please complete the form in the back of this program, indicating the Sessions you attended or go online to [www.eoa-assn.org](http://www.eoa-assn.org) to complete the EOA 2012 Annual Meeting CME Credit Records. CME Certificates will be awarded to all registered participants.***

## **CEC CREDIT**

Physician's Assistants can receive up to 26.75 credit hours toward Continuing Education Credits. AAPA accepts American Medical Association Category I, Level 1 CME credit for the Physician's Recognition Award from organizations accredited by the ACCME.

## **CME NOTE**

To receive CME credit, you are required to turn in your completed CME Record Form at the end of your participation in the Sessions; otherwise, your CME credit hours cannot be certified. **(CME Credit Record, Needs Assessment and Course Evaluation Forms can be found in the back of this program.)**

Attendees are requested to complete a course evaluation for use in developing future EOA Annual Meeting Scientific Programs and to meet the unique educational requirements of orthopaedic surgeons.

Program design is based on participants' responses from the last annual meeting and expressed educational goals of the EOA. This program is designed specifically for the educational needs of the practicing orthopaedist. Others in the medical profession (such as physician assistants) or with an interest in orthopaedics will benefit from the program.

## **DISCLAIMER**

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# 2012 Scientific Program

## Thursday, June 21, 2012

*(Presenters and times are subject to change.)*

Disclosure Information is listed on pages 44-50.

### General Session I — Case Reviews (*Bellvue Room*)

**Moderators:** Joshua A. Baumfeld, MD

6:00am–7:00am Case Presentations — Attendees invited to present cases

7:00am–7:15am **First Business Meeting**

7:15am–7:18am **Welcome to EOA's 43<sup>rd</sup> Annual Meeting**

*Henry A. Backe Jr., MD, President  
John D. Kelly IV, MD, Program Chair*

### Concurrent Symposia I — Cartilage (*Bellvue Room*)

**Moderators:** James L. Carey, MD  
Jack J. McPhilemy, DO

- 7:18am–7:28am Microfracture vs Oats: Which Way To Go?  
*Mark J. Lemos, MD, Lahey Clinic, Peabody, MA*
- 7:28am–7:43am ACI: The Gold Standard for Chondral Lesions and OCD  
*James L. Carey, MD, Penn Sports Medicine Center, Philadelphia, PA*
- 7:43am–7:53am Meniscal Repair: Indications and Fixators: My Favorites  
*Joshua A. Baumfeld, MD, Lahey Clinic, Peabody, MA*
- 7:53am–8:05am Meniscal Transplant: Indications and Technique  
*Brian J. Sennett, MD, University of Pennsylvania, Philadelphia, PA*
- 8:05am–8:17am Knee Osteotomy: A Lost Art?  
*John C. Richmond, MD, New England Baptist Hospital, Boston, MA*
- 8:17am–8:27am Hyaluronic Acid — Is It Worth It?  
*Fotios P. Tjoumakaris, MD, Rothman Institute Orthopaedics Jefferson Medical College, Egg Harbor Township, NJ*

### Concurrent Session II — Arthroplasty (*Triuna Room*)

**Moderators:** Geoffrey H. Westrich, MD  
David W. Romness, MD

- 7:18am–7:24am **Resident/Fellow Travel Grant Winner**  
Periprosthetic Joint Infection: A Fatal Condition?  
*Benjamin Zmistowski, BS, The Rothman Institute, Philadelphia, PA*
- 7:25am–7:31am Do Pulmonary Emboli Arise from Lower Extremity Deep Venous Thrombosis?  
*Raviinder Parmar, MD, The Rothman Institute, Philadelphia, PA*
- 7:32am–7:38am Risk Factors for Pulmonary Embolism Following TJA  
*Javad Parvizi, MD, FRCS, The Rothman Institute, Philadelphia, PA*
- 7:39am–7:45am The Effect of Laminar Air Flow and Door Openings on Contamination in the Operating Room  
*Eric B. Smith, MD, The Rothman Institute, Philadelphia, PA*
- 7:46am–7:52am **Resident/Fellow Travel Grant Winner**  
Patients with Atrial Fibrillation Undergoing Total Joint Arthroplasty (TJA) Increase Hospital Burden  
*Vinay K. Aggarwal, BS, The Rothman Institute, Philadelphia, PA*
- 7:52am–7:58am **Discussion**

## Thursday, June 21, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

- 8:27am–8:50am Discussion — Ask the Experts: Cases  
*James L. Carey, MD, Penn Sports Medicine Center, Philadelphia, PA*  
*Jack J. McPhilemy, DO, Philadelphia College of Osteopathic Medicine, Philadelphia, PA*
- 8:50am–9:10am **Break — Please visit with exhibitors**
- 7:58am–8:04am Charlson Comorbidity Index is Better than ASA Scores in an Orthopedic Patient Population  
*Bahar Adeli, BA, The Rothman Institute, Philadelphia, PA*
- 8:05am–8:11am **Resident/Fellow Award Winner**  
Optimal ESR and CRP Cut-Off Values Based on New Criteria for Definition of Periprosthetic Joint Infection  
*Pouya Alijanipour, MD, The Rothman Institute, Philadelphia, PA*
- 8:12am–8:18am Radiologic Evaluation of Acetabular Retroversion in Femoroacetabular Impingement: The Value of the Acetabular Retroversion Index  
*Claudio Diaz-Ledezma, MD, The Rothman Institute, Philadelphia, PA*
- 8:19am–8:25am Predictors of Hospital-Acquired Conditions After Elective Joint Arthroplasty  
*Carlos A. Higuera, MD, The Rothman Institute at Thomas Jefferson University Hospital, Philadelphia, PA*
- 8:26am–8:32am Post-Operative Use of a Wound Vac for Persistently Draining Wounds Following Hip Arthroplasty  
*Erik N. Hansen, MD, The Rothman Institute at Thomas Jefferson University Hospital, Philadelphia, PA*
- 8:33am–8:50am **Discussion**
- 8:40am–8:50am Special EOA Lecture Video ‘How I Balance TKA’  
*Chitranjan S. Ranawat, MD, Hospital for Special Surgery, New York, NY*
- 8:50am–9:10am **Break — Please visit with exhibitors**

\* Institution by abstract presenter’s name is the location where the research took place.

## Thursday, June 21, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

### Concurrent Session III — Sports Shoulder (Bellvue Room)

**Moderator:** G. Russell Huffman, MD

- 9:10am–9:16am Influence of Graft Source on Outcome after ACL Reconstruction  
*Kevin D. Plancher, MD, Orthopaedic Foundation for Active Lifestyles, Cos Cob, CT*
- 9:17am–9:23am Partial Articular-Sided Rotator Cuff Tears: A Comparative Study of In-Situ Repair vs Completion of Tear Prior to Repair  
*Arun Rajaram, MD, Yale University School of Medicine, New Haven, CT/New England Musculoskeletal Institute, University of Connecticut, Farmington, CT*
- 9:24am–9:30am Effect of Interference Screw Fixation on Anterior Cruciate Ligament Integrity and Tensile Strength  
*Gregory Sawyer, MD, Rhode Island Hospital, Providence, RI*  
*\*Presented by Melissa Christino, MD*
- 9:31am–9:37am Shoulder Range of Motion and Strength in Professional Ice Hockey Players  
*Randy M. Cohn, MD, NYU Hospital for Joint Diseases, New York, NY*
- 9:37am–9:41am **Discussion**
- 9:41am–9:47am Anterior Cruciate Ligament Reconstruction with Bone-Patellar Tendon-Bone Autograft Versus Allograft in Young Patients  
*Alfred Atanda, MD, The Rothman Institute, Philadelphia, PA*  
*\*Presented by Matthew J. Kraeutler, BS*
- 9:48am–9:54am Distal Locking Using an Electromagnetic Field Guided Computer Based Real Time System for Orthopaedic Trauma Patients  
*Maxwell K. Langfitt, MD, Wake Forest Baptist Medical Center, Winston-Salem, NC*  
*\*Presented by Riyaz H. Jinnah, MD*
- 9:55am–10:01am Comparison of Anterior Cruciate Ligament Reconstruction with Bone — Patellar Tendon-Bone Allograft Versus Soft Tissue Allograft in Patients Under Twenty-Five Years Old: A Matched Pair Analysis at a Minimum 2-Year Follow UP  
*Loukas Koyonos, MD, The Rothman Institute, Philadelphia, PA*

### Concurrent Session IV — Knee Arthroplasty (Triuna Room)

**Moderators:** Jack J. McPhilemy, DO  
Fotios P. Tjoumakaris, MD

- 9:10am–9:16am Total Joint Arthroplasty in Patients with Prior Cancer  
*Joseph A. Karam, MD, The Rothman Institute, Philadelphia, PA*
- 9:17am–9:23am The Effect of Preoperative Hemoglobin A1c on Acute Postoperative Complications Following Total Joint Arthroplasty  
*Daniel Goldstein, MD, Albert Einstein Medical Center, Philadelphia, PA*  
*\*Presented by Joel B. Durinka, MD*
- 9:24am–9:30am Efficacy of 2% Chlorhexidine Gluconate-Impregnated Wipes in Total Joint Arthroplasty  
*Nicholas J. Farber, BS, University of Pittsburgh, Pittsburgh, PA*
- 9:31am–9:37am Accelerometer-Based, Portable Navigation Versus Imageless, Large Console Computer Assisted Navigation in Total Knee Arthroplasty: A Comparison of Radiographic Results  
*Denis Nam, MD, Hospital for Special Surgery, New York, NY*  
*\*Presented by K. Durham Weeks, MD*
- 9:37am–9:46am **Discussion**
- 9:46am–9:52am Tibiofemoral Contact Mechanics Following Unicompartmental Knee Arthroplasty  
*Thomas J. Heyse, MD, Hospital for Special Surgery, New York, NY*
- 9:53am–9:59am Sonication of Antibiotic Spacers During Two-Stage Revision Joint Arthroplasty  
*Robert B. Jones, MD, Geisinger Health System, Danville, PA*
- 10:00am–10:06am Articular Surface Design Changes Affect Contact Patterns in Total Knee Arthroplasty  
*Adam Rana, MD, Hospital for Special Surgery, New York, NY*

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## Thursday, June 21, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

- 10:01am–10:05am **Discussion**
- 10:05am–10:15am Focus Video: Posterior Lateral Corner Reconstruction  
*Claude T. Moorman III, MD, Duke University Medical Center, Durham, NC*
- 10:15am–10:35am **Break — Please visit with exhibitors**

- 10:06am–10:15am **Discussion**
- 10:15am–10:35am **Break — Please visit with exhibitors**

### General Session V — Presidential Address & Howard Steel Lecture (Bellvue Room)

**Moderators:** Henry A. Backe Jr., MD  
David S. Zelouf, MD

- 10:35am–11:05am **Presidential Address**  
Evidence Based Medicine — Are We There Yet?  
*Henry A. Backe Jr., MD, Orthopaedic Specialty Group, Fairfield, CT*

- 11:05am–12:05pm **Howard Steel Lecture**  
*Daniel S. Pelino, IBM Corporation*  
*Christine M. Kretz, IBM Corporation*

- 12:05pm–1:00pm **Industry Workshop Luncheon — ConvaTec (CME credit not available)**

- 1:00pm–1:45pm **Industry Workshop — Cadence Pharmaceuticals Inc. (CME credit not available)**

### Concurrent Symposia II — Upper Extremity (Bellvue Room)

**Moderator:** David J. Bozentka, MD

- 1:45pm–1:55pm Tendon Transfers — The Nitty Gritty  
*David S. Zelouf, MD, The Philadelphia Hand Center, Philadelphia, PA*
- 1:55pm–2:05pm Carpal Instability: Where Are We Now?  
*David J. Bozentka, MD, Presbyterian Medical Center, Philadelphia, PA*
- 2:05pm–2:15pm Distal Radius Fractures: What I've Learned in 20 Years  
*David R. Steinberg, MD, Penn Orthopaedics, Philadelphia, PA*
- 2:15pm–2:25pm Current Concepts in the Treatment of Dupuytren's Disease: Is Less More?  
*Phillip E. Blazar, MD, The Brigham & Woman's Hospital, Boston, MA*
- 2:25pm–2:35pm Supracondylar Fracture Humerus in 2012  
*Joshua M. Abzug, MD, University of Maryland School of Medicine, Timonium, MD*

### Concurrent Symposia III — General/Trauma (Triuna Room)

**Moderator:** Saqib Rehman, MD

- 1:45pm–1:55pm My Approach to Ankle FX  
*Saqib Rehman, MD, Temple University, Philadelphia, PA*
- 1:55pm–2:05pm Open Tibia Fractures: Do We Need to Wash Out ASAP?  
*Samir Mehta, MD, Hospital of the University of Pennsylvania, Philadelphia, PA*
- 2:05pm–2:25pm Sports Trauma the West Point Experience  
*LTC Brett D. Owens, MD, Keller Army Hospital, West Point, NY*
- 2:25pm–2:35pm Discussion — Ask the Experts: Cases

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## Thursday, June 21, 2012

*(Presenters and times are subject to change.)*

Disclosure Information is listed on pages 44-50.

### Symposia IV — Bearing Surface Options in THA (Dollar Island)

**Moderators:** Javad Parvizi, MD, FRCS  
Michael P. Bolognesi, MD

- 2:35pm–2:55pm Evolution of Bearing Couples  
*Robert M. Streicher, MD, Freienbach, Switzerland*
- 2:55pm–3:10pm Femoral Modularity in Revision THR: Clinical Issues and Outcomes  
*Geoffrey H. Westrich, MD, Hospital for Special Surgery, New York, NY*
- 3:10pm–3:25pm Minimizing Complications after TJA  
*Gwo-Chin Lee, MD, University of Pennsylvania, Philadelphia, PA*
- 3:25pm–3:35pm **Discussion**

3:35pm–4:35pm Saw Bones Workshop

4:35pm–5:35pm **Scientific Poster Session** (Poster Presenters Available) (*Abenia and Evelley Rooms*)

4:35pm–5:35pm **Multimedia Session** (*Ballroom Foyer*)

\* Institution by abstract presenter's name is the location where the research took place.

## Friday, June 22, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

### General Session VI — Case Reviews (*Bellyue Room*)

**Moderator:** Richard M. Wilk, MD

6:00am–7:00am Case Presentations — Attendees invited to present cases

### Concurrent Symposia V — Hip Arthroscopy (*Triuna Room*)

**Moderator:** Richard M. Wilk, MD

- 7:00am–7:10am Hip Arthroscopy for Beginners  
*Richard M. Wilk, MD, Lahey Clinic, Burlington, MA*
- 7:10am–7:20am Pearls for the ‘Challenging Aspects’ (Capsule, Exposure, Scuffs, Etc.)  
*John P. Salvo, MD, Thomas Jefferson University Hospital at Rothman Institute, Philadelphia, PA*
- 7:20am–7:35am Cam Pincer Treatment Pearls  
*Bryan T. Kelly, MD, Hospital for Special Surgery, New York, NY*
- 7:35am–7:45am Peritrochanteric Space  
*John D. Kelly IV, MD, University of Pennsylvania, Philadelphia, PA*
- 7:45am–8:00am Case Reviews — Attendees invited to present cases
- 8:00am–8:20am **Break — Please visit with exhibitors**

### Concurrent Symposia VI — DVT Prophylaxis Across Specialties (*Bellyue Room*)

**Moderator:** Geoffrey H. Westrich, MD

- 7:00am–7:10am Trauma — My Preferences  
*Susan P. Harding, MD, Hahnemann Orthopaedics, Philadelphia, PA*
- 7:10am–7:20am Shoulder — Is It Overkill  
*David L. Glaser, MD, Presbyterian Hospital, Philadelphia, PA*
- 7:20am–7:30am THA TKA — Latest and Greatest  
*Norman A. Johanson, MD, Hahnemann Orthopaedics, Philadelphia, PA*
- 7:30am–7:45am Discussion — Ask the Experts: Cases
- 7:45am–8:00am Special Guest Lecture — State of Art Rx AVN Hip  
*Bernard N. Stulberg, MD, Cleveland Clinic, Cleveland, OH*
- 8:00am–8:20am **Break — Please visit with exhibitors**

### Concurrent Session VII — Sports Medicine/Shoulder (*Bellyue Room*)

**Moderator:** James C. Vailas, MD

- 8:20am–8:35am Guest Lecture: Conflict of Interest, Are We Going Too Far?  
*Carlos J. Lavernia, MD, Arthritis Surgery Research Foundation, Miami, FL*
- 8:36am–8:42am Predictors of Surgical Treatment in Humeral Shaft Fractures in the Poly-Trauma Patient  
*Fotios P. Tjoumakaris, MD, Rothman Institute Orthopaedics Jefferson Medical College, Egg Harbor Township, NJ*

### Concurrent Session VIII — General/Basic Science (*Triuna Room*)

**Moderator:** Edward R. McDevitt, MD

- 8:20am–8:30am Update on Soft Tissue Rx Lower Extremity Trauma  
*Susan P. Harding, MD, Hahnemann Orthopaedics, Philadelphia, PA*
- 8:31am–8:37am **Founders’ Award Winner**  
New Formulation of Demineralized Bone Matrix Putty Performs Substantially Equivalent to Iliac Bone Graft in Rabbit Posterolateral Lumbar Spine Arthrodesis  
*Paul Kiely, MCh, FRCS (Tr&Orth), Hospital for Special Surgery, New York, NY*

\* Institution by abstract presenter’s name is the location where the research took place.

## Friday, June 22, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

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|---------------|---|---------------|---|
| 8:43am–8:49am | Clinical Outcomes After Bilateral ACL Reconstruction<br><i>Steven B. Cohen, MD, The Rothman Institute, Philadelphia, PA</i>   | 8:38am–8:44am | <b>Ranawat Award Winner</b><br>Novel Strategy to Enhance Microfracture Surgery: Use of SDF-1 and Sphingosine in Isolated Cartilaginous Defects<br><i>Noah Chinitz, MD, Northshore Long Island Jewish Medical Center Feinstein Institute for Medical Research, Manhasset, NY</i> |
| 8:50am–8:56am | Humerus Fractures Treated at a Regional Trauma Center: A 6-Year Epidemiologic Study<br><i>Luke Austin, MD, Atlanticare, Atlantic City, NJ</i>   | 8:45am–8:51am | Antimicrobial Properties and Elution Kinetics of Linezolid from Polymethylmethacrylate: An In-Vitro Comparative Study<br><i>Nimrod Snir, MD, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel</i>   |
| 8:57am–9:03am | The Effect of Double Row Versus Single Row Rotator Cuff Repair on the Restoration of Shoulder Motion, Strength and Function: A Prospective Randomized Double-Blind Trial<br><i>Stephen J. Nicholas, MD, Nicholas Institute of Sports Medicine and Athletic Trauma Lenox Hill Hospital, New York, NY</i> | 8:52am–8:58am | Dilute Betadine Wash Reduces Hardware Related Bacterial Burden in a Rabbit Knee Infection Model<br><i>Mohit Giloira, MD, University of Maryland Orthopaedics, Baltimore, MD</i><br><i>*Presented by Thao P. Nguyen, MD</i>  |
| 9:04am–9:10am | <b>Resident/Fellow Travel Grant Winner</b><br>Functional Outcome After Total Shoulder Arthroplasty in the Obese Patient Population: A Prospective Study with Greater than 2 Years of Follow Up<br><i>Xinning Li, MD, Hospital for Special Surgery, New York, NY</i>                                     | 8:59am–9:05am | Surgical Repair of Gluteus Medius Tendon Tears of the Hip: Results and Technique<br><i>G. Dean Harter, MD, Geisinger Medical Center, Danville, PA</i>   |
| 9:10am–9:20am | <b>Discussion</b>   | 9:05am–9:15am | <b>Discussion</b>   |
| 9:20am–9:26am | Inter- and Intraobserver Reliability of Radiographic Diagnosis and Treatment of Acromioclavicular Joint Separations<br><i>Matthew J. Kraeutler, BS, The Rothman Institute, Philadelphia, PA</i><br><i>*Presented by Bradford S. Tucker, MD</i>  | 9:15am–9:21am | <b>Resident/Fellow Travel Grant Award Winner</b><br>Incidence and Risk Factors for Hospital-Acquired Clostridium Difficile Infection in Orthopaedic Surgery Patients<br><i>Kirk A. Campbell, MD, New York University Hospital for Joint Diseases, New York, NY</i>              |
| 9:27am–9:33am | Arthroscopic Treatment of Internal Rotation Contracture and Glenohumeral Dysplasia in Brachial Plexus Birth Palsy<br><i>Joshua M. Abzug, MD, Shriners Hospital for Children, Philadelphia, PA</i>   | 9:22am–9:28am | <b>Resident/Fellow Travel Grant Award Winner</b><br>Long-Term Results of Cryosurgery for Treatment of Low-Grade Chondrosarcoma<br><i>Morteza Meftah, MD, Hospital for Special Surgery, New York, NY</i>   |
| 9:34am–9:40am | Evaluation of Information Available on the Internet Regarding Anterior Cruciate Ligament Reconstruction<br><i>Ian C. Duncan, MD, The Rothman Institute, Philadelphia, PA</i>  |               |   |
| 9:41am–9:47am | High School Wrestling: Return to Match<br><i>Jeremie Michael Axe, MD, First State Orthopaedics, Newark, DE</i>  |               |   |

\* Institution by abstract presenter's name is the location where the research took place.

## Friday, June 22, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50

<p>9:48am–9:54am Normal Aging Predisposes to Gastrocnemius-Achilles Muscle-Tendon Unit Pathology by Altering In Vivo Passive Biomechanical Properties in the Rat <i>Johannes F. Plate, MD, Wake Forest School of Medicine, Winston-Salem, NC</i></p> <p>9:54am–10:05am <b>Discussion</b></p> <p>10:05am–10:25am <b>Break — Please visit with exhibitors</b></p>	<p>9:29am–9:35am Effect of Soluble Fillers on the Elution Properties of PMMA Based Bone Cements <i>John A. Handal, MD, Einstein Medical Center, Philadelphia, PA</i></p> <p>9:36am–9:42am <b>Resident/Fellow Travel Grant Award Winner</b> Organism Profile in Periprosthetic Joint Infection (PJI): Do Infecting Pathogens Differ in Europe Versus the United States? <i>Hooman Bakhshi, The Rothman Institute, Philadelphia, PA</i></p> <p>9:43am–9:49am A Biomechanical Assessment of the Contact Stress Patterns Across the Tibial Plateau During Simulated Normal Gait and Stair Climb <i>Ian Hutchinson, MD, Hospital for Special Surgery, New York, NY</i></p> <p>9:50am–9:56am Are Bilateral Total Joint Replacement Patients at a Higher Risk of Developing Pulmonary Embolism Following Total Hip and Knee Surgery? <i>Geoffrey H. Westrich, MD, Hospital for Special Surgery, New York, NY</i></p> <p>9:56am–10:05am <b>Discussion</b></p> <p>10:05am–10:25am <b>Break — Please visit with exhibitors</b></p>
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### General Session IX — AAOS Report, Special Lecture & Presidential Guest Speaker (Bellvue Room)

**Moderator:** Henry A. Backe Jr., MD

<p>10:25am–10:40am AAOS Report <i>John R. Tongue, MD, President, American Academy of Orthopaedic Surgeons, Portland, OR</i></p> <p>10:40am–10:55am Special Guest Lecture — The Double Hand Transplant Experience <i>David J. Bozentka, MD, Presbyterian Medical Center, Philadelphia, PA</i></p>	<p>10:55am–11:45am Presidential Guest Speaker <i>Derek J. W. McMinn, MD, FRCS, Birmingham, UK</i></p> <p>11:45am–12:45pm <b>Industry Workshop Luncheon — Auxilium Pharmaceuticals, Inc. (CME credit not available)</b></p>
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# Friday, June 22, 2012

(Presenters and times are subject to change.)  
 Disclosure Information is listed on pages 44-50.

## Concurrent Symposia VII — Shoulder Elbow (Triuna Room)

**Moderators:** David L. Glaser, MD  
 Brian J. Galinat, MD

### Double vs Single Row for Cuff Repair

- 12:45pm–12:53pm Double  
*David L. Glaser, MD, Presbyterian Hospital, Philadelphia, PA*
- 12:53pm–1:01pm Single Row  
*Mark J. Lemos, MD, Lahey Clinic, Peabody, MA*
- 1:01pm–1:05pm **Discussion**
- AC Separation**
- 1:05pm–1:15pm AC Recon: Scope Is the Way to Go  
*David L. Glaser, MD, Presbyterian Hospital, Philadelphia, PA*
- 1:15pm–1:25pm Don't Throw Away the Knife — Open It  
*Mark J. Lemos, MD, Lahey Clinic, Peabody, MA*
- 1:25pm–1:35pm SLAP Repair — When Is It Truly Indicated and Pearls  
*G. Russell Huffman, MD, Penn Orthopaedics, Philadelphia, PA*
- 1:35pm–1:45pm Proximal Humeral Fractures: Who Needs Surgery?  
*Paul M. Sethi, MD, Orthopaedic and Neurosurgery Specialists, Greenwich, CT*
- 1:45pm–1:55pm Distal Humerus Fractures — Tricks of the Trade  
*G. Russell Huffman, MD, Penn Orthopaedics, Philadelphia, PA*
- 1:55pm–2:00pm **Discussion**
- 2:00pm–3:00pm **Scientific Poster Session** (Poster Presenters Available) (*Abenia and Evelley Rooms*)
- 3:00pm–4:00pm **Multimedia Session** (*Ballroom Foyer*)

## Concurrent Symposia VIII — Arthroplasty (*Bellvue Room*)

**Moderators:** Javad Parvizi, MD, FRCS  
 Amar S. Ranawat, MD

- 12:45pm–12:55pm Dislocation and Neurpraxia  
*Frank Congiusta, MD, Northeast Orthopaedics, Albany, NY*
- 12:55pm–1:04pm Infection Detection  
*Javad Parvizi, MD, FRCS, The Rothman Institute, Philadelphia, PA*
- 1:04pm–1:13pm Ten Pearls for Revision Hip  
*Gwo-Chin Lee, MD, University of Pennsylvania, Philadelphia, PA*
- 1:13pm–1:22pm Stiff Total Knee — My Approach  
*Charles L. Nelson, MD, Penn Orthopaedics, Philadelphia, PA*
- 1:22pm–1:31pm 5 Revision Knee Pearls  
*Norman A. Johanson, MD, Hahnemann Orthopaedics, Philadelphia, PA*
- Approach THA 'Mine Is Better' (Debate)**
- 1:31pm–1:40pm Anterior  
*Charles L. Nelson, MD, Penn Orthopaedics, Philadelphia, PA*
- 1:40pm–1:49pm Hardinge  
*Eric L. Hume, MD, Penn Presbyterian Medical Center, Philadelphia, PA*
- 1:49pm–1:58pm Posterior  
*Geoffrey H. Westrich, MD, Hospital for Special Surgery, New York, NY*
- 1:58pm–2:08pm Special Lecture: Modern Techniques of Unicompartamental Total Knee Robotics and Custom Jig Implants  
*Anil S. Ranawat, MD, Hospital for Special Surgery, New York, NY*
- 2:00pm–3:00pm **Scientific Poster Session** (Poster Presenters Available) (*Abenia and Evelley Rooms*)
- 3:00pm–4:00pm **Multimedia Session** (*Ballroom Foyer*)

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## Saturday, June 23, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

### General Session X — Case Reviews (Bellvue Room)

**Moderators:** Samir Mehta, MD  
Saqib Rehman, MD

6:00am–7:00am Case Presentations — Attendees invited to present cases

7:00am–7:20am Second Business Meeting

### Concurrent Session XI — Lower Extremity/Trauma (Bellvue Room)

**Moderators:** Samir Mehta, MD  
Saqib Rehman, MD

- 7:20am–7:26am Should They Stay or Go? The Effects of Hospital Transfer on Trauma Patients  
*Michael Bercik, MD, The Rothman Institute, Philadelphia, PA*  
*\*Presented by Fabio Orozco, MD*
- 7:27am–7:33am Intra-Articular Psoas Tendon Release Alters Fluid Flow During Hip Arthroscopy  
*Bryan Hanypsiak, MD, Arthrex, Inc., Naples, FL*
- 7:34am–7:40am **Resident/Fellow Award Winner**  
Treatment of Pertrochanteric Fractures (AO/OTA 31-A1 and A2): Long Versus Short Cephalomedullary Nailing  
*Kaan S. Irgit, MD, Geisinger Medical Center, Danville, PA*
- 7:41am–7:47am Cadaveric and Computed Tomographic Anatomy of the Distal Femoral Articular Capsule  
*Carlos A. Sagebien, MD, Robert Wood Johnson University Hospital, New Brunswick, NJ*  
*\*Presented by Matt Werger, MD*
- 7:48am–7:54am Post-Splinting X-Rays of Minimally Displaced Fractures: Good Medicine or Medicolegal?  
*Sonia Chaudhry, MD, NYU Hospital for Joint Diseases, New York, NY*

### Concurrent Session XII — Knee (Triuna Room)

**Moderators:** John C. Richmond, MD  
Fotios P. Tjoomakaris, MD

- 7:20am–7:26am Persistence of MSSA and MRSA Among Arthroplasty Patients After Use of a Decolonization Protocol  
*Carl A. Deirmengian, MD, Lankenau Institute for Medical Research, Wynnewood, PA/Philadelphia College of Osteopathic Medicine /The Rothman Institute, Philadelphia, PA*
- 7:27am–7:33am Trends in Simultaneous Bilateral Total Knee Arthroplasty  
*Lazaros Poultsides, MD, PhD, Hospital for Special Surgery, New York, NY/The Rothman Institute of Orthopaedics, Thomas Jefferson University, Philadelphia, PA*
- 7:34am–7:40am The Role of Aquacel Ag Hydrofiber Wound Dressing with Ionic Silver in Reducing Periprosthetic Joint Infection Following Total Joint Arthroplasty  
*Jenny Cai, BS, The Rothman Institute, Philadelphia, PA*
- 7:41am–7:47am The Effects of Knee Arthrotomy Closure in Flexion vs. Extension on the Failure of a Barbed Suture: A Randomized Animal Trial  
*Praveen Kadimcherla, MD, Albert Einstein College of Medicine, Bronx, NY*

\* Institution by abstract presenter's name is the location where the research took place.

## Saturday, June 23, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

<p>7:55am–8:06am Time to Surgery for Hip Fractures Using a Trauma Admission Protocol <i>Brett P. Frykberg, MD, University of Florida, Jacksonville, FL</i></p> <p>8:06am–8:10am <b>Discussion</b></p> <p>8:10am–8:15am <b>Change Rooms</b></p>	<p>7:48am–7:54am Antibiotic-Loaded Bone Cement in Total Knee Arthroplasty: Is It Cost Effective? <i>Christina Gutowski, MD, The Rothman Institute, Philadelphia, PA</i></p> <p>7:55am–8:06am Seasonality of Infection Rates After Total Joint Replacement <i>Zachary Post, MD, AtlantiCare Regional Medical Center, Mainland Division, Pomona, NJ</i> <i>*Presented by Alvin Ong, MD</i></p> <p>8:06am–8:10am <b>Discussion</b></p> <p>8:10am–8:15am <b>Change Rooms</b></p>
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### Concurrent Session XIII — General (Triuna Room)

**Moderators:** Robert P. Boran Jr., MD  
Marc J. Levine, MD

<p>8:15am–8:21am Anatomic Lateral Ligament Reconstruction in the Ankle: A Hybrid Technique in the Athletic Population <i>Christopher D. Murawski, Hospital for Special Surgery, New York, NY</i></p> <p>8:22am–8:28am NYS Workers' Compensation Medical Treatment Guidelines: Variance Tracking and Guidelines Amendment Program <i>John M. Olsewski, MD, New York State Society of Orthopaedic Surgeons, Albany, NY/ Hospital for Joint Diseases/NYU Langone Medical Center, New York, NY</i></p> <p>8:29am–8:35am Predictors of Pulmonary Embolism in Orthopaedic Patient Population <i>Scott R. Hadley, MD, NYU Hospital for Joint Diseases, New York, NY</i></p> <p>8:36am–8:42am Surgical Care Improvement Project (SCIP) and Venous Thromboembolism and Surgical Site Infection in Patients Undergoing Total Joint Arthroplasty <i>Mohammad R. Rasouli, MD, The Rothman Institute, Philadelphia, PA</i></p>
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### Concurrent Session XIV — Arthroplasty (Bellvue Room)

**Moderators:** David W. Romness, MD  
Amar S. Ranawat, MD

<p>8:15am–8:21am Avoiding Complications with Early Diagnosis and Treatment of Clostridium Difficile After Hip and Knee Arthroplasty <i>Anthony Tokarski, BS, The Rothman Institute, Philadelphia, PA</i></p> <p>8:22am–8:28am Use of Fluoroscopy with Direct Anterior Approach Decreases Variability of Acetabular Component Placement <i>Ajit Deshmukh, MD, Center for Joint Preservation &amp; Reconstruction NorthshoreLIJ/Lenox Hill Hospital, New York, NY</i></p> <p>8:29am–8:35am Oxidative Degradation Is Not a Concern in a First-Generation Annealed Highly Cross-Linked Polyethylene in Young and Active Patients at Ten Years <i>Danyal Nawabi, MD, FRCS(Orth), Hospital for Special Surgery, New York, NY</i></p> <p>8:36am–8:42am Pulmonary Embolism After Total Joint Arthroplasty: IVC Filters Are Safer than Heparin and Cost-Effective <i>Ibrahim J. Raphael, MD, The Rothman Institute, Philadelphia, PA</i></p>
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\* Institution by abstract presenter's name is the location where the research took place.

## Saturday, June 23, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

- 8:43am–8:49am Access to Arthroplasty: The Medicaid Program  
*Carlos J. Lavernia, MD, Arthritis Surgery Research Foundation, Miami, FL*
- 8:49am–9:05am **Discussion**
- 9:05am–9:35am **Break — Please visit with exhibitors**

- 8:43am–8:49am Bilateral Total Knee Replacement: Costs and Reimbursement  
*Jesus M. Villa, MD, Arthritis Surgery Research Foundation, Miami, FL*
- 8:49am–8:55am **Discussion**
- 8:55am–9:05am Focus Video Bone Marrow Edema in Patients with Knee OA: Significance and Results of Treatment  
*Peter F. Sharkey, MD, The Rothman Institute, Philadelphia, PA*
- 9:05am–9:35am **Break — Please visit with exhibitors**

### Symposia IX — Joint Preservation: Shoulder and Elbow (Bellvue Room)

**Moderator:** G. Russell Huffman, MD

- 9:35am–9:55am Arthroscopy for Elbow Arthritis  
*(Buddy) Felix H. Savoie III, MD, Tulane University, New Orleans, LA*
- 9:55am–10:15am Management of GH Arthritis in Younger Patient  
*(Buddy) Felix H. Savoie III, MD, Tulane University, New Orleans, LA*
- 10:15am–10:25am Massive Cuff Tears — My Approach  
*Ilya Voloshin, MD, University of Rochester Medical Center, Rochester, NY*
- 10:25am–10:35am Discussion — Ask the Experts

### General Session XV — Reports, BOC and OREF (Bellvue Room)

**Moderator:** John D. Kelly IV, MD

- 10:35am–10:45am Report of BOC Representative  
*John C. Richmond, MD, New England Baptist Hospital, Boston, MA*
- 10:45am–10:50am OREF Report  
*Ramon L. Jimenez, MD, Monterey, CA*
- 10:50am–11:05am How To Give Back: Chambersburg Experience  
*Robert N. Richards Jr., MD, Chambersburg, PA*
- 11:05am–11:10am **Change Rooms**

### Concurrent Symposia X — General Trauma (Triuna Room)

**Moderator:** Jaimo Ahn, MD, PhD

- 11:10am–11:20am Hip FX: Always IM  
*Samir Mehta, MD, Hospital of the University of Pennsylvania, Philadelphia, PA*
- 11:20am–11:30am “Not So Fast Ahn”  
*Samir Mehta, MD, Hospital of the University of Pennsylvania, Philadelphia, PA*

### Concurrent Symposia XI — Sports (Bellvue Room)

**Moderator:** Brian J. Sennett, MD

- 11:10am–11:17am Bottom Line on Double Bundle ACL  
*Fotios P. Tjoumakaris, MD, Rothman Institute Orthopaedics Jefferson Medical College, Egg Harbor Township, NJ*
- 11:17am–11:24am MPFL Reconstruction — Is It Indicated?  
*John D. Kelly IV, MD, University of Pennsylvania, Philadelphia, PA*

\* Institution by abstract presenter's name is the location where the research took place.

## Saturday, June 23, 2012

(Presenters and times are subject to change.)

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- 11:30am–11:40am Tibia Salvage Update  
*Saqib Rehman, MD, Temple University, Philadelphia, PA*
- 11:40am–11:50am Damage Control — Fact or Fiction  
*Jaimo Ahn, MD, PhD, University of Pennsylvania Hospital, Philadelphia, PA*
- 11:50am–11:55am Discussion — Ask the Experts-Cases
- 11:55am–12:00pm **Change Rooms**

- 11:24am–11:31am ACL Recon — How Are We Really Doing?  
*Brian J. Sennett, MD, University of Pennsylvania, Philadelphia, PA*
- 11:31am–11:38am Special Focus Video — Elbow Arthroscopy  
*Neal C. Chen, MD, The Philadelphia Hand Center, Philadelphia, PA*
- 11:38am–11:55am Discussion — Ask the Experts-Cases
- 11:55am–12:00pm **Change Rooms**

### Concurrent Session XVI — Upper Extremity (Bellvue Room)

**Moderators:** David S. Zelouf, MD  
David J. Bozentka, MD

- 12:00pm–12:10pm Guest Lecture: Pediatric Upper Extremity Fracture Update  
*Joshua M. Abzug, MD, University of Maryland School of Medicine, Timonium, MD*
- 12:11pm–12:17pm MMP and TIMP Imbalance in Carpal Tunnel Syndrome  
*Yvette Ho, MD, Maimonides Medical Center, Brooklyn, NY*
- 12:18pm–12:24pm **Resident/Fellow Travel Grant Award Winner**  
Three Dimensional Morphometric Analysis of the Anterior Elbow Capsule  
*Abdo Bachoura, MD, University of Kentucky, Lexington, KY*
- 12:25pm–12:31pm Anatomic Relationship of the Palmaris Longus and Long Finger Flexor Digitorum Superficialis Tendons to the Ulnar Artery and Median Nerve at the Distal Flexion Crease of the Wrist  
*James A. Wilkerson, MD, University of Maryland, Baltimore, MD*  
*\*Presented by David S. Zelouf, MD*
- 12:31pm–12:37pm **Discussion**

### Concurrent Session XVII — Spine/Pediatrics (Triuna Room)

**Moderators:** Robert V. Dawe, MD  
James T. Guille, MD

- 12:00pm–12:10pm Guest Lecture: Disc Replacement — Here to Stay?  
*Robert V. Dawe, MD, Orthopaedic Specialty Group, Fairfield, CT*
- 12:11pm–12:17pm **Resident/Fellow Travel Grant Award Winner**  
Incidence and Morbidity of Concomitant Spine Fractures in Combat Related Amputees  
*Adam Bevevino, MD, Walter Reed National Military Medical Center, Bethesda, MD*
- 12:18pm–12:24pm Unilateral Hip Reconstruction in Children with Cerebral Palsy: Predictors for Failure  
*Pinak Shukla, MD, Tufts Medical Center, Boston, MA*
- 12:24pm–12:33pm **Discussion**
- 12:33pm–12:39pm Evaluation of Poly-Articular Lyme Disease in the Pediatric Population  
*Amiethab A. Aiyer, MD, Penn State/Hershey Medical Center, Philadelphia, PA*

\* Institution by abstract presenter's name is the location where the research took place.

## Saturday, June 23, 2012

(Presenters and times are subject to change.)

Disclosure Information is listed on pages 44-50.

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| <p>12:37pm–12:43pm A Safe Alternative for Carpal Tunnel Injections: Proximal Palmar Entry<br/><i>Sekinat Kassim, MD, Howard University Hospital, Washington, DC</i><br/><i>*Presented by Henry Paul Jr., MD</i></p> <p>12:44pm–12:50pm Evaluating Return to Play Status and Functional Outcome After Ulnar Collateral Ligament Reconstruction Using a Validated Assessment Tool<br/><i>Robert J. Stewart, MS, The Rothman Institute at Thomas Jefferson University, Philadelphia, PA</i><br/><i>*Presented by Daniel F. O'Brien, BA</i></p> <p>12:51pm–12:57pm Upper Extremity Amputation Is a Predictor of Increased Five Year Mortality in Patients on Dialysis<br/><i>Naiping Michael Xu, MD, Wake Forest University School of Medicine, Winston-Salem, NC</i></p> <p>12:57pm–1:03pm The Efficacy of Splinting and Home Therapy After Injection of Collagenase Clostridium Histolyticum for Dupuytren's Contracture<br/><i>Heather A. McMahon, BS, The Philadelphia Hand Center, Philadelphia, PA</i></p> <p>1:03pm–1:10pm <b>Discussion</b></p> <p>1:10pm–1:15pm <b>Change Rooms</b></p> | <p>12:40pm–12:46pm <b>Resident/Fellow Award Winner</b><br/>Pedicle Screw "Hubbing" in the Adult and Immature Thoracic Spine: A Biomechanical and Micro-Computed Tomography Evaluation<br/><i>Daniel G. Kang, MD, Walter Reed National Military Medical Center, Bethesda, MD</i></p> <p>12:47pm–12:53pm <b>Resident/Fellow Travel Grant Award Winner</b><br/>Comparison of Long Term (5 Year) Reoperation Rates and Outcomes for Long Fusions to the Sacrum for Adult Deformity: Primary vs. Revision Surgery<br/><i>Michael Faloon, MD, Hospital for Special Surgery, New York, NY</i></p> <p>12:54pm–1:00pm <b>Resident/Fellow Travel Grant Award Winner</b><br/>Does Preoperative Narcotic Use Persist After Spinal Deformity Surgery? A Comparison of Non-Narcotic and Narcotic Using Groups<br/><i>Addisu Mesfin, MD, Washington University, St. Louis, MO</i></p> <p>1:00pm–1:10pm <b>Discussion</b></p> <p>1:10pm–1:15pm <b>Change Rooms</b></p> |
|--|--|

### Symposia XII — Hand/Wrist Fixation (Bellvue Room)

**Moderators:** David R. Steinberg, MD  
David S. Zelouf, MD

- 1:15pm–2:15pm Distal Radius Fractures with Case Presentations  
*David R. Steinberg, MD, Penn Orthopaedics, Philadelphia, PA*  
*David S. Zelouf, MD, The Philadelphia Hand Center, Philadelphia, PA*  
*David J. Bozentka, MD, Presbyterian Medical Center, Philadelphia, PA*

2:30pm–3:30pm **Scientific Poster Session** (Poster Presenters Available) (*Abenia and Evelley Rooms*)

3:30pm–4:30pm **Multimedia Session** (*Ballroom Foyer*)

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\* Institution by abstract presenter's name is the location where the research took place.

## 2012 Scientific Program Abstracts — Thursday

(An asterisk (\*) by an author's name indicates the presenter.)

**Thursday, June 21, 2012**

**Concurrent Session II — Arthroplasty  
(Triuna Room)**

**Moderators: Geoffrey H. Westrich, MD  
David W. Romness, MD**

7:18am–7:24am

**Resident/Fellow Travel Grant Award Winner**

### Periprosthetic Joint Infection: A Fatal Condition?

Benjamin Zmistowski, BS  
Joseph A. Karam, MD  
Joel B. Durinka, MD  
David S. Casper, BS  
Javad Parvizi, MD, FRCS

**Introduction:** Periprosthetic joint infection (PJI) continues to complicate an otherwise successful hip replacement. The management of this condition often requires multiple surgical procedures associated with increased complications and morbidity. This study, first of its kind to our knowledge, examines the relationship between PJI and mortality.

**Methods:** 178 patients (204 admissions) with at least one surgical intervention secondary to confirmed PJI were compared to 1,635 patients (1,955 admissions) undergoing aseptic hip revision. The rate of mortality at 30 days, 90 days, one year, and two years after admission was assessed. Multivariate analysis was used to determine the independence of PJI in predicting mortality. Potential predictors of mortality investigated included age, gender, ethnicity, age-independent Charlson Index, infecting organism, and specific comorbidities.

**Results:** Mortality was significantly greater in patients with PJI versus aseptic revision at 90 days (5.1% vs. 0.9%), at the first-year (10.1% vs. 2.1%), and second year (15.1% vs. 4.1%), respectively. After controlling for age, gender, ethnicity, and Charlson Index, PJI was associated with four-fold increase in mortality compared to patients undergoing revision

surgery for aseptic failures. In the PJI population significant predictors of mortality were increasing age, increasing Charlson Index, and history of cerebrovascular accident.

**Conclusions:** PJI is a devastating complication that severely limits joint function and is consistently difficult to eradicate. However, surgeons must be cognizant of the systemic impact of PJI and its influence on fatal outcome in over one-tenth of patients.

**Notes:**

7:25am–7:31am

### Do Pulmonary Emboli Arise from Lower Extremity Deep Venous Thrombosis?

Raviinder Parmar, MD  
Ronald Huang, BS  
Ibrahim J. Raphael, MD  
Richard H. Rothman, MD, PhD  
Javad Parvizi, MD, FRCS

**Introduction:** Venous thromboembolism (VTE) is an important complication that may occur following total joint arthroplasty (TJA). It is a commonly held belief that pulmonary emboli (PE) arise from a deep venous thrombosis (DVT) and that prevention of DVT will lead to a reduction in PE. Our study was designed to examine the association between symptomatic DVT and PE in a consecutive group of patients undergoing TJA.

**Materials and Methods:** This prospective study was initiated in April of 2010. 1710 TJA were performed at our institution between April of 2010 and December of 2010. Patients who had signs/symptoms of VTE postoperatively, were evaluated for both DVT and PE. 129 patients were evaluated for DVT and/or PE by lower extremity ultrasound (US), chest CT, or V/Q scan within 90 days of arthroplasty. Of the 129 patients who were evaluated for VTE, 78 had symptoms of DVT and 51 had symptoms of PE. A test of association was performed in order to determine if the odds of developing positive symp-

tomatic PE was significantly increased following positive symptomatic DVT and vice versa.

**Results:** Of the 79 patients with symptoms of DVT, 14 had evidence of DVT of the lower extremities. Of 52 patients with suspected PE, 16 had PE based on imaging. Of 37 scanned for both DVT and PE, only 7 patients (19% of those scanned for DVT and PE, 5.4% of the total cohort) had both DVT and PE.

**Discussion and Conclusion:** It appears that the commonly held notion that PE arise from symptomatic or asymptomatic DVT requires re-examination. PE and DVT may be part of a hypercoagulable state that can arise independent of each other. Thus, guidelines that use DVT as a proxy for PE may result in over anticoagulation of patients with all its associated risks.

**Notes:**

7:32am–7:38am

## Risk Factors for Pulmonary Embolism Following TJA

Javad Parvizi, MD, FRCS  
 Ronald Huang, BS  
 William V. Arnold, MD  
 Ibrahim J. Raphael, MD  
 James J. Purtill, MD  
 Richard H. Rothman, MD, PhD

**Introduction:** Prophylaxis of venous thromboembolism (VTE) following total joint arthroplasty (TJA) presents the clinical dilemma of balancing postoperative thrombotic risk and anticoagulation-related complications such as bleeding, hematoma formation, and infection. Pulmonary embolism (PE) risk stratification of patients undergoing TJA is needed in order to tailor prophylaxis based on thrombotic and bleeding risk. The purpose of this study is to investigate whether preoperative co-morbid conditions can be utilized to predict increased risk of development of PE following primary and revision joint arthroplasty.

**Methods and Materials:** Following IRB approval, we identified 26,415 primary and revision TJA cases performed at our institution between January 2000 and April 2011. 24,567 patients received warfarin prophylaxis for six weeks (targeted International Normalized Ratio of 1.5 to 1.8) and 1,824

patients received aspirin 325mg twice daily. 24 patients receiving heparin and heparin derivatives were excluded. Cases of symptomatic PE were identified from our prospective database and confirmed by reviewing all chest computed tomography and ventilation perfusion scans performed. Demographics and comorbidities were also collected from our database. Backwards stepwise logistic regression was utilized to identify independent predictors of PE up to 90 days postoperatively following TJA.

**Results:** PE incidence following primary and revision TJA at our institution was 1.1% (281 out of 26,391). The mean age of our patient population was 69.4 years and the average BMI was 32.0 kg/m<sup>2</sup>. Incidence of fatal PE was 0.02% (4 of 26,391). Multivariate analysis identified elevated BMI ( $p<0.035$ ), procedures on the knee ( $p<0.006$ ), higher Charlson Comorbidity Index (CCI) ( $p<0.015$ ), COPD ( $p=0.006$ ), atrial fibrillation ( $p<0.001$ ), anemia ( $p<0.001$ ), presence of DVT ( $p<0.001$ ), and depression ( $p=0.012$ ) as independent risk factors for PE. Connective tissue disease was found to be protective from development of PE ( $p=0.052$ ).

**Conclusion:** Patients that are obese, undergo knee procedures, have an elevated CCI, COPD, atrial fibrillation, anemia, depression, and postoperative DVT are at a higher risk of developing a postoperative pulmonary embolism. These risks factors should be considered when deciding upon postoperative anticoagulation prophylaxis.

**Notes:**

7:39am–7:45am

## The Effect of Laminar Air Flow and Door Openings on Contamination in the Operating Room

Eric B. Smith, MD  
 Ibrahim J. Raphael, MD  
 Kyle Dolan, BS  
 Sittisak Honsawek, MD  
 Elizabeth Younkins, RN  
 Mitchell G. Maltenfort, PhD

**Introduction:** The reported risk of periprosthetic joint infection (PJI) ranges from 1.5-2.5% after joint arthroplasty

(TJA). Laminar airflow (LAF) systems are reported to significantly reduce infection rates. Air turbulence, which can occur with repeated operating room (OR) door openings, has been associated with a faster spread of organisms. This study evaluates the association of laminar airflow and OR traffic with intraoperative contamination rates.

**Materials and Methods:** Electronic door counters were installed on all doors of 3 operating rooms. Two sterile basins were placed in each room during 81 cases, one inside and one outside the LAF. 692 surface samples were taken from the basins using Replicate Organism Detection and Counting (RODAC) plates. One plate from each basin was sent for culture at successive 30-minute intervals from the time of incision until wound closure. Results were reported after 7 days of incubation. Data gathered on each case included procedure type, culture results, number of door openings, number of people present at collection time, temperature and humidity.

**Results:** At 30, 60, 90, and 120 minute-intervals, 39%, 53%, 57%, 60% and 53%, 68%, 79%, 64% of the plates were contaminated inside and outside the LAF, respectively. The average number of door openings was 54.6/case (0.62/minute). Estimated cumulative increase in CFU counts was 1.2% per door opening independent of LAF. Operating under laminar airflow decreased microbial counts by 34% and decreased the incidence of contamination by 48%.

**Discussion and Conclusion:** Operating under laminar airflow appears to independently reduce the risk of contamination and microbial counts. An increased number of door openings correlated with a higher rate of contamination of the sterile OR setup. This high rate of contamination can potentially lead to increased surgical infections. Restricting the number of door openings and performing surgeries under the laminar airflow may decrease infection risks following TJA.

**Notes:**

7:46am–7:52am

**Resident/Fellow Travel Grant Award Winner**

## Patients with Atrial Fibrillation Undergoing Total Joint Arthroplasty (TJA) Increase Hospital Burden

Vinay K. Aggarwal, BS  
Eric H. Tischler, BA  
Zachary Post, MD  
Ian Kane  
Fabio Orozco, MD  
Alvin Ong, MD

**Introduction:** More than 3 million people suffer from atrial fibrillation in the United States, most of who are on anticoagulation therapy for life. No current literature describes the increased hospital burden from this subset of TJA patients. The goal of this study is to examine the effect of chronic anticoagulation for atrial fibrillation on patients undergoing TJA.

**Methods:** We retrospectively reviewed all patients undergoing either primary or revision TJA at our facility from March 2007 to September 2011. 158 patients with atrial fibrillation (Group A) were compared to 117 matched controls (Group B) (total of 106 hips and 169 knees; 166 primaries and 109 revisions). Groups were compared using multivariate logistic regression (diagnosis of atrial fibrillation, joint, revision vs. primary) for length of stay, post-operative Hgb levels, transfusion requirements and readmissions.

**Results:** Total length of stay (7.0 vs. 3.5 days) was significantly longer for patients in Group A. Joint and procedure type did not affect length of stay. Baseline Hgb (12.8 vs. 13.8), POD2 Hgb (9.8 vs. 10.4), and POD3 Hgb (9.7 vs. 10.1) were significantly decreased in Group A, but no difference in Hgb was significant on POD1, POD4, POD5, or discharge. Group A had higher transfusion incidence (10.3% vs. 4.3%) and discharge INR (1.82 vs. 1.68). Diagnosis of atrial fibrillation (OR 12.3, 95% CI 4.2-35.8) and revision type procedure (OR 1.9, 95% CI 1.0-3.8) significantly increased odds of complication and readmission after TJA.

**Discussion:** Patients with preoperative atrial fibrillation undergoing TJA have increased length of stay as well as increased post-operative anemia and transfusion requirements. Moreover, these patients have an increased risk of complications and unplanned readmission. In an environment where complications and readmissions can negatively affect hospital and physician reimbursement, we recommend increased sur-

veillance of these patients to appropriately manage expectations and decrease complication rates.

**Notes:**

7:58am–8:04am

## Charlson Comorbidity Index Is Better than ASA Scores in an Orthopedic Patient Population

Bahar Adeli, BA  
 Marcelo Casaccia, MD  
 William J. Hozack, MD  
 Richard H. Rothman, MD, PhD  
 Javad Parvizi, MD, FRCS

**Introduction:** Preoperative comorbidities are strong predictors of both morbidity and mortality after surgery and can be measured in a variety of ways. Perhaps the best known is the American Society of Anesthesiologists' (ASA) physical status classification system, widely used to describe the overall health of the patient and burden of comorbidities. The score is ideal in being simple to apply and requiring no laboratory data, but substantial interobserver variation in score assignment is not uncommon. Another scoring system of preoperative comorbidities is the Charlson Comorbidity Index, which assigns weights to a variety of systemic diseases and predicts long-term survival. While more detailed than the ASA classification, this score is usually considered more useful for research purposes than for risk stratification in real time. Our goal is to assess the predictive ability and value of both ASA and Charlson Index scores on patient outcomes following elective total hip and total knee arthroplasty.

**Methods:** We conducted a retrospective chart review of 15,599 primary hip and primary knee arthroplasty cases, as well 1,479 revision arthroplasty cases performed between 2000-2011 at Thomas Jefferson University Hospital. The Charlson Index is a weighted index based on comorbidities, such as diabetes, malignancy, congestive heart failure, renal disease, associated with an increased risk of mortality during longitudinal clinical studies. The Charlson Index was calculated according to the method outlined by Charlson and Pompei from comorbidities listed in our database. Primary outcome measurements included 90-day mortality and post-

operative complications such as: DVT, PE, joint infection, persistent wound drainage/hematoma, renal complications, MI, stroke, pneumonia, UTI, and mechanical failure. Post-operative complications were obtained through a review of the discharge summaries. Statistical analysis was performed to determine which comorbidity scale had a greater correlation with post-operative morbidity and mortality and therefore was a better predictor of outcome.

**Results:** Both Charlson and ASA values were good predictors of cardiovascular event, renal failure, PE, DVT, and 90-day mortality ( $p < 3$  months post-operative). Significant correlations were not observed when evaluating ASA and Charlson values as predictors of post-operative complications in our cohort of revision arthroplasty patients.

**Conclusion:** Our results demonstrate that the Charlson Comorbidity Index is a better overall predictor of mortality and complications, particularly mechanical failure and acute infection, following a primary TJA. Therefore, we believe it is more appropriate measure of outcome in an orthopaedic patient population than the ASA score. Furthermore, as the number of comorbidities in each patient increases, ASA becomes increasingly less likely to be specific enough to predict which patient will have post-operative complications. It is advisable to record this measure for all THA and TKA patients prior to their joint replacement surgery it would appear prudent to do so given the extreme ease and low cost of this measure and its correlation to postoperative complications.

**Notes:**

8:05am–8:11am

### *Resident/Fellow Award Winner*

## Optimal ESR and CRP Cut-Off Values Based on New Criteria for Definition of Periprosthetic Joint Infection

Pouya Alijanipour, MD  
 Hooman Bakhshi  
 Javad Parvizi, MD, FRCS

**Introduction:** Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are valuable inflammatory markers for

the diagnosis of periprosthetic joint infection (PJI). Previous studies reporting cut-off points for these markers included small numbers of patients and were inconsistent in terms of definition for PJI. This study aims to determine optimal cut-off values based on recently defined criteria for PJI in a large study cohort.

**Methods:** In this retrospective study, 1993 patients who underwent revision arthroplasty for either aseptic failure (1095 hips, 594 knees) or first onset PJI (112 hips, 192 knees) between 2000-2009 were included. The diagnosis of PJI was independent of ESR and CRP. Exclusion criteria were comorbid conditions with confounding effect on inflammatory parameters. Receiver operating characteristic (ROC) examination was performed to determine optimal cut-off points and test characteristics for ESR and CRP in hips and knees separately. Nomograms for estimating probability of PJI from ESR and CRP values were calculated.

**Results:** ESR and CRP were significantly higher in PJI group. Optimal cut-off points for ESR were 48.5 mm/hr and 36.5 mm/hr in hips and knees, respectively. For CRP, 1.35 mg/dL and 2.35 mg/dL were cut-off values in hips and knees, respectively. Combining ESR and CRP yielded well performing ROC curves for both hips and knees with area under the curve of 0.95 and 0.96, sensitivity of 87.6 and 88.1, and specificity of 92.1 and 96.4, respectively.

**Discussion and Conclusion:** This study confirms the utility of ESR and CRP as a combination test in the diagnosis of PJI in a large population size at a single institution. Our findings suggest that while conventional thresholds for these inflammatory markers are still useful, they may need to be refined in order to improve the accuracy of this test battery as a diagnostic criterion in PJI setting.

**Notes:**

8:12am–8:18am

### Radiologic Evaluation of Acetabular Retroversion in Femoroacetabular Impingement: The Value of the Acetabular Retroversion Index

Claudio Diaz-Ledezma, MD  
Carlos A. Higuera, MD  
Javad Parvizi, MD, FRCS

**Introduction:** Various radiologic signs have been used to describe acetabular retroversion in FAI, but to the date the prognostic value of these signs is unknown. The aim of this study is to evaluate the risk of chondral and labral lesions associated with radiologic signs of acetabular retroversion in FAI.

**Material and Methods:** Ninety three patients (50.5% males, age: 35.8±12.4 [15.5-62.7]) underwent surgery due to FAI were included. Preoperative X rays were evaluated with software which corrects the tilt and rotation of the pelvis image, in order to have reliable information and measurements. Four radiologic parameters related with acetabular retroversion (Cross-over sign, Posterior wall sign, ischial spine sign and acetabular retroversion index (ARI)) were evaluated to study their association with intraoperative confirmed chondral and labral lesions.

**Results:** No association was observed between the radiologic retroversion signs and the type of labral tears. The only radiologic sign significantly associated with chondral lesions was ARI. As ARI is a continuous variable, a cut point was established on the basis of results (ARI<20%). ARI < 20% was associated with absence of chondral lesions. After adjustment by radiologic osteoarthritis and age, ARI<20% remains significant to predict absence of chondral lesions (OR: 12.07 [CI: 1.16-125.08]). A predictive model was proposed (multivariate analysis and ROC curve). The coexistence of ARI<20%, Tonnis 0 and age < 32 year –old predicts absence of chondral lesions with a probability of 88%.

**Discussion:** The systematic evaluation of acetabular retroversion provides relevant preoperative information in FAI. ARI<20% was associated with absence of chondral lesions (independently from the grade of radiologic OA or age). This previous non-reported value and the developed predictive model are strongly recommended to evaluate and prognosticate the absence of chondral lesions in FAI.

**Notes:**

8:19am–8:25am

## Predictors of Hospital-Acquired Conditions After Elective Joint Arthroplasty

Carlos A. Higuera, MD  
Ronald Huang, BS  
Javad Parvizi, MD, FRCS

**Introduction:** Medicare and Medicaid require a reduction in Medicare Severity Diagnosis Related Group payments for certain hospital-acquired conditions (HAC). Some of those, including catheter-associated urinary tract infection (UTI), surgical site infections (SSI) and venous thromboembolism (VTE) are potential complications after elective total joint arthroplasty (TJA). These conditions are currently reported and drive payment and quality assessment regardless of age and comorbidities. A risk stratification system is needed for prevention and fair determination of quality and reimbursement. The purpose of this study is to identify predictors of HAC and quantify their risk in a large cohort of patients that underwent TJA in a tertiary health care center.

**Methods:** A cohort of 22,878 patients that underwent elective primary TJA was reviewed retrospectively. Demographics, body mass index (BMI) and comorbidities were identified using electronic medical records. Adjusted hierarchical stepwise multivariate regression models were used to analyze independent risk factors for HAC.

**Results:** Incidence of UTI, SSI, and VTE were 1.3%, 0.8%, and 2.1% respectively. Independent predictors of UTI within 90 days postoperatively were dementia, smoking, urinary incontinence, ischemic heart disease, anemia, connective tissue disease, BPH and increased Charlson Comorbidity Index (CCI). Independent predictors of SSI within 1 year postoperatively were liver disease, HIV infection, ischemic heart disease, connective tissue disease, diabetes mellitus, chronic heart failure, anemia and elevated BMI. Independent predictors for VTE within 90 days postoperatively were active malignancy, atrial fibrillation, diabetes mellitus, increased CCI, and increased BMI.

**Discussion and Conclusions:** There was a significant difference between patients for the risk of developing HAC after TJA. There is a need for risk stratification when assessing quality and reimbursement of TJA procedures. The predictors identified for HAC may be used to develop such risk stratification system.

**Notes:**

8:26am–8:32am

## Post-Operative Use of a Wound Vac for Persistently Draining Wounds Following Hip Arthroplasty

Erik N. Hansen, MD  
\*Gregory K. Deirmengian, MD  
Joel B. Durinka, MD

**Introduction:** Persistent wound drainage following hip arthroplasty is a known risk factor for periprosthetic infection. Negative pressure wound therapy has been used successfully in other surgical fields for closed wound management. The goal of our study was to assess the safety of the wound vac (vac) in the management of postoperative wound drainage after hip arthroplasty. In addition, we sought to determine the success rate and risk factors for failure of the intervention.

**Methods:** Using our institutional database, we identified cases where a vac was used after hip arthroplasty for management of postoperative incisional drainage. We identified patients who failed the vac treatment, requiring subsequent irrigation and debridement (I&D). We then collected clinical data and performed a multivariate analysis to determine predictors of failure.

**Results:** We identified 122 cases over the 4-year period with an average clinical follow up of 2 years. On average, the vac was placed on post-operative day 4 and applied for 2 days. 96 patients (79%) required no further surgery and 26 patients (21%) met our criteria for failure. Eleven of these patients required superficial I&D and twelve required deep I&D, with none requiring further surgical intervention. Three patients required ultimate component removal. Predictors of vac failure included INR level greater than 2, greater than 1 prior hip surgery, vac application greater than 48 hours, and multiple vac applications.

**Conclusion:** The vac is a safe means of managing postoperative drainage after hip arthroplasty with a component retention rate of 98%. Based on our data, we recommend a single 48-hour vac application and to return for I&D if drainage persists. For patients with more than 1 prior hip surgery or with INR greater than 2, aggressive surgical management of persistent drainage is warranted.

**Notes:**

**Thursday, June 21, 2012**

**Concurrent Session III — Sports Shoulder  
(Bellvue Room)**

**Moderator: G. Russell Huffman, MD**

9:10am–9:16am

### **Influence of Graft Source on Outcome After ACL Reconstruction**

Kevin D. Plancher, MD  
Francesca Swartz, DO

**Introduction:** Anterior knee pain is one reason surgeons have been discouraged from using autografts BPTB and have favored allograft BPTB or soft tissue graft selection. The purpose was to study the outcome of patients undergoing ACLR with autograft vs. allograft bone BPTB and resultant pain when kneeling or squatting utilizing a new surgical technique for closure of the donor site.

**Methods:** 183 Patients undergoing ACLR between 1997 and 2010 were evaluated. Exclusion criteria included age less than 16 years. A single surgeon performed all surgeries. Patients were evaluated with H & P, XRays and KT 1000. A new technique of surgical closure that involved non full thickness repair (anterior approximation of tissues 1/3 the thickness of the patella tendon) was utilized when closing the autograft BPTB donor site. All patients completed outcome questionnaires including IKDC, Tegner, and Lysholm. Items specific for anterior knee pain were extracted from the questionnaires for comparison.

**Results:** 168 patients available for follow up (93%). Average follow up was 6 ½ years. Anterior knee pain not found to be significantly different between the autograft and allograft groups during kneeling and squatting or sitting with a knee bent. KT 1000 measurements at 30 pounds and Maximum Manual Testing didn't reveal a difference between the autograft and allograft groups. No significant difference in post operative IKDC or Lysholm. Significant difference noted with change in Tegner Scores before and after surgery. One patient from each group with a traumatic re-rupture.

**Conclusion:** No significant increase in anterior knee pain in the autograft compared to the allograft group. Change in Tegner scores may represent an age related change in activity.

Surgeons shouldn't refrain from an autograft BPTB for fear of anterior knee pain. Results suggest that autograft and allograft BPTB are both appropriate sources for ACLR.

**Notes:**

9:17am–9:23am

### **Partial Articular-Sided Rotator Cuff Tears: A Comparative Study of In-Situ Repair vs Completion of Tear Prior to Repair**

Arun Rajaram, MD  
Paul M. Sethi, MD  
Elifho Obopilwe, MS  
Augustus D. Mazzocca, MS, MD

**Introduction:** Controversy exists over the ideal treatment method for partial thickness rotator cuff tears. The purpose of this study was to evaluate the strain characteristics of the rotator cuff tendon in the presence of a 50% articular-sided partial tear, and compare changes in strain of an in-situ repair as compared to tear completion and repair.

**Methods:** Fourteen fresh-frozen cadaveric shoulders were dissected. Partial articular-sided tears were created, and specimens were repaired by: 1) in-situ repair or 2) completion of tear prior to repair. Strain was measured within 1) intact tendon 2) 50% tear and 3) repaired tear at 45, 60, and 90 degrees of glenohumeral abduction, and in the anterior, middle, and posterior sections of the tendon. Testing was performed with a load of 100 N applied for 30 cycles.

**Results:** Increased strain was statistically significant in two conditions after creation of a 50% articular-sided partial tear: 1) Anterior bursal-sided strain at 60 degrees of abduction, and 2) Posterior articular-sided strain at 90 degrees of abduction. Four conditions displayed statistically significant improved strain and displacement of in-situ repair over completion and repair: 1) Bursal-sided strain in the anterior section of the tendon at 45 degrees and 2) 90 degrees of abduction. 3) Bursal-sided displacement in the anterior section of the tendon at 45 degrees and 4) 90 degrees of abduction.

**Discussion and Conclusion:** Our data currently supports the "50% rule," and suggests that tears less than 50% of the total

tendon thickness can be treated with simple debridement and tears greater than 50% may be considered for repair. When clinically appropriate, we also demonstrated that an in-situ repair, without completion of tear is a viable biomechanical option with lower strain and displacement observed on the bursal side when compared with tear completion and repair.

**Notes:**

9:24am–9:30am

### **Effect of Interference Screw Fixation on Anterior Cruciate Ligament Integrity and Tensile Strength**

Gregory Sawyer, MD  
\*Melissa Christino, MD  
Brett C. Anderson, MD  
David Paller, MS  
Wendell Heard, MD  
Paul Fadale, MD

**Introduction:** Tibial-sided fixation of soft tissue grafts in ACL reconstruction has often been identified as the weak link in the fixation construct, with interference screws being a commonly used technique. A significant concern surrounding the use of interference screws for soft tissue fixation is graft laceration and the possibility of loss of pull-out strength and slippage. The purpose of this study was to determine the biomechanical effect of single interference screw insertion on the integrity and tensile strength of the graft itself.

**Methods:** Two groups of twelve porcine knees (24 total) were utilized for the tibial-sided fixation of porcine flexor digitorum tendons using single-insertion interference screws, in a model of soft tissue ACL reconstruction. Two different screw types were used for comparison. Following screw insertion, the grafts were dissected free and underwent biomechanical testing in tension to failure. The maximum load, stiffness, 2% offset yield load, displacement to yield, and mode of failure were recorded. Control flexor digitorum tendons underwent the same biomechanical testing for comparison.

**Results:** Control soft tissue grafts exhibited significantly higher yield load, ultimate load, and stiffness in comparison to both groups of treated grafts, without evidence of significant

macroscopic damage. Upon completion of the biomechanical testing, all treated grafts were noted to have failed mid-substance, in the area of the graft affected by the interference screw threads.

**Discussion and Conclusion:** Single insertion of interference screws for soft tissue graft fixation in ACL reconstruction weakens the biomechanical properties of the graft itself.

**Notes:**

9:31am–9:37am

### **Shoulder Range of Motion and Strength in Professional Ice Hockey Players**

Randy M. Cohn, MD  
Eric J. Strauss, MD  
Laith M. Jazrawi, MD  
Andrew J. Feldman

**Introduction:** The purpose of this study was to examine the shoulder range of motion (ROM) and strength in a team of North American professional ice hockey players to establish baseline values and examine potential differences based hand dominance, stick handedness, and player position.

**Methods:** Players on a single team underwent a comprehensive examination of shoulder ROM and strength testing. ROM was tested in forward elevation (FE), external rotation at zero degrees of abduction (ER0), external rotation at 90 degrees of abduction (ER90), and internal rotation at 90 degrees of abduction (IR90) using a goniometer per a previously described protocol. Shoulder strength in abduction, internal rotation at zero degrees of abduction (IR0) ER0, ER90, and IR90 were measured with a manual muscle-testing device. Shoulder ROM and strength between right and left extremities were compared within athletes. Comparisons were made between right handed and left handed players, players that shoot right handed versus left handed, and by position between forwards and defenseman using t-tests.

**Results:** Within individual athletes, there was no difference in ROM or strength between right and left shoulders in all variables tested. There was no difference in shoulder ROM or strength between the dominant and non-dominant shoulder and players that shoot right handed versus left handed. Defen-

seman had a statistically significant increase in ERO of the left shoulder (66 versus 55 degrees). There was a trend towards increased ERO of the right shoulder in defenseman, although this did not reach statistical significance (65 versus 56 degrees).

**Discussion and Conclusion:** In professional ice hockey players, there is no difference in shoulder ROM and strength between the right and left upper extremity. Any such difference encountered may represent an underlying pathologic entity. In professional ice hockey players, defenseman may have more ERO than forwards.

**Notes:**

9:41am–9:47am

### Anterior Cruciate Ligament Reconstruction with Bone-Patellar Tendon-Bone Autograft Versus Allograft in Young Patients

Alfred Atanda, MD  
 \*Matthew J. Kraeutler, BS  
 Daniel F. O'Brien, BA  
 Christopher C. Dodson, MD  
 Steven B. Cohen, MD  
 Michael G. Ciccotti, MD

**Introduction:** Traditionally, Bone-Patellar Tendon-Bone (BTB) autograft has been the gold standard graft in younger, athletic patients requiring ACL reconstruction. However, donor site morbidity, post-operative patella fracture, and increased operative time have led many surgeons to choose Bone-Patellar Tendon-Bone allografts for their reconstructions. Opponents of allografts feel that slower healing time, decreased strength, and potential for disease transmission makes them undesirable graft choices in athletic patients. The purpose of this study is to evaluate the clinical outcomes, both subjective and objective, of young patients that who have undergone either BTB autograft or allograft reconstructions with a minimum 2-yr follow-up.

**Methods:** Forty patients, age 25 and below at time of surgery, were contacted after being retrospectively identified as patients having an ACL reconstruction with either a BTB allograft or autograft by one senior surgeon. Patients were

administered the Lysholm Knee Scoring Scale and IKDC Subjective Knee Evaluation Form. They then returned for physical examination as well as completion of a single leg hop test and were administered a KT-1000 arthrometer evaluation. Of the 120 patients contacted, there were 7 failures (5.8%) requiring revision, 6 in the allograft group (86%) and 1 in the autograft group (14%). These patients were not included in the study group for postoperative analysis.

**Results:** The average Lysholm scores were 89.0 and 89.56 and the average IKDC scores were 90.8 and 92.1 in the autograft and allograft groups respectively. The differences in the Lysholm scores and the IKDC scores were not significant. The single leg hop and KT-1000 scores were also not significantly different. One autograft patient had a minor motion deficit. Three allograft patients had a grade 1 Lachman and pivot glide. One autograft patient and two allograft patients had mild patellafemoral crepitation. There was no significant difference in anterior knee pain between groups.

**Discussion and Conclusion:** There is no significant difference in patient-rated outcome between ACL reconstructions using BTB autografts versus allografts. However, the overall study group did reveal an increased failure rate requiring revision in the allograft group.

**Notes:**

9:48am–9:54am

### Distal Locking Using an Electromagnetic Field Guided Computer Based Real Time System for Orthopaedic Trauma Patients

Maxwell K. Langfitt, MD  
 \*Riyaz H. Jinnah, MD  
 Jason J. Halvorson, MD  
 Aaron T. Scott, MD  
 Beth P. Smith, PhD  
 Gregory B. Russell, MS  
 Anna N. Miller, MD  
 Eben A. Carroll, MD

**Introduction:** Many surgeons utilize a freehand or “perfect circle” technique for placement of distal interlocking screws

during intramedullary nailing. Pitfalls include increased operative time, radiation exposure, and the potential to “miss” the nail. A new electromagnetic field real time system (EFRTS), aims to provide surgeons with an alternative technique for distal interlock placement without radiation exposure. The purpose of this study was to compare the efficacy of distal locking using a freehand technique versus EFRTS.

**Methods:** Forty-eight patients aged 18-86 were prospectively enrolled over a one year period. This cohort included 24 tibia and 24 femur fractures amenable to antegrade intramedullary nailing. Each patient had two distal interlocking screws placed: one utilizing the free-hand method and one utilizing EFRTS. Data analysis compared the freehand method versus the EFRTS on the basis of procedural time and number of interlocking screw misses.

**Results:** EFRTS proved faster than the freehand screw placement technique. This difference was most marked for more junior level residents though it did reach statistical significance for PGY-5 residents. Upper level residents were faster at freehand technique compared to more junior residents, but the two groups were similar in time taken for screw placement with EFRTS. The number of misses was statistically higher with freehand compared to EFRTS.

**Discussion and Conclusion:** The procedure for distal interlocking screw placement can be difficult for those who do not consistently perform intramedullary nailing, resulting in increased operative time, radiation exposure, and interlocking screw misplacement. Our data suggests that EFRTS is faster and involved fewer screw misses for those in orthopedic residency training. This trend was most pronounced for junior level residents but did still reach significance for upper level residents. EFRTS may provide a reliable alternative to standard freehand interlocking screw placement and may reduce procedural time, radiation exposure, and inadvertent interlocking screw misses.

**Notes:**

9:55am–10:01am

## Comparison of Anterior Cruciate Ligament Reconstruction with Bone-Patellar Tendon-Bone Allograft Versus Soft Tissue Allograft in Patients Under Twenty-Five Years Old: A Matched Pair Analysis at a Minimum 2-Year Follow-Up

Loukas Koyonos, MD  
Daniel F. O’Brien, BA  
Matthew J. Kraeutler, BS  
Steven B. Cohen, MD  
Michael G. Ciccotti, MD

**Introduction:** Traditionally, young patients have undergone ACL reconstruction with autograft tissue. For a variety of reasons, including donor sight morbidity, and surgeon preference, in recent years, many young patients are undergoing ACL reconstruction with allograft tissue. Both bone-patellar tendon-bone (BTB) and soft tissue (ST) allografts (i.e. tibialis anterior) are frequently used. While it is known that patients receiving BTB autograft have more anterior knee pain and those receiving soft tissue autograft may have a slightly higher graft failure rate, whether or not there is a difference in outcome between allograft options in young patients has yet to be elucidated. The purpose of this study was to compare patient-rated outcomes between BTB and ST allograft ACL reconstruction in patients under 25 years old.

**Methods:** Forty patients were retrospectively identified as having either a BTB (n=20) or ST allograft (n=20) ACL reconstruction by one of two senior surgeons. Each of the twenty patients in the BTB group was matched to a patient in the ST group based on: age within one year at the time of surgery, 4 inches in height, 20 pounds in weight, and, preoperative activity level. The average ages were 24 and 25 for the BTB and ST groups respectively. Patients were contacted and administered the Lysholm Knee Scoring Scale and IKDC Subjective Knee Evaluation Form. The difference in time from surgery to follow-up was not significant between the two groups (average of 27 months in the BTB group and 34 months in the ST group).

**Results:** The average Lysholm score was 95.6 and 94.5 and the average IKDC score was 92.4 and 89.8 in the BTB and soft tissue groups respectively. The differences in the Lysholm score and the IKDC score were not significant. None of the forty patients required revision surgery.

**Discussion and Conclusion:** There is no significant difference in patient-rated outcome between ACL reconstruction using BTB versus soft tissue allograft at a minimum of two years postoperatively. Future efforts should focus on mid and long-term follow up and well as objective outcomes.

**Notes:**

<b>Thursday, June 21, 2012</b>
<b>Concurrent Session IV — Knee Arthroplasty (Triuna Room)</b>
<b>Moderators: Jack J. McPhilemy, DO Fotios P. Tjoumakaris, MD</b>

9:10am–9:16am
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**Total Joint Arthroplasty in Patients with Prior Cancer**

Joseph A. Karam, MD  
 Ronald Huang, BS  
 John Abraham, MD  
 Javad Parvizi, MD, FRCS

**Introduction:** Cancer has been shown to be a significant risk factor for adverse outcome following surgical procedures. Nevertheless, as cancer treatments improve, an increasing number of total joint arthroplasty (TJA) patients will have a history of, or an active diagnosis of, cancer. The purpose of this study was to determine the effect of various types of cancer on complication rates following TJA

**Methods and Materials:** Following IRB approval, we identified 26,415 primary and revision TJA cases performed at our institution between January 2000 and April 2011. 2,518 patients had a history of malignancy as coded by ICD-9 codes V10.00 through V10.99. 324 patients had an active diagnosis of malignancy at the time of arthroplasty surgery, including 25 patients that had bone metastases. Demographics, comorbid conditions, and postoperative complications were collected using our database. Specifically, we evaluated cardiovascular, neurovascular, pulmonary, renal complications, bleeding, wound problems, venous thromboembolism, and surgical site infection. Logistic regression analyses were performed to

identify relationships between cancer and postoperative complications.

**Results:** The mean ages in the patients with active malignancy, bone metastases, history of cancer, and no cancer history were 67.3, 68.6, 70.1, and 62.9 years and the average BMIs were 28.0, 27.1, 28.8, and 31.8 kg/m<sup>2</sup> respectively. Active malignancy was associated with increased overall complication rate (10.8%), pulmonary complications (1.9%), renal complications (4.2%), and hematoma/seroma formation (1.9%) when compared to patients without active malignancy. Patients with bone metastases also had increased overall complication rate (16.0%), pulmonary complication (4.0%), and hematoma and wound healing complication rate within 90 days postoperatively (8.0%). History of malignancy was only associated with an elevated cardiovascular complication risk (0.5%). Pulmonary embolism risk was not elevated in any of the three groups. Active malignancy was an independent risk factor for postoperative complication.

**Conclusion:** Complication rates following TJA in patients with a history of malignancy are not significantly elevated compared to the general population. However, in patients with active malignancy, pulmonary complications (not related to pulmonary embolus), renal complications, bleeding, and wound problems may pose a problem in the postoperative period.

**Notes:**

9:17am–9:23am
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**The Effect of Preoperative Hemoglobin A1c on Acute Postoperative Complications Following Total Joint Arthroplasty**

Daniel Goldstein, MD  
 \*Joel B. Durinka, MD  
 Jack W. Shilling, MD  
 Nicole Dorchinsky, PA-C  
 Solomon Praveen Samuel, PhD

**Introduction:** Diabetes Mellitus is a well-established risk factor for postoperative complications following total joint arthroplasty (TJA). Hemoglobin A1c (HbA1c) is the gold

standard used to measure the average plasma glucose concentration over the previous three months. The objective of this study was to identify a specific HbA1c at which immediate post-operative complication rates increased following TJA.

**Methods:** HbA1c levels were drawn in the preoperative period 2 months prior to surgery. Complications including deep and superficial wound drainage, urinary tract infection, deep venous thrombosis, pulmonary embolism, infection, blood product transfusion, mental status changes, respiratory distress and urinary catheter reinsertion were documented in the acute postoperative period (time of surgery until discharge to home/rehab). A retrospective chart review was undertaken, and each patient was given a score based on how many of the aforementioned complications ensued following surgery.

**Results:** A total of 118 patients were analyzed retrospectively between 2009-2011. The patients were grouped into four HbA1c ranges (less 6%, 6.1-7%, 7-7.4%, above 7.5%) and an average post-operative complication point score for each group was obtained. A logarithmic regression analysis was performed to evaluate whether there was a correlation between pre-operative HbA1c levels and post-operative complication rates. We found that the average post-operative complication scores increased with increasing HbA1c values. Moreover, we established that an HbA1c of above 7.5% correlated strongly with a higher rate of acute postoperative complications.

**Discussion and Conclusion:** Orthopaedic literature has been in agreement, for sometime, that diabetic patients are at an increased risk for postoperative complications following TJA. Generally, diabetics with an HbA1c less than 7% are considered well controlled, while those with an HbA1c above 8% are uncontrolled. In the present series, patients with HbA1c values greater than 7.5% were found to have a significantly increased risk of post-operative complications following TJA.

**Notes:**

9:24am–9:30am

## Efficacy of 2% Chlorhexidine Gluconate-Impregnated Wipes in Total Joint Arthroplasty

Nicholas J. Farber, BS  
Antonia F. Chen, MD, MBA  
Jody Feigel, MSN, RN  
Brian A. Klatt, MD

**Introduction:** Surgical site infection (SSI) following total joint arthroplasty (TJA) is a rare but devastating complication. Infection rates for total knee arthroplasty (TKA) and total hip arthroplasty (THA) range from 0.39-2.5% and 0.2-2.2%, respectively. Various skin antiseptic applications are used preoperatively to reduce microbial concentrations and prevent SSI. Recent literature has demonstrated the ability of 2% chlorhexidine gluconate (CHG) wipes to reduce microbial content at surgical sites. Therefore, the aim of this study is to investigate the efficacy of CHG wipes to reduce SSIs in TJA patients.

**Methods:** A retrospective cohort analysis of 3715 consecutive patients who underwent primary TJA from 2007-09 was performed. CHG wipes were introduced at our facility on 21 April 2008. We compared the 16 months of cases with CHG wipes to the 16 months prior to the introduction of CHG wipes: one group received CHG wipe intervention immediately prior to surgery (n=1891) and the other group did not (n=1824). A subgroup analysis of SSI incidence in THA and TKA patients was performed. There were 1660 THA patients (845 CHG, 815 no CHG) and 2055 TKA patients (1046 CHG, 1009 no CHG). Exclusion criteria included revision and non-elective TJA.

**Results:** SSI incidence in all patients receiving CHG wipes (1.0%; 18/1891) compared with patients not receiving CHG wipes (1.3%; 24/1824) was not statistically different. THA patients had no difference in SSI between those receiving (1.2%; 10/845) and not receiving CHG wipes (1.5%; 12/815); TKA patients also had no difference in SSI between those receiving (0.8%; 8/1046) and not receiving CHG wipes (1.2%; 12/1009).

**Discussion and Conclusion:** The introduction of CHG-impregnated wipes in the presurgical setting was not associated with a reduced risk of SSI. This study is the largest in the literature to date, and our analysis suggests that CHG wipes in TJA are ineffective as an adjunct skin antiseptic as suggested in smaller studies.

**Notes:**

9:31am–9:37am

### Accelerometer-Based, Portable Navigation Versus Imageless, Large Console Computer Assisted Navigation in Total Knee Arthroplasty: A Comparison of Radiographic Results

Denis Nam, MD  
 \*K. Durham Weeks, MD  
 Benjamin Ricciardi, MD  
 Keith R. Reinhardt, MD  
 Michael B. Cross, MD  
 David J. Mayman, MD

**Introduction:** Computer assisted surgery (CAS) systems have been shown to improve alignment accuracy in total knee arthroplasty (TKA), yet concerns regarding increased costs, operative times, pin sites, and the learning curve associated with CAS techniques have limited its widespread acceptance. The purpose of this study was to compare the alignment accuracy of an accelerometer-based, portable navigation device to a large console, imageless CAS system.

**Methods:** 62 consecutive patients, and a total of 80 knees, received a posterior cruciate substituting TKA using the imageless CAS computer navigation system. Subsequently, 65 consecutive patients, and a total of 80 knees, received a posterior cruciate substituting TKA using the accelerometer-based navigation device to perform both the distal femoral and proximal tibial resections. Postoperatively, standing AP hip-to-ankle radiographs were obtained for each patient, from which the lower extremity mechanical axis, tibial component varus/valgus alignment, and femoral component varus/valgus alignment were digitally measured. The total tourniquet time for each procedure was recorded for both systems.

**Results:** In the accelerometer-based navigation device cohort, 92.5% of patients had an alignment within 3° of a neutral mechanical axis (vs. 86.3% with imageless CAS), 96.2% had a tibial component alignment within 2° of perpendicular to the tibial mechanical axis (vs. 97.5% with imageless CAS), and 94.9% had a femoral component alignment within 2° of perpendicular to the femoral mechanical axis (vs. 92.5% with imageless CAS). The mean tourniquet time in the accelerometer-based navigation device cohort was 48.1 +/- 10.2 minutes, versus 54.1 +/- 10.5 in the imageless CAS cohort.

**Discussion and Conclusion:** Accelerometer-based, portable navigation can provide the same degree of alignment accuracy as large console, imageless CAS system in TKA, while also decreasing operative times. The accelerometer-based navigation device successfully combines the benefits and accuracy of large-console, CAS systems, while providing a level of familiarity with conventional alignment methods.

**Notes:**

9:46am–9:52am

### Tibiofemoral Contact Mechanics Following Unicompartmental Knee Arthroplasty

Thomas J. Heyse, MD  
 Carl W. Imhauser, PhD  
 Scott M. Tucker, MSc  
 Joseph D. Lipman, PhD  
 Timothy M. Wright, PhD  
 Geoffrey H. Westrich, MD

**Introduction:** Major causes for failure of unicompartmental knee arthroplasty (UKA) are component loosening and progression of osteoarthritis on the unreplaced side. Little is known about contact stresses generated in the replaced and remaining compartments. Thus, it was asked how installation of a medial UKA affects tibiofemoral contact mechanics.

**Methods:** Fresh frozen cadaver knee specimens were prepared and mounted in a six degrees-of-freedom robot. Axial load and varus moments of 200N and 7Nm were applied using the robot at 15, 45, and 90° flexion with application of quadriceps and hamstring forces before and after implantation of medial UKA using matched cutting jigs. This simulated the ground reaction force and muscle activity during instances of gait, stair descent and chair rise. A stress transducer was fixed to both compartments measure mean contact stress and contact area.

**Results:** Mean contact stress of 8.3 and 3.0MPa was generated on the medial and lateral compartments of the intact knee, respectively. The contact areas on the medial and lateral compartments of the intact knee were 656 and 388mm<sup>2</sup>, respectively. With UKA, the mean contact stress in the medial

compartment doubled while that of the lateral compartment was reduced five-fold. Following UKA, contact area dropped eight-fold medially and increased by 25% laterally. Varus moments lead to lift-off in the lateral compartment.

**Discussion and Conclusion:** Contact mechanics on both compartments change with medial UKA. Increased medial stress following UKA likely results from the decreased contact area. This may be due to the higher modulus of the insert compared to cartilage, and its relatively flat curvature leading to lateral lift-off with varus moments. These findings may help understand mechanical factors associated with UKA loosening, and with development of lateral compartment osteoarthritis. The results may inform guidelines for implant positioning or design that helps alleviate these problems.

**Notes:**

9:53am–9:59am

## Sonication of Antibiotic Spacers During Two-Stage Revision Joint Arthroplasty

Robert B. Jones, MD  
Kaan S. Irgit, MD  
Michael A. Foltzer, MD  
Thomas R. Bowen, MD  
Charles L. Nelson, MD

**Introduction:** Periprosthetic infection with biofilm-forming organisms is a leading cause of failure and re-infection after two-stage reimplantation. One cause of relapse in these cases may be related to persistent infection. Difficulty often exists in detecting biofilm forming infections, particularly in patients who have received antibiotic treatment. Sonication disrupts the adherent biofilm from explanted metallic implants and has led to higher rates of positive intra-operative cultures. The purpose of this study was to determine whether sonication of antibiotic cement spacers at the time of reimplantation improves the accuracy of intraoperative cultures.

**Methods:** We prospectively followed consecutive patients undergoing two-stage reimplantation for periprosthetic hip or knee infection. Basic demographic data, serologic analysis and co-morbid conditions were recorded for each patient. The results of intra-operative cultures from multiple sites as well

as from the sonicated antibiotic spacer were analyzed. The diagnosis of reinfection was made using the new criteria for diagnosis of periprosthetic infection.

**Results:** Eighteen patients with an average age of 64 +/- 15.3 (range 20-84) were identified for inclusion in this study. The average BMI was 34.5 +/- 9.6 (range 21.4 – 51). Six patients had diabetes mellitus and five patients reported using tobacco. None of the spacers showed significant bacterial growth (> 50 colony forming units, CFUs) after sonication. Four patients showed subtle bacterial growth with < 20 CFUs and three of these patients also had positive intraoperative cultures. One patient with < 20 CFUs and negative intra-operative cultures developed reinfection after reimplantation.

**Discussion and Conclusion:** Sonication of antibiotic spacers after two-stage reimplantation may not increase the sensitivity of intra-operative cultures during reimplantation at the levels previously believed to be significant. Sonication of an antibiotic spacer may release additional antibiotic, inhibiting bacterial growth. Further study is needed to determine if subtle bacterial growth (< 20 CFUs) may be significant during reimplantation.

**Notes:**

10:00am–10:06am

## Articular Surface Design Changes Affect Contact Patterns in Total Knee Arthroplasty

Adam Rana, MD  
Geoffrey H. Westrich, MD  
Timothy M. Wright, PhD  
Susannah Gilbert, MS  
Marcella Elpers, MS

**Introduction:** The impact of design changes intended to improve wear of knee replacements can be assessed from analysis of retrieved implants. We hypothesized changes in bearing surface conformity and tibial post geometry from knee replacement A to its successor, knee replacement B, intended to improve articular contact stresses and decrease anterior tibial post damage would be apparent in wear patterns observed on retrieved tibial inserts.

**Methods:** Sixty knee replacement A (implanted 3/09 - 6/10, explanted 12/10 - 8/11) and 20 knee replacement B (implanted 1/93 - 1/05, explanted 12/93 - 8/05) retrieved polyethylene components were matched based on length of implantation (LOI), BMI, age, radiographic AP and flexion-extension position and indication for revision. Tibial post and articular surfaces were evaluated using the Hood criteria for wear patterns. These patterns included; burnishing, pitting, abrasion, third body debris, delamination, deformity, and scratching (graded on a 0 - 3 scale). A total of 15 quadrants were graded for each retrieved liner.

**Results:** The knee replacement A group average age was 65 (SD+/- 9.9) and the knee replacement B group was 64 (SD+/- 8.7). The average knee replacement A group BMI was 31.4 (SD+/- 6.2) and 29.9 (SD+/- 5.7) for the knee replacement B group. The average knee replacement A LOI was 0.87 (SD+/- 6.4) and 0.83 (SD+/- 0.66) for the knee replacement B group. Radiographic position and indication for revision showed no statistically significant difference between groups. Burnishing was the most prevalent wear pattern identified for both designs followed by scratching and then pitting. The percentage of involved area of wear was greater for the knee replacement A polyethylene than the knee replacement B, most notably at the anterior tibial post.

**Discussion and Conclusion:** Bearing surface design is a major factor that can affect kinematics and contact patterns. Our observations confirm the considerable impact of changes in conformity. This study demonstrates that design modeling in-vitro to minimize contact stresses, especially at the tibial post, is reflected in in-vivo performance.

**Notes:**

## 2012 Scientific Program Abstracts — Friday

(An asterisk (\*) by an author's name indicates the presenter.)

Friday, June 22, 2012

Concurrent Session VII — Sports Medicine/  
Shoulder (*Bellvue Room*)

Moderator: James C. Vailas, MD

8:36am–8:42am

### Predictors of Surgical Treatment in Humeral Shaft Fractures in The Poly- Trauma Patient

Fotios P. Tjoumakaris, MD

Luke Austin, MD

Amy Austin, MD

Sarah Callinan, BS

Alvin Ong, MD

Alexander Axelrad, MD, FACS

**Introduction:** The optimum management of humeral shaft fractures continues to be a challenging orthopaedic dilemma. These challenges are even more vexing in the poly-traumatized patient. The purpose of our investigation was to determine which factors are most predictive of surgical management of humeral shaft fractures in the trauma patient and to define the epidemiologic characteristics of this injury.

**Methods:** At our tertiary trauma center, we retrospectively reviewed (from a prospective trauma registry) a cohort of patients who sustained a humeral shaft fracture between 2005 and 2011 after being admitted as a trauma alert. Age, sex, mechanism of injury, length of stay, classification and quality of fracture (open v. closed), associated injuries, injury severity score, type of treatment received, and mortality were all analyzed as predictors of possible surgical treatment.

**Results:** During this time period, 58 humeral shaft fractures were identified out of a total of 209 humerus fractures (>11,000 patients). The average age of the patients was 44 years and there were 33 males and 26 females. The fractures were classified as high energy in 52 cases (90%) and open in 6

(10%). The average ISS score was 20.3. The average length of stay was 8.8 days. 12 patients died as a result of their injuries (21%). 32 patients received operative treatment of their humeral shaft fractures (55%). Operative treatment consisted of: closed reduction with splinting (7), intramedullary rod (13), plate fixation (9), external fixation (2), and irrigation/debridement with splinting (1). ISS score was the most predictive variable determining operative fixation in this series: patients with a low ISS score were more likely to undergo surgery for their injury, this effect was even greater in the presence of an associated fracture (odds ratio: 3.35).

**Discussion and Conclusion:** Patients admitted to a tertiary trauma center are more likely to undergo surgical treatment for a humeral shaft fracture when their injury severity score is lower and when there are associated fractures. The high mortality rate seen in the trauma patient with humerus fractures likely contributed significantly to this finding, and is worth noting amongst orthopaedists caring for these patients.

**Notes:**

8:43am–8:49am

### Clinical Outcomes After Bilateral ACL Reconstruction

Steven B. Cohen, MD

Leigh-Ann Tu, BA

Alfred Atanda, MD

Paul A. Marchetto, MD

Robert W. Frederick, MD

Michael G. Ciccotti, MD

**Objectives:** Rupture of the Anterior Cruciate Ligament (ACL) can be a devastating injury in young, active patients. Current reconstruction techniques are successful at returning a high percentage of athletes back to previous level of play. However, information is lacking regarding functional outcomes in patients who sustain bilateral ACL tears at different

time points. The purpose of this study was to report functional and clinical outcomes of patients who have undergone bilateral ACL reconstructions.

**Methods:** Twenty-two patients who underwent bilateral ACL reconstructions with a minimum of 12 months follow-up were identified. Demographic information such as age, BMI, level of competition, time between injuries, time between surgeries, and time to full sports return were obtained from the electronic medical record. Clinical and functional outcomes were assessed using the Tegner Activity Scale and International Knee Documentation Committee (IKDC), Lysholm, and Cincinnati scores.

**Results:** The average age of patients at first surgery was 22 years (range 13-51 yrs). The average BMI of patients at first surgery was 26.7. The average time between knee injuries was 3.6 years (range 1 month-16 years). The average time between surgeries was 3.4 years (range 7 months-16 years). Average time to full sports return after first and second reconstructions was 10.5 and 7.5 months, respectively. The average IKDC score was 79.63. The average Lysholm score was 83.67 and the average Tegner Activity score was 9.17 pre-injury and 7.11 at latest follow-up (scale 0-10). The average Cincinnati Knee score was 363.89 (scale 120-420).

**Conclusions:** Patients with bilateral ACL reconstructions are able to return to sports within 11 months after each reconstruction. Although current activity levels are decreased compared to pre-injury levels, several validated assessment tools have shown that functional outcomes are satisfactory.

**Notes:**

8:50am-8:56am

### Humerus Fractures Treated at a Regional Trauma Center: A 6-Year Epidemiologic Study

Luke Austin, MD  
 Fotios P. Tjoumakaris, MD  
 Alexander Axelrad, MD, FACS  
 Sarah Callinan, BS  
 Matthew Pepe, MD  
 Bradford S. Tucker, MD

**Introduction:** There are few reports regarding the epidemiology of humerus fractures in the trauma population. Injury

severity, associated injuries, and mortality outcomes are important parameters to consider for the orthopaedic surgeon. The purpose of this investigation was to outline these epidemiologic criteria at our tertiary level trauma center.

**Methods:** All patients admitted through the trauma service from 2005-2011 were entered into a prospective database. We obtained data on age, sex, MOI, presence and location of humerus fracture, associated injuries, mortality, ISS, treatment, and length of stay.

**Results:** Of the 11,007 trauma patients admitted, 209 had a humerus fracture (1.9%). The mean age was 56.1 years (16-96). There were 96 men (45.9%) with a mean age of 47.4 years, and 113 females (54.1%) with a mean age of 63.6 years. The most common mechanism of injury was motor vehicle crash (37.3%). Fracture location distribution was: proximal (53.2%), shaft (28.1%), distal (15.8%), and segmental (3%). Associated head injury occurred in 96 patients (45.9%), visceral injury in 51 patients (24.4%), and spinal column fracture in 41 patients (19.6%). Associated fractures occurred in 154 patients (73.7%). The three most common fractures were rib (17.2%), femur (9.1%), and pelvis (9.1%). The mean ISS was 17.8. Ninety-six patients (45.9%) underwent an operative procedure on the humerus. Average length of stay was 9.2 days. The mortality rate seen in all trauma patients during this period was 4.5%, 12% among those with humerus fractures, and 21% among those with humeral shaft injuries.

**Discussion and Conclusion:** Humerus fractures in the polytraumatized patient are rare. When they do occur they are often high-energy traumas with multiple associated injuries and a high mortality rate, especially in shaft fractures. Multiple fractures are seen in over 70% of cases and a comprehensive evaluation of the patient is necessary.

**Notes:**

8:57am–9:03am

## The Effect of Double Row Versus Single Row Rotator Cuff Repair on the Restoration of Shoulder Motion, Strength and Function: A Prospective Randomized Double-Blind Trial

Stephen J. Nicholas, MD  
Michael J. Mullaney, DPT  
Steven J. Lee, MD  
Christopher D. Johnson, MPT  
Malachy P. McHugh, PhD

**Introduction:** The purpose of this study was to determine if the restoration of shoulder function, motion and strength after rotator cuff repair was dependent on the type of repair (single row vs. double row).

**Methods:** 36 patients were randomized to have arthroscopic rotator cuff repair using a single row technique (13 men, 8 women) or double row technique (11 men, 4 women). The Simple Shoulder Test (SST), Penn shoulder score, and ASES shoulder score were recorded pre- and postoperatively (mean of 20 mo post-op, range 6-51 mo). Shoulder motion (flexion, external rotation, internal rotation), and strength (hand held dynamometer for empty can, full can, abduction, external rotation) were recorded pre- and postoperatively. Effect of repair technique was assessed using mixed model ANOVA with Bonferroni corrections on pairwise comparisons.

**Results:** Improvements in function were similar for patients with single versus double row repairs ( $P=0.56-0.91$ ; post-op SST 10.9 vs. 11.3, Penn 85 vs. 90, ASES 90 vs. 85). Preoperative shoulder motion was not different between groups but at follow-up external rotation motion patients was greater in patients with single versus double row repairs ( $68\pm 11^\circ$  vs  $57\pm 9^\circ$ ,  $P=0.01$ ). Shoulder strength improved from pre-op to post-op for all strength tests ( $P=0.0001$ ), with similar effects between patients with single versus double row repairs (% improvement single row vs. double row: empty can 47% vs. 37%,  $P=0.97$ ; full can 58% vs. 41%,  $P=0.56$ ; abduction 58% vs. 41%,  $P=0.59$ ; external rotation 29% vs. 40%,  $P=0.47$ ).

**Discussion and Conclusion:** Arthroscopic rotator cuff repair resulted in marked improvements in function and strength regardless of whether a single or double row technique was used. A significant loss of external rotation motion was noted in patients with double row repairs but this did not impact strength or function.

**Notes:**

9:04am–9:10am

*Resident/Fellow Travel Grant Award Winner*

## Functional Outcome After Total Shoulder Arthroplasty in the Obese Patient Population: A Prospective Study with Greater than 2 Years of Follow Up

Xinning Li, MD  
Philip Williams, MD  
Andromahi Trivellas, BS  
Edward V. Craig, MD, MPH  
Russell F. Warren, MD  
Lawrence Gulotta, MD

**Introduction:** There is a high prevalence of obesity in the United States and the numbers are increasing. These patients comprise a significant portion of the shoulder arthroplasty patient population. There are several reports of outcomes in the literature on obesity patients after total knee or hip replacement, however, this data is lacking in the shoulder arthroplasty patient population. The purpose of this study is to compare the functional outcomes and complications of obese patients undergoing shoulder arthroplasty with the non-obese population.

**Methods:** Between 2009 to 2010, 77 patients that had a primary total shoulder replacement were grouped according to their Body Mass Index (BMI) and followed prospectively for 2 years. The groups were divided as normal (BMI 30 BMI,  $N=25$ ). Preoperative demographics, age, comorbidities and postoperative complications were recorded. ASES, SF-36 Physical Component (PC) scores, and VAS were evaluated at the 0 and 2 year time period. Statistical analyses were performed.

**Results:** In the normal BMI group; average ASES scores improved from  $38.4 \pm 15.5$  (pre-op) to  $80.2 \pm 19.4$  (2yr), SF-36 Physical Component (PC) scores improved from  $38.3 \pm 6.5$  (pre-op) to  $53.7 \pm 11.3$  (2yr), and VAS decreased from 62 to 12 (2yr). In the overweight BMI group; average ASES scores improved from  $37.4 \pm 18.1$  (pre-op) to  $75.2 \pm 24.9$  (2yr), SF-36 Physical Component (PC) scores improved from  $36.1 \pm 8.0$  (pre-op) to  $39.8 \pm 12.2$  (2yr), and VAS decreased from 68 to 18. In the obese BMI group; average ASES scores improved from  $35.8 \pm 12.5$  (pre-op) to  $80.0 \pm 20.6$  (2yr), SF-36 Physical Component (PC) scores improved from  $36.3 \pm 8.4$  (pre-op) to  $40.7 \pm 12.4$  (2yr), and VAS decreased from 66 to 11 (2yr). There was one deep infection in

the overweight group that required a surgical irrigation and debridement.

**Discussion and Conclusion:** Shoulder arthroplasty in all three groups were associated with significant improvements in ASES scores and decrease in overall pain. Obese and overweight patients after TSA had less overall physical function improvements compared to the normal BMI group. Complications were minimal after TSA in all three patient groups.

**Notes:**

9:20am–9:26am

### Inter- and Intraobserver Reliability of Radiographic Diagnosis and Treatment of Acromioclavicular Joint Separations

Matthew J. Kraeutler, BS  
 \*Bradford S. Tucker, MD  
 Gerald R. Williams, MD  
 Joshua S. Dines, MD  
 Steven B. Cohen, MD  
 Christopher C. Dodson, MD

**Introduction:** The surgical management of acromioclavicular joint separations remains unclear. The purpose of this study was to investigate the decision-making of fellowship-trained shoulder surgeons when presented with the same group of cases.

**Methods:** We retrospectively identified 28 patients who were diagnosed with a type III, IV or V AC joint separation. Some of these patients underwent AC joint reconstructive surgery while the rest continued with nonoperative treatment. A powerpoint presentation was compiled which contained one anteroposterior radiograph and one axial radiograph from each patient prior to treatment. The radiographs were sent to a group of surgeons who were asked to 1) diagnose each injury according to the Rockwood classification and 2) state whether they would recommend operative or nonoperative treatment for each patient. Inter- and intraobserver reliability were calculated from the surgeons' review.

**Results:** Repeat diagnoses were returned by eight surgeons, including one from outside our institution. A single measure

intraclass correlation coefficient (ICC) was used to determine interobserver reliability for the surgeons' Rockwood classifications (ICC = 0.602) and their decision to operate (ICC = 0.469). Intraobserver reliability was calculated for Rockwood classifications ( $\rho = 0.694$ ) and decision to operate ( $\kappa = 0.366$ ). Two of the eight surgeons (25%) stated they would use both open and arthroscopic techniques for repairing the dislocations while the rest (75%) exclusively would have performed open techniques.

**Discussion and Conclusion:** From inter- and intraobserver reliability values, we believe that individual surgeons are consistent in their grading of AC joint dislocations but there is not as much agreement between surgeons. Low reliability values for the decision to operate show that this decision depends on more than radiographic assessment.

**Notes:**

9:27am–9:33am

### Arthroscopic Treatment of Internal Rotation Contracture and Glenohumeral Dysplasia in Brachial Plexus Birth Palsy

Joshua M. Abzug, MD  
 Alexis Williams, BS  
 Dan A. Zlotolow, MD  
 Gerald R. Williams, MD  
 Scott H. Kozin, MD

**Introduction:** The purpose of this study was to report on the one and three year radiographic and clinical outcomes of children who underwent arthroscopic anterior release, with or without tendon transfer, to maintain shoulder joint alignment in children with brachial plexus birth palsy (BPBP).

**Methods:** Forty-four patients who underwent arthroscopic release, with or without tendon transfers, for glenohumeral dysplasia in children with BPBP were prospectively followed for a minimum of three years. Clinical data included active abduction, external rotation, and Mallet scores. MRI data included the amount of retroversion and the percentage of the humeral head anterior to the middle of the glenoid fossa (PHHA). All data points were collected pre-operatively, and at one and three years post-operatively.

**Results:** Retroversion improved from  $-34^{\circ}$  pre-operatively to  $-19^{\circ}$  at one year and  $-14^{\circ}$  at three years. PHHA improved from 19% pre-operatively to 33% at one year and 36% at three years. Passive external rotation improved from  $-26^{\circ}$  preoperatively to  $48^{\circ}$  at one year, and  $49^{\circ}$  at three years. Active abduction improved from  $112^{\circ}$  preoperatively to  $130^{\circ}$  at one year and  $132^{\circ}$  at three years. Individual Mallet components were significantly improved for external rotation, hand to neck, and hand to mouth when comparing preoperative scores to those at one and three years.

**Discussion and Conclusion:** Arthroscopic anterior release, with or without tendon transfers, results in improved glenohumeral alignment and joint remodeling. The positive post-operative outcomes found at one year were successfully maintained at 3 year follow-up. We believe that prompt recognition, timely diagnosis, and early surgical intervention results in a better aligned joint and superior function. Arthroscopic release is easier in the young child with less deformity compared to an older shoulder with severe joint subluxation and glenoid retroversion. In addition, less subscapularis release is required to obtain joint reduction, which preserves midline function.

**Notes:**

9:34am–9:40am

## Evaluation of Information Available on the Internet Regarding Anterior Cruciate Ligament Reconstruction

Ian C. Duncan, MD  
Patrick W. Kane, MD  
Kevin A. Lawson, BS  
Michael G. Ciccotti, MD  
Steven B. Cohen, MD  
Christopher C. Dodson, MD

**Introduction:** Searching the internet is one of the most popular methods for acquiring information related to health. For many patients this information helps formulate decisions related to their health care. Unfortunately, internet websites have no regulatory body monitoring quality and accuracy, potentially leading to incorrect or outdated resources. The purpose of this investigation was to identify authorship, content,

and quality of information available on the internet concerning ACL reconstruction.

**Methods:** The four most commonly used search engines were used to search for ACL reconstruction. The top 50 websites, excluding advertisements and duplicates, were identified from each engine and looked at for authorship and content. Website content was evaluated for method of contact; peer-reviewed references; and discussion of the disorder, technique, complications, eligibility, other treatment options, and specific claims.

**Results:** The majority of internet sites reviewed were authored by private medical sources (36%). 23% of sites were from academic institutions, 20% were public educational sites, and 5% were industry sponsored. Greater than 60% of websites contained a discussion on the disorder and surgical technique. Only a small minority (1.5%) made misleading claims of painless/bloodless surgery and guaranteed return to sport. However, only 26% of the information came from peer-reviewed sources.

**Discussion and Conclusion:** Comparing our results to similar studies in arthroplasty, spine, and hand there is higher quality information available to patients searching “ACL reconstruction.” There are less industry sponsored websites, a higher percentage of peer-reviewed sources, and a lower percentage of misleading claims. Despite a majority of websites discussing ACL ruptures and treatment options, only 25% reference peer-reviewed articles. Fortunately, only a small minority (1.5%) of websites contained false claims. The internet can be a valuable asset for educating patients, but physicians should be familiar with which websites contain high-quality information, so we can guide patients to the appropriate resources.

**Notes:**

9:41am–9:47am

## High School Wrestling: Return to Match

Jeremie Michael Axe, MD  
Michael James Axe, MD

**Introduction:** While prevention of traumatic and overuse sports injuries is at the forefront of sports awareness, cata-

strophic injuries still dominate the concerns of the medical teams covering sporting events. Coordinated staffing of large tournaments is even more demanding. Insights gained from years of experience by the same medical team for one of high schools premier ranked wrestling tournaments offers practical knowledge for successful preparation of a large scale event. Necessary equipment and supplies are critical. This study is designed to aid in safe coverage of a large scale wrestling tournament and to provide information for transfer to other sporting tournaments.

**Methods:** Event preparation was performed and results recorded by the same medical staff for the 3 years, 2006, 2008 and 2009. Skin checks were performed on over 2400 wrestlers, and more than 5000 bouts were supervised by the medical personnel. Medical disqualifications, all injuries, tape use and supplies were recorded.

**Results:** All wrestlers presented appropriate skin forms. Only in 2009, did a wrestler not have adequate treatment for MRSA impetigo and was disqualified. There were no catastrophic injuries in the recorded years. Medical disqualifications were also infrequent. In 2006, 2008 and 2009, 6, 17, and 18 disqualifications occurred respectively. The most common type of injury was a sprain or strain of the knee or shoulder.

**Discussion and Conclusion:** Many clinicians are asked but are fearful of leading the medical staff for tournaments of such size. The presented recommendations provide an understanding and categorical check list of necessary staffing, logistics, equipment and supplies. A mentoring program and preparation for known sports specific anticipated injuries and our mat-side return to play decision making guidelines have helped, but only successful completion of the event provides necessary confidence.

**Notes:**

9:48am–9:54am

## Normal Aging Predisposes to Gastrocnemius-Achilles Muscle-Tendon Unit Pathology by Altering In Vivo Passive Biomechanical Properties in the Rat

Johannes F. Plate, MD  
Walter F. Wiggins, BS  
Patrick Haubruck, BS  
Aaron T. Scott, MD  
Katherine R. Saul, PhD  
Sandeep Mannava, MD

**Introduction:** Achilles tendon (AT) pathology is common in middle-aged individuals; ruptures often occur during high impact sports in males who occasionally participate in sports. The study hypothesized that structural changes of the gastrocnemius-Achilles (GC-AT) muscle-tendon unit during aging alter passive biomechanical properties that predispose middle-aged individuals to Achilles tendinopathy or tendon rupture.

**Methods:** This study characterized the passive biomechanical properties of the GC-AT in 6 young (8 months, approximately 18 human years) and 6 middle-aged (24 months, approximately 52 human years) F344xBN hybrid rats. Animals were placed on a linear translating stage and the GC-AT was attached to a force transducer. In vivo load-relaxation testing was performed, and stiffness and Young's modulus were calculated by linear regression analysis. Fung's quasilinear viscoelastic (QLV) model analyzed history and time-dependent properties.

**Results:** GC-AT stiffness increased significantly by 28% at peak tensions in middle-aged rats (2.7 +/- 0.2 N/mm) compared to young rats (1.9 +/- 0.2 N/mm). Fung's QLV revealed similar time-dependent viscous GC-AT properties (C, tau1, tau2). The product of elastic parameters (A and B) describes the linear component of the increase in tension with increasing degrees of displacement and was significantly increased by 50% in middle-aged rats.

**Discussion and Conclusion:** This study revealed that middle-aged rats reach peak tensions at lower initial displacement than young rats. As high tensions are placed on the AT during impact sports on an already pre-tensioned tendon, middle-aged individuals may experience peak tensions of the GC-AT that are increased disproportionately with increasing displacement compared to a younger population leading to higher rates of microtears with increasing age. These findings provide a

possible pathomechanism for the increased risk of Achilles tendinopathy or rupture in middle-aged individuals based on changes in passive biomechanical GC-AT properties.

**Notes:**

**Friday, June 22, 2012**

**Concurrent Session VIII — General/Basic Science  
(Triuna Room)**

**Moderator: Edward R. McDevitt, MD**

8:31am–8:37am

**Founders' Award Winner**

**New Formulation of Demineralized Bone Matrix Putty Performs Substantially Equivalent to Iliac Bone Graft in Rabbit Posterolateral Lumbar Spine Arthrodesis**

Paul D. Kiely, MCh, FRCS (Tr&Orth)  
Antonio. Breceovich  
Fadi Taher, MD  
Celeste Abjornson, PhD  
Frank P. Cammisa Jr., MD

**Introduction:** Autogenous iliac crest bone graft (ABG) has long been considered the standard for grafting as it possesses the three fundamental components: osteoconductivity, osteoinductivity, and osteogenic potential. Many new bone graft substitutes (BGS) have been developed over the past two decades as alternatives to autograft for posterolateral spine fusion with varying results. Demineralized bone matrix (DBM) is one class BGS that is derived from processed human bone and is mixed with a carrier material to enhance handling characteristics, while maintaining its osteoconductive and osteoinductive potential. The objective of our study was to compare the efficacy of a new formulation of DBM putty to that of ABG.

**Materials and Methods:** Twenty four (24) male New Zealand White (NZW) rabbits, weight range at the start of the study 3.5-4.0 kg, underwent bilateral posterolateral spine arthrodesis of the L5- L6 intertransverse processes, using either ABG (control group, n= 12) or DBM (DBM made from

rabbit bone) putty (test group, n=12). The animals were killed 12 weeks after surgery and the lumbar spines were excised. Fusion success was evaluated by manual palpation of the motion segment and scoring high-resolution x-rays of the excised spine by the Lenke scale. Further analysis included 4-point bending in flexion, right and left bending, and extension to determine stiffness of fusion mass and micro-computed tomography (micro-CT) imaging to determine bone volume. Finally, undecalcified histologic analysis was performed.

**Results:** Manual palpation by three observers to assess fusion success in the explanted lumbar spines showed successful fusion in 81.8% (9/11) of the test group and 72.7% (8/11) of the control group which were equivalent. Fusion was assessed as solid (Lenke A score) in 10 of the DBM and 9 of the ABG specimens. Biomechanical testing showed no significant difference in stiffness between the control and test groups on flexion, extension, and left lateral and right lateral bend. Bone volume/total volume was greater than 85% in DBM treated fusion masses. Histological evaluation revealed mature fusions with little remains of graft material in the DBM-treated group. The ABG-treated group was less mature with greater areas of graft material still present.

**Conclusion:** The DBM putty proved equivalent to ABG in the posterolateral intertransverse rabbit model, and deserves consideration as an alternative to iliac crest autograft in spinal arthrodesis, avoiding donor site morbidities associated with bone graft harvesting.

**Notes:**

8:38am–8:44am

**Ranawat Award Winner**

**Novel Strategy to Enhance Microfracture Surgery: Use of SDF-1 and Sphingosine in Isolated Cartilaginous Defects**

Noah Chinitz, MD  
Anthony Catanzano, BA  
Neil V. Shah, BS  
Zev Klapholz  
Pasquale Razzano, MS  
Daniel A. Grande, PhD

**Introduction:** After traumatic displacement of a section of articular cartilage, the resultant scar, mainly type I collagen,

is suboptimal to native articular cartilage, primarily type II collagen. Microfracture creates vascular channels to allow for clot to ensure replacement with fibrocartilage. Stromal derived growth factor 1 (SDF) and sphingosine-1-phosphate (S1P) are chemoattractant molecules having associations with cells of the hematopoietic lineage. We hypothesize that SDF and S1P are chemoattractive to mesenchymal stem cells (MSC's), and that SDF and S1P-coated collagen scaffolds can lead to regeneration of hyaline cartilage at the site of cartilaginous defects.

**Methods:** Cell Migration Assay: MSC's were plated onto transwell membranes. The lower chambers contained SDF or S1P, serum-free medium (negative control), and serum (positive control). After incubation, cells that migrated were counted. In-Vivo Cartilage Repair: Collagen scaffolds were coated with SDF and/or S1P using a proprietary process. 40 rats underwent bilateral parapatellar arthrotomy. A 1.6mm circular defect was created down to bleeding bone. In one defect a scaffold was placed, and the contralateral empty lesion served as a local control. Four groups of ten rats were studied: scaffolds containing SDF, S1P, SDF + S1P, or nothing. Five rats in each group were sacrificed at 4 or 8 weeks, and the knees histologically analyzed.

**Results:** Cell assays demonstrated dose dependent chemoattraction, with both molecules homing MSC's. In-vivo results show that compared to controls, both SDF and S1P coated scaffolds result in robust resurfacing of defects with white to hyaline blue smooth surfaces, as confirmed with Safranin-O staining and O'Driscoll score. Control defects displayed fibrous tissue with irregular surfaces.

**Discussion and Conclusion:** There is dose dependent chemoattraction of SDF and S1P on MSC's. We show improved performance of the SDF and S1P scaffolds in augmenting microfracture in rats. This strategy could be incorporated into arthroscopic surgery with microfracture.

**Notes:**

8:45am–8:51am

### Antimicrobial Properties and Elution Kinetics of Linezolid from Polymethylmethacrylate: An In-Vitro Comparative Study

Nimrod Snir, MD  
Shiri Meron-Sudai, PhD  
Ajit J. Deshmukh, MD  
Shmuel Dekel, MD, PhD  
Itzhak Ofek, PhD

**Introduction:** Polymethylmethacrylate (PMMA) or Acrylic bone cement impregnated with antibiotics is widely used in the treatment of osteomyelitis and infected arthroplasties. With the emergence of resistant bacterial strains, linezolid, which is active against gram positive bacteria and towards which resistance has been scarce, have been suggested as alternative. In the present in-vitro study we sought to determine and compare the efficacy and elution kinetics of linezolid from PMMA.

**Methods:** PMMA beads impregnated with linezolid, vancomycin or gentamycin alone and in combinations were placed in suspensions of Vancomycin Resistant Enterococci (VRE), Methicillin Resistant Staphylococcus aureus (MRSA), Klebsiella pneumoniae, Escherichia coli and Staphylococcus epidermidis. The leaching out concentrations of antibiotics and growth inhibitory time (GIT) in days were recorded. Mechanical strength of cement beads was evaluated in accordance to international standard 5833.

**Results:** The GIT of linezolid was significantly longer than that of vancomycin and gentamycin for MRSA, VRE and S. epidermidis. The combination of linezolid with gentamycin and vancomycin significantly increased their GIT compared to that of either antibiotic used alone. Linezolid, either alone or in combination with vancomycin and gentamycin, demonstrated satisfactory elution kinetics and antimicrobial activity in-vitro without compromising mechanical strength of PMMA.

**Discussion and Conclusion:** Combination of linezolid with aminoglycosides could provide longer duration of protection against susceptible organisms. Future research evaluating in-vivo profile of linezolid loaded PMMA in experimental animals is needed before it could be considered for human use.

**Notes:**

8:52am–8:58am

## Dilute Betadine Wash Reduces Hardware Related Bacterial Burden in a Rabbit Knee Infection Model

Mohit Gilotra, MD  
\*Thao P. Nguyen, MD  
David Jaffe, MD  
Robert Sterling, MD

**Introduction:** Acute postoperative arthroplasty infections (<4 weeks post-operative) treated with an incision and lavage, intravenous antibiotics, polyethylene exchange and retention of components have only a 50% success rate. Component explant is commonly necessary for infection eradication. Dilute betadine solution has a significant bactericidal effect with minimal cytotoxic effects on osteoblasts. We hypothesized that dilute betadine wash in addition to antibiotic administration would decrease the bacterial burden when compared to a saline wash with antibiotics in a rabbit knee infection model.

**Methods:** A stainless steel screw with a polyethylene washer was inserted into the lateral femoral condyle in bilateral rabbit knees. All knees were then challenged with 10<sup>6</sup> colony forming units of *Staphylococcus aureus*. After one week, all knees were treated with a polyethylene washer exchange and randomly allocated to a saline or 3.5% betadine wash group. All knees received a single dose of ceftriaxone and the screw was retained. Instrumentation, polyethylene and soft tissue bacterial growth were assessed after 7 days using a standardized quantification technique.

**Results:** Betadine treated knees showed a statistically significant decrease in the bacterial count on the screw. There was also a significant decrease in the bacterial burden on the polyethylene when compared to the saline wash. There was no statistical difference in soft tissue bacterial burden.

**Conclusion:** Dilute betadine wash has a significant bactericidal effect on hardware in this knee infection model. In an acute postoperative arthroplasty infection, betadine wash as a treatment adjunct may improve component survivorship. Future clinical trials are necessary.

**Notes:**

8:59am–9:05am

## Surgical Repair of Gluteus Medius Tendon Tears of the Hip: Results and Technique

G. Dean Harter, MD  
Adam K. Lee, MD

**Introduction:** Greater trochanteric pain has been a source of disability for middle aged and elderly patients. The etiology of this pain is often not well-defined and difficult to treat. Recently, gluteus medius tendon tears have become recognized as an identifiable and treatable source of this problem. The purpose of this study is to describe the technique and to report the results of operative repair of gluteus medius tendon tears.

**Methods:** Ten patients with prolonged lateral hip pain, trendelenberg limp, MRI findings demonstrating full thickness gluteus medial tear and failed conservative management underwent open repair of gluteus medius tendon by a single surgeon at our institution. The procedure was performed in a manner similar to a mini-open repair for a rotator cuff injury. The greater trochanter was prepared to a bleeding bony bed, and the tendon was debrided, mobilized and reattached to its footprint with bioabsorbable suture anchors.

**Results:** Intraoperatively, full-thickness tears were identified in 8 of 10 patients. Partial thickness tears were seen in the remaining two patients. Two of the 8 full-thickness tears were graded as massive tears (> 5 cm tear size). Preoperative Harris hip scores averaged 40.2 (14-55) and improved in all patients with an average of 92.7 (70-100) postoperatively. The trendelenberg gait improved or resolved in all patients. Results were graded as excellent in 8 patients, good in 1 and fair in 1 patient. No patient had a poor result. The two patients who did not experience an excellent result were both had massive gluteus medius tears.

**Discussion and Conclusion:** Tears of the gluteus medius tendon represent an etiology of greater trochanteric pain syndrome in a subset of patients. Surgical repair is warranted in these patients, and improvement in pain and limp can be expected in most patients.

**Notes:**

9:15am–9:21am

**Resident/Fellow Travel Grant Award Winner****Incidence and Risk Factors for Hospital-Acquired Clostridium Difficile Infection in Orthopaedic Surgery Patients**

Kirk A. Campbell, MD  
 Sapna A. Mehta, MD  
 Michael S. Phillips, MD  
 Joseph A. Bosco, MD

**Introduction:** A retrospective case-control study was conducted to determine hospital-acquired Clostridium difficile infection (HA-CDI) incidence and risk factors in orthopaedic inpatients.

**Methods:** HA-CDI cases were hospitalized at an orthopaedic hospital between January 1, 2008 and December 31, 2010 with positive *C. difficile* toxin assay by PCR or EIA obtained greater than 72 hours (hrs) after admission. Controls were hospitalized during study period, did not have *C. difficile* and were matched by age, ASA score, year and type of surgery; 2 controls for each case were selected. Univariate and multivariate logistic regression estimated odds ratios for potential predictive factors of incident HA-CDI.

**Results:** Forty-six incident cases of HA-CDI were identified. Three cases did not meet inclusion criteria, leaving 43 HA-CDI cases for analysis. Incidence rate was 3 cases per 1000 inpatient surgeries. Among 43 patients with HA-CDI, 61.5% were female, 69.8% were white, 23.3% were diabetic, 65.1% underwent primary orthopedic surgery, 44.2% received antibiotics for surgical prophylaxis alone and 74.4% received a cephalosporin. In univariate analyses, having surgery more than 24hrs after admission (OR =15.7; 95% CI 5.9, 41.9), antibiotic treatment for infection other than *C. difficile* (OR=3.1; 95% CI 1.4, 6.6), post-operative proton pump inhibitor use (OR=1.9; 95% CI 0.9, 4.0) were associated with HA-CDI. Multivariate logistic regression revealed having surgery more than 24hrs after admission was strongly associated with risk of HA-CDI (OR=15; 95% CI 5.3, 42.8).

**Discussion and Conclusion:** Our study controlled for known HA-CDI risk factors such as older age and health status, as well as surgical procedure and antimicrobial use. Multivariate analysis revealed an inpatient hospital stay prior to surgery is strongly associated with developing HA-CDI, likely due to unmeasured patient risk factors and possibly environmental *C.*

*difficile* exposure. Having same day admit orthopedic surgery carries a 15-fold lower risk for developing HA-CDI.

**Notes:**

9:22am–9:28am

**Resident/Fellow Travel Grant Award Winner****Long-Term Results of Cryosurgery for Treatment of Low-Grade Chondrosarcoma**

Morteza Meftah, MD  
 Robert M. Henshaw, MD

**Introduction:** There is limited data regarding outcomes following intra-lesional curettage and cryosurgical treatment of low-grade cartilage tumors of bone (enchondrosarcoma/ chondrosarcoma). This is a retrospective analysis of long-term results of this technique, evaluating oncologic and functional outcomes.

**Methods:** 50 patients (13 males, 37 females) treated with curettage, cryosurgery, and cementation with internal fixation for low-grade chondrosarcomas between June 1983 and October 2006 were identified in a departmental database. Indications for treatment included low grade cartilage tumors with evidence of aggressive behavior (pain, interval enlargement, endosteal scalloping). Treated lesions involved the humerus (15), tibia (5), spine (1), shoulder (3), femur (23), sacrum (1) and pelvis (2). 15 patients were treated with closed circuit cryoprobes while 35 patients were treated with liquid nitrogen (modified Marcove technique). Functional outcome was determined using the Musculoskeletal Tumor Society (MSTS) scale, which was calculated at time of final follow-up. Oncologic outcome was determined by incidence of local or distal tumor relapse.

**Results:** Mean follow-up was  $11.7 \pm 5.4$  years (range 7.5 – 22.5 years). Mean MSTS score was  $27.1 \pm 3.2$  (range 20 – 29). Mean age at index surgery was  $42.3 \pm 18.9$  (range 29.8 – 79 years). There were no complications associated with the use of cryosurgery. Two patients were deceased at the time of this study. There were 5 local recurrences, all in patients with extensive soft-tissue involvement and/or metastatic disease.

Mean time to recurrence was  $1.4 \pm 0.6$  (range 1 – 2.2 years). All 5 patients had been considered for more extensive surgery, but underwent intralesional treatment with cryosurgery due to comorbid conditions or location of tumor. No patients developed metastatic disease in the follow-up period.

**Discussion and Conclusion:** Intra-lesional curettage and cryoablation for low-grade chondrosarcoma in selected patients was safe and effective. Indications for treatment include intra-compartmental lesions without significant soft-tissue expansion.

**Notes:**

9:29am–9:35am

## Effect of Soluble Fillers on the Elution Properties of PMMA Based Bone Cements

John A. Handal, MD  
 Jeffrey Kushner, BS  
 Jacob F. Schulz, MD  
 Benjamin Dratch, BS  
 Simon C.M. Kwok, PhD  
 Solomon P. Samuel, DEng

**Introduction:** PMMA bone cements can serve both as a fracture fixation device and local drug delivery system for chemotherapeutic agents, analgesics, or antibiotics. Adding soluble space fillers to PMMA may improve therapeutic drug elution profile and lower cost. Soluble fillers theoretically dissolve over time, making the bone cement more interconnected and elute the drug at therapeutic concentrations. In this study, the effect of polyethylene glycol (PEG) filler on the elution properties of these three different PMMA cements containing either an ultralow or high initial methotrexate concentration was evaluated.

**Methods:** The bone cements used in this study are a two-component self-curing system containing a powder component (methylmethacrylate polymer and barium sulfate) and a liquid monomer (methylmethacrylate monomer). To prepare elution test specimens, the powder component was mixed with methotrexate (ultralow: 10 mg or high: 100 mg/specimen) and PEG (20 – 50% weight). Cylindrical elution test specimens were

prepared by adding 2 – 2.5 g of this mixture to 1 ml of liquid monomer and molding them in glass vials. The drug elution was then measured up to 720 h.

**Results:** When compared to bone cements without fillers, bone cements containing PEG eluted higher amounts of methotrexate. At the end of 720 h, 60-80% initial methotrexate remained uneluted from the bone cements containing ultralow initial methotrexate and 20% PEG. In case of bone cements containing ultralow initial methotrexate and 50% PEG, 40-55% initial methotrexate remained uneluted. For bone cement specimens that contained initial 100 mg methotrexate and 40% PEG, only less than 10% of the initial methotrexate remained uneluted at the end of 720 h.

**Discussion:** The results showed that both initial methotrexate and soluble filler (PEG) amount added are crucial variables in optimizing drug delivery. Even at ultralow chemotherapy drug doses, soluble fillers proved effective in improving the drug elution profile.

*\*The FDA has not cleared this drug and/or medical device for the use described in the presentation. (Refer to page 52.)*

**Notes:**

9:36am–9:42am

## Resident/Fellow Travel Grant Award Winner

### Organism Profile in Periprosthetic Joint Infection (PJI): Do Infecting Pathogens Differ in Europe Versus the United States?

Hooman Bakhshi  
 Vinay K. Aggarwal, BS  
 Unter Ecker, MD  
 Dan Kendoff, MD  
 Thorsten Gekrke, MD  
 Javad Parvizi, MD, FRCS

**Introduction:** Treatment regimens and success rates for eradication of PJI differ between Europe and the United States. Yet, the infecting microorganism is a strong predictor of treatment success. The purpose of this study was to compare the infecting pathogens causing PJI in the United States and Europe.

**Methods:** Revision joint arthroplasty patients with positive intra-articular cultures taken in the year 2011 were identified at two high-volume infection referral centers. This consisted of 80 joints from Europe (50 hips and 30 knees) and 85 joints from the United States (50 hips and 35 knees). Data collected from electronic records included index joint, date of culture, culture source and medium, intra-operative culture results, antibiotic sensitivity, and duration of culture.

**Results:** The incidence of organisms in Europe vs. the United States was as follows: coagulase-negative Staphylococcus species (50% vs. 19%), Staphylococcus aureus (11% vs. 46%), Streptococcus species (23% vs. 6%), anaerobic (6% vs. 4%), fungal (0% vs. 7%), mycobacterial (0% vs. 4%), polymicrobial (6% vs. 7%), and other organisms (4% vs. 8%). The incidence of methicillin resistant staph species was significantly lower in Europe than in the United States (47% vs. 50% for MRCNS; 22% vs. 41% for MRSA). No significant deviation from overall organism profile occurred when cases were analyzed according to joint (hip or knee). Mean duration of culture was 14 days in Europe and 8.5 days in the United States.

**Discussion:** Our findings show the infecting organisms in PJI differ between Europe and the United States, with higher virulence organisms being more prevalent in the US. Furthermore, the distinct resistance profiles in the two countries may suggest that the difference in surgical algorithms and reported outcomes after treatment can be traced to microorganism pathogenicity.

**Notes:**

9:43am–9:49am

### **A Biomechanical Assessment of the Contact Stress Patterns Across the Tibial Plateau During Simulated Normal Gait and Stair Climb**

Ian Hutchinson, MD  
 Susannah Gilbert, MS  
 Clifford Voigt, MD  
 Tony Chen, PhD  
 Daniel Choi, MS  
 Suzanne A. Maher, PhD  
 Russell F. Warren, MD

**Introduction:** The effect of soft tissue injury on joint kinematics has been well characterized; however the resulting changes

in loading patterns across the articulating surfaces of the joints has not thus far been assessed. The objective of this study was to characterize the loading patterns across the tibial plateau surface of intact cadaveric knees under multidirectional, physiological loads to mimic activities of gait and stair-climbing.

**Methods:** Three human cadaveric knees were tested on a customized knee joint simulator. The simulator was programmed to apply dynamic, physiologic loading profiles to mimic gait and stair climb. The dynamically varying contact stresses across the surface of the tibial plateau were measured using pressure sensors.

**Results:** During walking and stair climbing, the peak contact stresses occurred simultaneously with peak externally applied axial forces (14% and 45% of gait for walking and 19% and 48% of gait for stair climbing). Thus we characterized early and mid-cycle mechanics. For walking, early gait increased forces located centrally on the lateral plateau. Forces on the medial plateau were 60% less and distributed uniformly. In mid cycle, the forces were transferred from the lateral to medial plateau where they were redistributed on a larger surface area. Early stair climb saw an equal distribution of force and contact area across both plateaus. There is a characteristic contact pattern spanning posteromedial to central lateral suggesting an internally rotated axis. In mid cycle, this axis is maintained with some anteriorization across both plateaus and the medial plateau sees higher forces with a relatively smaller contact area.

**Discussion and Conclusion:** We demonstrated a reproducible model for simulating normal gait and stair climb contact mechanics in the knee. Our findings were congruent with known kinematic gait studies allowing use to use this model to study changes in loading patterns from normal to diseased states.

**Notes:**

9:50am–9:56am

## **Are Bilateral Total Joint Replacement Patients at a Higher Risk of Developing Pulmonary Embolism Following Total Hip and Knee Surgery?**

Geoffrey H. Westrich, MD  
Alyssa Yeager, BA

**Introduction:** Despite developments in prophylactic methods, venous thromboembolism continues to be a serious complication following total joint replacement surgery. The new AAOS and ACCP guidelines on preventing pulmonary embolism after total hip arthroplasty (THA) and total knee arthroplasty (TKA) are focused on choosing prophylaxis based on the patient and do not make specific recommendations for bilateral vs. unilateral procedures.

**Methods:** In-patient pulmonary embolism rates were examined for patients undergoing unilateral or bilateral TKA or THA at our institution in 2011. These rates were compared within types of surgery and to rates of pulmonary embolism in past years.

**Results:** Of the 7437 THA and TKA surgeries completed at our institution in 2011, 36 patients suffered from pulmonary embolism (0.48%). The rate of PE for unilateral TKA was 0.61% (20/3239 patients) and for unilateral THA was 0.17% (6/3576). For bilateral TKA, the rate of PE was 1.87% (8/428) and for bilateral THA, the rate was 0.52% (1/194). Using a one-tailed t-test, the difference in PE rates for 2011 between bilateral and unilateral knee replacement were statistically significant ( $p=0.03$ ).

**Discussion and Conclusion:** Despite the fact that patients are being screened before being cleared to undergo bilateral total joint replacement, these patients remain at higher risk for complications, including symptomatic venous thromboembolism.

**Notes:**

## 2012 Scientific Program Abstracts — Saturday

*(An asterisk (\*) by an author's name indicates the presenter.)*

**Saturday, June 23, 2012**

**Concurrent Session XI — Lower Extremity/  
Trauma (Bellvue Room)**

**Moderators: Samir Mehta, MD  
Saqib Rehman, MD**

7:20am–7:26am

### Should They Stay or Go? The Effects of Hospital Transfer on Trauma Patients

Michael Bercik, MD  
\*Fabio Orozco, MD  
Adam G. Miller, MD  
Ronald Huang, BS  
Alvin Ong, MD  
Javad Parvizi, MD, FRCS

**Introduction:** Patients who sustain bony trauma are often transferred from one hospital to another for: familiarity of the patient and physicians at the receiving hospital with one another, the geographic preference of the patient and family, and the availability of services or subspecialty care. Although studies have demonstrated an association between a delay in treatment and adverse outcome following surgery for hip fracture, little has been reported on the consequence of transferring patients to another institution for surgery.

**Purpose:** The purpose of this study was to compare outcomes of hip fracture patients who were admitted to our institution from the emergency room versus those who were transferred from another facility. Our null hypothesis was that there would be no difference in post-operative complications and/or mortality.

**Methods:** We identified 722 consecutive patients who were treated for hip fracture at our institution between January 2000 and December 2010. Average age was 77.5 years and average BMI was 24.0 kg/m<sup>2</sup>. There were 522 females and 202 males. 406 presented to the emergency room and 316 arrived via transfer from another institution. There was a 1.7% in-hos-

pital mortality rate. We collected demographics, comorbidities, and complications, including cardiovascular, GI, pulmonary, renal, vascular, wound and transfusion. Multivariate analysis was performed to assess whether admission source was an independent risk factor for complications and/or mortality.

**Results:** We found no significant difference in the post-operative complications or mortality between these two groups. Also of note, transfer from another institution was not associated with a delay of surgery > forty-eight hours (p = 0.78). Higher age (p=0.003), greater Charlson index (p=0.046) and delay to surgery (p=0.014) were associated with more complications on univariate analysis. Age (p=0.005) and delay (p = 0.011; OR 1.869) were independent predictors of complication on multivariate analysis. Only age (p=0.048) and the presence of complications (p < 0.001) were associated with mortality on univariate analysis.

**Conclusion:** Our results suggest that transfer of a patient from one facility to another does not affect morbidity or mortality, as long as delay in surgery is avoided.

**Notes:**

7:27am–7:33am

### Intra-Articular Psoas Tendon Release Alters Fluid Flow During Hip Arthroscopy

Bryan T. Hanypsiak, MD  
Marc Stoll, PA-C  
Jeffrey M. DeLong, BS  
Michael Gerhardt, MD

**Purpose:** This study attempts to identify whether an intra-articular psoas tendon release allows fluid to track into the retroperitoneal space and also to identify the path through which

it travels. Our hypothesis is that intra-articular psoas tendon release allows fluid to track into the retroperitoneal space.

**Materials and Methods:** 6 hemi pelvis human cadaveric specimens were utilized for this study. 3 specimens underwent a capsulotomy and psoas tendon release, while 3 had only a capsulotomy. Arthroscopy fluid was combined with barium and methylene blue, and fluid was run at 50 mmHg for 2 hours. C-arm images were obtained at 5 minute intervals. A gross dissection was performed at the end of the arthroscopy and the path of fluid flow into the pelvis and throughout the thigh was identified.

**Results:** All 6 specimens showed extravasation of fluid into the pelvis at the 5min mark. Specimens with a psoas tendon release showed an altered pattern of fluid flow. In all three of these specimens, the psoas muscle belly was bright blue, along with the remaining tendon. 2 of the 3 specimens showed tracking of fluid along the vasculature in both directions. The volume of fluid tracking into the pelvis is increased following a psoas release.

**Conclusion:** Arthroscopy fluid rapidly enters the pelvis following the initiation of hip arthroscopy, regardless of the status of the psoas tendon. Release of the psoas tendon allows fluid to diffuse into the psoas muscle and anterior medial thigh, tracking both proximally and distally along the neurovascular structures. The volume of fluid tracking into the pelvis is increased following a psoas release, and the authors recommend that the case conclude immediately following the release.

**Notes:**

7:34am-7:40am

**Resident/Fellow Award Winner**

## **Treatment of Pertrochanteric Fractures (AO/OTA 31-A1 and A2): Long Versus Short Cephalomedullary Nailing**

Kaan S. Irgit, MD  
Zhiyong Hou, MD  
Thomas R. Bowen, MD  
Michelle E. Matzko, PhD  
Cassandra M. Andreychik, BA  
Wade R. Smith

**Introduction:** We hypothesized that there is no clinical difference in outcomes between elderly patients with low energy,

simple or multifragmentary pertrochanteric femur fractures without subtrochanteric extension (AO/OTA 31-A1 and A2) treated with a long versus the short cephalomedullary nail.

**Methods:** The records of 409 patients presenting to a level I trauma center between 2004 and 2009 with pertrochanteric fractures without subtrochanteric extension (AO/OTA 31-A1 and A2) were retrospectively reviewed. Patients treated with implants other than either a long or short cephalomedullary nail were excluded from the study. Patients treated with a single nail design having identical proximal fixation was included. Patient demographics, treatment related variables, and clinical and radiographic outcomes were recorded for each patient.

**Results:** 283 patients qualified for inclusion in this study; 100 patients treated with a short nail (170mm) and 183 with a long nail. All patients were treated with a single nail design having identical proximal fixation. Average age was 79 years (range, 53-102). The average postoperative follow-up was  $37 \pm 2.3$  months (range 12-58 months). There was no significant difference in postoperative mortality rates between the two groups. There was no clinically significant difference in outcomes between patients treated with long nails compared to those treated with short nails. Patients treated with short nails had, on average, shorter operative times (41 vs. 61 minutes,  $p < 0.0001$ ) and decreased blood loss (100ml vs. 135ml,  $p = 0.031$ ). Implant related complications and number of re-operations did not differ between groups. No post-operative fractures occurred distal to the short nail. There were two, late, post-operative fractures occurring in two patients at the distal end of long nails.

**Discussion and Conclusion:** Long nails offer no clinical advantage compared to short nails in the treatment of simple and multifragmentary pertrochanteric femur fractures (AO/OTA 31-A1 and A2) in the elderly.

**Notes:**

7:41am–7:47am

### Cadaveric and Computed Tomographic Anatomy of the Distal Femoral Articular Capsule

Carlos A. Sagebien, MD

\*Matt Werger, MD

Adam Wilson, MD

Jayson P. Bell, MD

Chaim Y. Bar-Eli, BA

**Introduction:** There is little information regarding the insertion of the knee capsule on the distal femur. The purpose of this study is to delineate a 'safe zone' for femoral extracapsular pin placement thus minimizing the risk of secondary septic arthritis.

**Methods:** The capsular anatomy of twenty seven cadaveric knees in extension was studied: 14 by anatomic dissection and 13 by computed tomography arthrogram (CTA). With cadaveric dissection, the relationship of the knee capsule from the proximal pole of the patella and the epicondyles was measured. The same measurements were determined with CTA. Patella length was also determined by CTA. Statistical analysis was performed with linear regression and student's t-test.

**Results:** With dissection, the capsule inserted 52.9mm from the proximal pole of the patella, 18.1mm inferior to the medial epicondyle, and 19.0mm inferior to the lateral epicondyle. By CTA, the capsule inserted 46.9mm from the proximal pole of the patella, 16.2mm inferior to the medial epicondyle, and 15.8mm inferior to the lateral epicondyle. Mean distances were not significantly different by dissection or CTA. Average patella length was 285.8mm. There was a significant correlation between patella length and the proximal capsular insertion ( $r=0.68$ ).

**Discussion and Conclusion:** For extracapsular pin placement, medial-lateral pins should be placed no more than 15.79mm distal to the epicondyles and anterior pins should be placed no less than 46.92mm from the proximal pole of the patella.

**Notes:**

7:48am–7:54am

### Post-Splinting X-Rays of Minimally Displaced Fractures: Good Medicine or Medicolegal?

Sonia Chaudhry, MD

Edward M. DelSole, MD

Kenneth A. Egol, MD

**Introduction:** Many institutions repeat radiographs following splint application even in the case when no manipulation has been performed. The purpose of this study was to evaluate the utility of post-splinting radiographs of acute minimally displaced fractures that do not undergo manipulation. Our hypothesis is that post-splinting radiographs do not demonstrate changes in fracture alignment or impact the management of the patient.

**Methods:** After IRB approval, orthopaedic consults from September 2008 to April 2010 at a level I trauma center were reviewed. Of 2862 consults, 1321 involved acute fractures. Radiographs revealed 342 fractures that were minimally displaced that were splinted without manipulation. Consult notes and radiographs taken in the emergency department, as well as follow-up radiographs, were reviewed to assess ultimate outcome.

**Results:** None of the 204 fractures demonstrated changes in alignment following splint application. Patients were subjected to an average of 10 radiographs (range 4-25) of their extremities. On average, 3 post-splinting radiographs (range 1-10) were performed. The mean time between initial and post-splinting radiographs was 3 hours and 30 minutes (range 9 minutes to 24 hours). The most common injury was fractures about the hand or wrist. These 121 patients waited almost 3 hours for an average of 3 additional post-splinting radiographs, contributing to a total of 9 radiographs performed acutely. ER visits were longer for patients with post-splinting radiographs compared to those without. Follow-up radiographs were available for 82 patients. All fractures demonstrated maintained alignment.

**Conclusions:** Post-splinting radiographs of non- and minimally-displaced fractures that do not undergo manipulation before or during immobilization result in longer waits, additional radiation exposure, and increased healthcare costs without providing helpful information. While certain circumstances may call for additional imaging, the routine performance of post-splinting radiographs should be discouraged.

**Notes:**

7:55am–8:06am

## Time to Surgery for Hip Fractures Using a Trauma Admission Protocol

Brett P. Frykberg, MD  
Anthony J. Bell, MD  
Anna M. Acosta, MD  
Andrew J. Kerwin, MD, FACS  
Michael Suk, MD, JD, MPH, FACS

**Introduction:** There are significant morbidities and mortalities associated with elderly patients presenting with hip fractures. Current guidelines recommend safely getting the patient from the emergency room to the operating room for definitive care in a timely manner. However, safely and effectively attaining medical optimization for surgery within a short time frame presents challenges. To address these challenges a trial protocol for elderly, low energy hip fractures was created. This required all lower energy hip fractures to be admitted to the surgical trauma service for appropriate and expeditious time to surgery. Our hypothesis is that by instituting our surgically focused protocol, we will decrease the time between hospital admission and the definitive procedure.

**Methods:** In October 2009, a trauma surgical protocol was put in place for all low energy hip fractures at our level one academic teaching hospital. IRB approval was obtained to retrospectively review charts on 149 patients admitted up to April 2011. Our control group was established as a “pre-protocol” cohort between 2007 and 2009, meeting the same criteria. Using chart review analysis, we recorded: time between admission and definitive procedure, morbidities, mortality, and consulted services and compared the data between the two groups for analysis.

**Results:** Our study demonstrated significantly lower morbidities, 75% versus 24% in the post-protocol group. We also demonstrated a decreased mean time from admission to surgery, though it did not reach statistical significance. The overall inpatient mortality rate in our study was 6%, with no difference between the two groups.

**Discussion and Conclusion:** Using our trauma admission protocol, we were able to show a significant decrease of morbidities in elderly patients with hip fractures as well as a decreased time from admission to surgery.

**Notes:**

Saturday, June 23, 2012

Concurrent Session XII — Knee (*Triuna Room*)

Moderators: John C. Richmond, MD  
Fotios P. Tjoumakaris, MD

7:20am–7:26am

## Persistence of MSSA and MRSA Among Arthroplasty Patients After Use of a Decolonization Protocol

Carl A. Deirmengian, MD  
Demetri M. Economedes, DO  
Gregory K. Deirmengian, MD

**Introduction:** Little information within the total joint arthroplasty (TJA) population exists about persistent nasal MRSA/MSSA colonization after a decolonization protocol has been used. The purpose of this pilot study is to quantify long-term *S. aureus* persistence in decolonized TJA patients.

**Methods:** Over a two-year period, all patients having TJA by one surgeon were screened for nasal MSSA/MRSA and decolonized. Of 634 patients, 139 had MSSA (15.3%) or MRSA (6.6%) colonization before TJA. Fifty-eight of these patients were retested for MSSA/MRSA colonization. Data collection included age at time of TJA, type of TJA, and time from TJA to repeat testing.

**Results:** Within the MRSA cohort, 4/18 (22.2%) were persistently positive and 14/18 (77.8%) were negative at repeat testing an average of 830.67 days and 521.36 days after TJA, respectively. Average age was 69.3 years. There were 14 primary arthroplasties (6 THAs, 6 TKAs, 2 UKAs) and 4 revision total knee arthroplasties. Within the MSSA cohort, 15/40 (37.5%) were persistently positive and 25/40 (62.5%) were negative at repeat testing an average of 549.14 days and 472.41 days after TJA, respectively. Average age was 67.3 years. There were 40 primary arthroplasties (19 THAs, 18 TKAs, 3 UKAs). One patient converted from MSSA to MRSA while another converted from MRSA to MSSA at repeat testing.

**Discussion and Conclusion:** Though the majority of patients decolonized before surgery remained negative, about 33% had persistent colonization. Patients with continued colonization almost invariably demonstrated unchanged antibiotic sensitivity, suggesting persistent colonization rather than eradication

and repeat colonization. It is unknown whether these patients are at higher risk of hematogenous infection years after surgery, or whether there is benefit to identifying and re-treating to establish eradication. Given the high rate of patients with persistent colonization after a decolonization protocol, there is great importance in understanding the risks within this population.

**Notes:**

7:27am–7:33am

**Trends in Simultaneous Bilateral Total Knee Arthroplasty**

Lazaros Poultsides, MD, PhD  
 Mohammad R. Rasouli, MD  
 Mitchell G. Maltenfort, PhD  
 Javad Parvizi, MD, FRCS  
 Stavros Memtsoudis, MD, PhD  
 Thomas P. Sculco, MD

**Introduction:** Information regarding trends in bilateral TKAs (BTKAs) is needed for a rational allocation of resources, research, and policy-making. This study aims to elucidate trends in simultaneous BTKAs in two high-volume institutions.

**Methods:** Data on prevalence of procedures, demographics, comorbidity, hospital stay, surgical and medical complications, and mortality of patients undergoing simultaneous BTKAs between 2000 to 2009 in two institutions was obtained. Two 5-year periods (2000-2004 and 2005–2009) were created to facilitate trend analysis.

**Results:** Although the absolute number of BTKAs remained almost the same (2406 and 2433, in 2000-2004 and 2005-2009 respectively), the percentages of simultaneous BTKAs as a function of the total number of TKAs decreased by 35% in the latter study period. The proportion of females remained unchanged, whereas a decline of nearly 50% in patients >75 years was observed and a decline in mean age of patients observed over time (65.46 vs. 63.68 years). The average length of stay significantly decreased from 5.7 to 4.5 days. The prevalence of coronary artery (CAD) and diabetes decreased from the first to the

second study period (11% vs. 6.6% for CAD and 10% vs. 8.3% for diabetes), while that of hypertension and hypercholesteremia increased and remained the most prevalent comorbidities (51.8% vs. 55.2% for hypertension and 23.2% vs. 36.9% for hypercholesteremia). The overall complication rate decreased by 50% (1% in 2000-2004 vs. 0.5% in 2005-2009). The rate of PE was relatively unchanged at two study periods at 1.9% vs. 1.8%, respectively. 30-day mortality rate decreased from the first to second study period (0.08% vs. 0.04%, respectively).

**Discussion and Conclusion:** Simultaneous BTKAs in patients older than 75 years and among patients with diabetes and coronary artery disease decreased during the last decade, indicating the desire to follow a more restrictive and selective preoperative screening for potential candidates of simultaneous BTKAs.

**Notes:**

7:34am–7:40am

**The Role of Aquacel Ag Hydrofiber Wound Dressing with Ionic Silver in Reducing Periprosthetic Joint Infection Following Total Joint Arthroplasty**

Jenny Cai, BS  
 Joseph A. Karam, MD  
 Eric B. Smith, MD  
 Javad Parvizi, MD, FRCS  
 Peter F. Sharkey, MD

**Introduction:** Periprosthetic joint infection (PJI) is one of the most challenging complications after total joint arthroplasty (TJA). Among the many efforts invested to prevent the occurrence of PJI, optimization of wound healing and prevention of wound drainage is an important initiative. The Ag hydrofiber dressing is an antimicrobial dressing which has been postulated to support wound healing and possibly reduce the incidence of periprosthetic joint infection (PJI). The objective of this retrospective study was to evaluate the incidence of PJI in patients undergoing TJA at our institution who received an Ag hydrofiber dressing and compare that to the incidence of SSI in patients receiving standard dressing.

**Methods:** The incidence of PJI in 595 consecutive patients who underwent TJA and received postoperative Ag hydrofiber dressing (study group) was compared to 595 consecutive patients who underwent TJA and received a standard dressing (control group). The Ag hydrofiber dressing was applied on the surgical site in the operating room and kept for 5 days postoperatively. Standard dressing application consisted of sterile gauze applied over the incision site in the operating room and secured with adhesive tape. Except for the application of the Ag hydrofiber dressing, there were no significant changes in clinical practice during the study period.

**Results:** The incidence of PJI was considerably higher at 1.7% (10/595) in patients receiving standard gauze dressing compared to 0.7% (4/595) in patients who received the Ag hydrofiber dressing.

**Conclusion:** PJI is a major healthcare concern with mental, physical and monetary burden on affected patients. The Ag hydrofiber dressing appears to be effective in reducing the incidence of PJI by more than 50% in a group of patients undergoing TJA.

**Notes:**

7:41am–7:47am

### The Effects of Knee Arthroscopy Closure in Flexion vs. Extension on the Failure of a Barbed Suture: A Randomized Animal Trial

Praveen Kadimcherla, MD  
Sun J. Kim, MD  
Yossef C. Blum, MD  
David M. Hirsh, MD  
Chris Sambaziotis, MD  
Andrew Lovy Hutchinson

**Background:** Continuous barbed suture is a relatively new suture material that is being used in total knee arthroscopy closure. Few studies are available evaluating the closure of total knee arthroscopy using this new suture material, and none have assessed closure in flexion versus extension. We sought to evaluate the effect of arthroscopy closure with barbed suture in flexion versus extension.

**Methods:** We conducted a biomechanical study using 24 cadaveric pig knees randomly selected into three closure groups of 8 specimens: full extension, 30° flexion, and 60° flexion. After closure, each knee was ranged to 90° and then 120° of flexion, with the number of suture ruptures recorded. Measured outcomes were arthroscopy failure (defined as rupture of at least one suture throw), and number of suture throw ruptures.

**Results:** Arthroscopy closure in full extension had significantly higher rates of failure (3/8) upon flexion to 90 degrees compared to arthroscopy closure in either 30° or 60° flexion (0/16). Upon ranging from 0° to 120°, arthroscopy failure occurred in 62.5% (5/8) of arthroscopies in the full extension group, 12.5% (1/8) in the 30° flexion group and 37.5% (3/8) in the 60° flexion group. However, a significantly greater number of suture throws ruptured among arthroscopy failures in the full extension group compared to the two flexion groups.

**Conclusion:** Knee arthroscopy closure in extension compared to flexion had significantly higher rates of failure when subsequently flexing the knee.

**Notes:**

7:48am–7:54am

### Antibiotic-Loaded Bone Cement in Total Knee Arthroplasty: Is It Cost Effective?

Christina Gutowski, MD  
Benjamin Zmistowski, BS  
Corey Clyde, BS  
Javad Parvizi, MD, FRCS  
Richard Rothman, MD, PhD

**Introduction:** The incidence of periprosthetic joint infection (PJI) following joint arthroplasty continues to rise at an alarming rate, with a treatment cost between \$60,000-\$110,000. Strategies to prevent PJI have included the use of prophylactic antibiotic loaded bone cement (ALBC) in primary arthroplasty. This study aims to investigate the efficacy and cost of prophylactic ALBC in primary TKA.

**Methods:** Antibiotic loaded cement has been used during every primary TKA at our institution since May 2003. Cases of PJI that developed within two years of 4,830 primary TKA

performed between (1/2004-8/2007) and those developed following 3,048 TKAs performed prior to introduction of ALBC (1/2000-1/2003) were identified. To adjust for changes in confounding factors, the incidence of PJI after 3,347 uncemented THA performed prior to ALBC introduction and 4,702 uncemented THA performed after introduction of ALBC were determined. Patient demographics and comorbidities were analyzed. Equal prophylactic efficacy was assumed in financial models for three additional strategies employing different manually-mixed antibiotics (PMMA mixed with tobramycin and vancomycin).

**Results:** No significant differences in patient characteristics between cohorts were identified. The incidence of PJI increased modestly after the introduction of ALBC. However, this increase after TKA was less than the concurrent increase in PJI following THA over the same time points, leading to an adjusted prevention of 16 cases of PJI by use of ALBC. Use of antibiotic loaded cement (\$500 per arthroplasty) is justified if cost of treating a PJI is greater than or equal to \$150,813. Modeled costs of manually mixed ALBC comprised of different antimicrobial agents were significantly less (\$26,507-\$65,653 per case of PJI prevented.)

**Conclusion:** The use of prophylactic ALBC lowers the risk of subsequent PJI. Unfortunately, the use of commercially available ALBC results in a significant cost to prevent a single case of PJI and is not currently justified financially. However, assuming equal efficacy, the cost of manually prepared ALBC is much more justifiable.

*\*The FDA has not cleared this drug and/or medical device for the use described in the presentation. (Refer to page 52.)*

**Notes:**

7:55am-8:06am

### Seasonality of Infection Rates After Total Joint Replacement

Zachary Post, MD  
 \*Alvin Ong, MD  
 Kris E. Radcliff, MD  
 Fabio Orozco, MD

**Introduction:** The correlation between season (fall, winter, summer and spring) and infection rate in surgical patients

is well defined in many specialties. To our knowledge, there is no data in the literature on this phenomenon in patients undergoing total joint arthroplasty. We hypothesized that there would be an increased infection rate in the summer months in patients undergoing elective total joint replacement.

**Methods:** We retrospectively reviewed consecutive patients undergoing elective total knee, total hip, total knee revision, or total hip revision at a single institution during 1 year by a single surgeon. Wound infections were defined as any patient requiring oral antibiotics for cellulitis, readmission for IV antibiotics, any patient taken back to the operating room for I&D or any patient undergoing excisional arthroplasty and placement of cement spacer within 30 days of the initial procedure.

**Results:** A total of 750 patients were identified. 17 patients developed an infection for an overall incidence of 2.2%. The incidence was highest during July (4.5%), August (5.4%), and September (4.3%). There was a statistically significant difference in infection rate according to season: 3 infections occurred in winter (1.5%), 1 in spring (0.5%), 9 occurred in summer (4.7%), and 4 during the fall (2.4%). There was a statistically significant difference in infection rate between summer/fall (3.6%) versus winter/spring (1.0%).

**Discussion and Conclusion:** There is an increase in the incidence of infection during summer months and a decrease in spring for patients undergoing elective total joint replacement or revision. We hypothesize that this difference is related to increased pathogen colonization on both patients and operating room staff during the warmer and more humid months of the year. We recommend increased surveillance as well as more thorough pre-operative sterilization procedures during these warmer months.

**Notes:**

**Saturday, June 23, 2012**

**Concurrent Session XIII — General**  
*(Triuna Room)*

**Moderators: Robert P. Boran Jr., MD**  
**Marc J. Levine, MD**

8:15am–8:21am

## **Anatomic Lateral Ligament Reconstruction in the Ankle: A Hybrid Technique in the Athletic Population**

Christopher D. Murawski  
Niall A. Smyth, MD  
Ashraf M. Fansa, MD  
John G. Kennedy, MD, FRCS (Orth)

**Introduction:** Anatomic and checkrein tenodesis reconstruction techniques have been described as a means of treatment for chronic lateral ligament instability in the ankle. The current article describes a hybrid procedure using the most advanced concepts of both techniques for use when insufficient normal ligament remains to fashion a direct repair of the ATFL. The authors' report the results at a minimum 1-year follow-up of 57 patients who underwent a hybrid anatomic lateral ligament reconstruction technique in the ankle.

**Methods:** Fifty-seven patients underwent a hybrid anatomic lateral ligament reconstruction procedure under the care of the senior author. All patients were assessed preoperatively and postoperatively using the Foot and Ankle Outcome Score (FAOS) and Short Form 12 (SF-12) outcome scores. The mean patient age at the time of surgery was 28 years (range, 17-65 years), including 39 male and 16 female. The mean follow-up time was 32 months (range, 12-47 months).

**Results:** The FAOS score improved from 58 points pre-operatively to 89 points post-operatively ( $p < 0.01$ ). The SF-12 score improved from 48 points prior to surgery to 80 points at final follow-up ( $p < 0.01$ ). All patients achieved mechanical stability at final clinical follow-up; seven patients (12%) demonstrated functional instability. Functional instability was found to significantly influence not returning to sport at the previous level.

**Conclusion:** This hybrid anatomic lateral ligament reconstruction technique using a peroneus longus autograft to substitute the native ATFL provides an alternative to anatomic

reconstruction when direct repair is not possible, while minimizing the concerns associated with checkrein tenodesis procedures.

**Notes:**

8:22am–8:28am

## **NYS Workers' Compensation Medical Treatment Guidelines: Variance Tracking and Guidelines Amendment Program**

John M. Olsewski, MD  
Heather Bennett, JD

**Introduction:** In December of 2010 the New York State Insurance Department drafted Workers' Compensation Medical Treatment Guidelines utilizing input from specialists in fields other than orthopaedic surgery who were representatives of labor unions or medical directors for workers' compensation insurance carriers. These guidelines were subsequently reviewed by the Research and Scientific Affairs Department of the AAOS, and found to be not evidence-based, yet New York State still instituted them.

**Methods:** A process whereby patients can be treated outside these guidelines was developed, requiring a variance request by the treating physician. These variance requests were tracked for a six month consecutive time frame by treating physician, body part treated, insurance carrier involved, type of variance request, results of variance request to develop background material necessary to seek permanent amendment to the Guidelines.

**Results:** 98% of orthopaedic surgeons in New York treat Worker's Compensation patients and these patients comprise between 10 and 30% of the practice for 88% of these surgeons. 85% of New York Orthopaedic surgeons have had these Guidelines directly impact their patient care; 40% have experienced a denial of the ability to schedule a surgery at a hospital, 50% have experienced denial of a protocol that would have been approved by non-Workers' Compensation Carriers, 72% have had a variance request denied, and 21% have had a payment denied.

**Discussion and Conclusion:** This data is now being returned to the Workers' Compensation Board by NYSSOS to show where the Guidelines do not work and to utilize this information to identify areas where the greatest number of Variance requests are issued, and thereby amend the Guidelines. The data will also be shared with all other State Orthopedic Societies in an attempt to prevent the recurrence of such an event.

**Notes:**

8:29am–8:35am

### Predictors of Pulmonary Embolism in Orthopaedic Patient Population

Scott R. Hadley, MD  
 Michael Lee, BS  
 Mary Reid, NP  
 Ezra Dweck, MD  
 David Steiger, MD

**Introduction:** Venous Thromboembolism (VTE) associated death is the most serious complication in orthopaedic surgery. While all orthopaedic patients are considered high risk by the American College of Chest Physicians, it is presently not possible to determine which patients will develop a clinically important thromboembolic event. The purpose of this study was to analyze the risk factors, outcomes and validity of clinical prediction rules for acute pulmonary embolism (PE) in an orthopaedic patient population.

**Methods:** We retrospectively evaluated consecutive patients diagnosed with PE at an orthopaedic hospital from 7/2010 to 12/2011. PE was diagnosed by critical care attendings based on radiographic and clinical parameters. Data collected included demographics, comorbidities, anticoagulation, diagnostic predictors, clinical prediction rules (Geneva Score and Pulmonary Embolism Severity Index (PESI)), and in-hospital outcomes.

**Results:** Over the 18 month period there were 75 PE diagnoses made at our institution and 1 VTE associated death. 61 patients were diagnosed by CT pulmonary angiography, 2 by VQ scan, and 12 based on clinical findings. The average age of patients with PE was 66.4 years, the average BMI was 31.2 and the average time to PE diagnosis after surgery was 4.1

days. Tachycardia (55/75 pts) and hypoxemia (54/75 pts) were the most common presenting symptoms while dyspnea, hypotension, chest pain and EKG changes were seen in less than 30% of all patients. The average PESI was 98.0. Based on Geneva Score, 70 patients (92%) had intermediate risk (4-10 pts), 5 (6.5%) patients had low risk (0-3 pts), and 1 (1.3%) had high risk (> 10 pts) for VTE.

**Discussion and Conclusion:** PE is a major source of morbidity and mortality at our institution. Risk factors include age >65, and BMI >30. Patients with post-operative unexplained tachycardia or hypoxemia should be critically evaluated for PE. Clinical scoring tools such as PESI and Geneva scores may facilitate risk stratification for PE in an orthopaedic patient population.

**Notes:**

8:36am–8:42am

### Surgical Care Improvement Project (SCIP) and Venous Thromboembolism and Surgical Site Infection in Patients Undergoing Total Joint Arthroplasty

Mohammad R. Rasouli, MD  
 Mehrad M. Jaber, BS  
 Aaron Glynn, MD  
 William J. Hozack, MD  
 Javad Parvizi, MD, FRCS

**Introduction:** In 2006, the Surgical Care Improvement Project (SCIP) developed from the Surgical Infection Prevention project. Reduction of surgical site infection (SSI) and venous thromboembolism events (VTE) are 2 main goals of the SCIP. However, no study has investigated association between adherence to the SCIP measures and rate of SSI and VTE in patients undergoing total joint arthroplasty (TJA). The present study therefore was conducted to evaluate effects of the implementation of SCIP on rates of SSI and VTE in our institute.

**Methods:** We retrospectively identified all patients who underwent TJA at our institute between July 2000 to June 2009. All primary and revision procedures, both hips and knees arthroplasties, were included. Patients who had been

admitted for SSI with unknown date of the index surgery or had prior operation on the same joint outside were excluded. Since, the SCIP was implemented in July 2006 in our hospital, patients were assigned to one-year intervals groups from July 2000 to June 2009 based on the surgery date. Deep vein thrombosis (DVT), pulmonary embolism (PE) and SSI rates were compared before and after the SCIP implementation.

**Results:** After the SCIP implementation, marginal but significant reductions were observed in superficial SSI and DVT rates. However, no significant changes were found in the incidence of deep infection and PE. Superficial infections decreased in primary TJAs and increased by year. DVT rate decreased after implementation of SCIP for all types of TJA except for primary knee. Only in primary hips, a reduction in rate of PE was observed.

**Discussion and Conclusion:** Studies on efficacy of the SCIP on reducing SSI and VTE in other surgical fields yielded mixed results. Based on the findings from a single institution it appears that implementing SCIP guidelines can reduce the incidence of SSI and VTE in patients undergoing TJA.

**Notes:**

8:43am–8:49am

### Access to Arthroplasty: The Medicaid Program

Carlos J. Lavernia, MD  
Jesus M. Villa, MD  
Juan S. Contreras, MD

**Introduction:** As many as 15 million more Americans will be eligible for Medicaid nationwide starting in 2014. Our objective was to compare the availability of primary hip and knee arthroplasty to adults in this program.

**Methods:** Every orthopaedic surgeon within a region in Florida was contacted by telephone and presented with a hypothetical patient. This was followed by a request for an appointment at the earliest available date. Each office was contacted twice with an identical script except for insurance status: once with Medicaid and once with private insurance.

**Results:** Of 117 offices contacted, 42 (36%) perform knee arthroplasty and 35 (30%) perform hip arthroplasty. Only six (14.3%) and five (14.3%) offices offered an appointment to patients with Medicaid coverage for knee and hip arthroplasty, respectively. All offices offered an appointment to patients with private insurance. Mean time for knee arthroplasty appointment with Medicaid was 26.6 days ( $\pm 3.5$  SE; range: 20 – 32 days) and for private insurance 9 days ( $\pm 3.5$  SE; range: 1 to 49 days;  $p=0.004$ ). For hip arthroplasty, mean time for appointment with Medicaid was 24 days ( $\pm 4.0$  SE; range: 20 to 28 days) and 12.4 days ( $\pm 1.8$  SE; range: 1 to 55 days) for private insurance.

**Discussion and Conclusion:** Adults with Medicaid have very limited access to total hip and knee arthroplasty within this community. Increasing Medicaid enrollees will clog the practices of the few orthopaedists that accept the insurance and will impair the access to care envisioned by the creators of the program.

**Notes:**

Saturday, June 23, 2012

Concurrent Session XIV — Arthroplasty  
(Bellvue Room)

**Moderators:** David W. Romness, MD  
Amar S. Ranawat, MD

8:15am–8:21am

### Avoiding Complications with Early Diagnosis and Treatment of Clostridium Difficile After Hip and Knee Arthroplasty

Anthony Tokarski, BS  
Joseph A. Karam, MD  
Carl A. Deirmengian, MD  
Benjamin Zmistowski, BS  
Gregory K. Deirmengian, MD

**Introduction:** Clostridium difficile (C. diff) is an antibiotic-associated gastrointestinal infection that causes clinical findings ranging from diarrhea to life-threatening toxic megacolon. Diarrhea occasionally occurs after hip and knee

arthroplasty procedures. The goals of our study were to determine the rate of C. diff in patients with postoperative diarrhea, to establish predictors of C. diff positivity in this patient population, and to explore outcomes in patients with the disease.

**Methods:** It has been our institutional protocol to screen for C. diff in all patients with diarrhea in the postoperative period after joint arthroplasty. We used our institutional database to identify all joint arthroplasty patients with postoperative diarrhea who were routinely tested for C. diff. Medical records were used to calculate the rate of C. diff positivity in this population, to identify predictors of C. diff positivity, and to establish gastrointestinal and joint arthroplasty outcomes.

**Results:** We identified 121 patients with postoperative diarrhea over a 4-year period. 28 (23%) patients tested positive for C. diff and were treated with oral antibiotics. The average time to diagnosis was postoperative day 4.6. The use of multiple and/or standing antibiotics prior to the onset of diarrhea were predictors of C. diff positivity. Change in peripheral white blood cell count from the preoperative period to the onset of diarrhea did not predict C. diff positivity. None of the C. diff positive patients required abdominal surgery or ICU admission. The diagnosis of C. diff did not increase the risk of periprosthetic infection in patients with postoperative diarrhea.

**Discussion and Conclusions:** Given the potential severity of C. diff and its prevalence in patients with postoperative diarrhea, we recommend testing all such patients and immediately treating C. diff positive patients with oral antibiotics. With early diagnosis and treatment, poor gastrointestinal and joint arthroplasty outcomes can be avoided.

**Notes:**

8:22am–8:28am

### Use of Fluoroscopy with Direct Anterior Approach Decreases Variability of Acetabular Component Placement

Ajit J. Deshmukh, MD  
 Parthiv Rathod, MD  
 Jose Rodriguez, MD

**Introduction:** Acetabular cup orientation is an important element of total hip arthroplasty (THA). The purpose of this retro-

spective case-control study was to compare variability of acetabular cup placement between THA performed via Direct Anterior Approach (DAA) with fluoroscopy in supine position and posterior approach (PA) in lateral position without use of fluoroscopy.

**Methods:** Radiographic and clinical records of THAs performed by a single, high volume arthroplasty surgeon at one institution were reviewed. Patients with similar design of uncemented acetabular cup, femoral component and bearing surface were included to form two groups. PA group consisted of 300 THAs performed from May 2006 to June 2009. DAA group consisted of 300 THAs performed from Oct 2009 to Oct 2011 excluding first 100 cases to eliminate the influence of learning curve. Radiographic analysis was done by two independent blinded observers to determine cup inclination and anteversion ( Liaw et al) on standardized, 6 week postoperative, standing anteroposterior pelvic radiographs using Picture Archiving and Communication System software (PACS).

**Results:** Both groups were comparable in terms of age, sex and BMI. Mean inclination in both groups was similar; PA (41.2 degrees; range, 23 to 63) and DAA (40.36 degrees; range, 29 to 51). Mean anteversion was lower in DAA group (13.29 degrees ; range, 6.2 to 32) as compared to PA group (24 degrees; range, 2.3 to 48.8). Variances for cup inclination (49.7 PA vs 19.1 DAA) and anteversion ( 75.1 PA vs 16.1 DAA) were significantly lower in the DAA group as compared to the PA group as per the F- test for equality of variances (p=0.001).

**Discussion:** Acetabular cup placement in PA relies predominantly on internal landmarks. Utilization of fluoroscopy with supine position during DAA THA helps in intraoperative assessment of cup orientation and making adjustments for pelvic tilt, thus resulting in decreased variability.

**Notes:**

8:29am–8:35am

## Oxidative Degradation Is Not a Concern in a First-Generation Annealed Highly Cross-Linked Polyethylene in Young and Active Patients at Ten Years

Danyal H. Nawabi, MD, FRCS(Orth)  
Matin Lendhey, BA  
Morteza Meftah, MD  
Amar S. Ranawat, MD  
Chitranjan S. Ranawat, MD

**Introduction:** Highly cross-linked polyethylene (HXLPE) was introduced in total hip arthroplasty (THA) over a decade ago on the premise that it would reduce polyethylene wear rates. Recent literature shows reduction in wear and osteolysis at medium-term follow-up. Concerns remain regarding oxidative stability and hence wear performance in the long-term, with data particularly lacking in young and active patients. The purpose of this prospective study was to evaluate the wear performance of a first-generation, annealed HXLPE beyond ten years in a cohort of young and active patients.

**Methods:** 91 young and active patients (112 hips) were recruited into this study and followed prospectively. All patients underwent THA using the same cementless system with a 28mm head and a first-generation HXLPE liner (75K Gy gamma irradiation and then annealed). Linear wear rates were calculated digitally using Roman V1.70 software. Radiographs were analyzed for component alignment and osteolysis.

**Results:** At a minimum of ten years follow-up, 62 patients (78 hips) were available for review. The mean age of the patients at the time of surgery was 53 years (35-64). The mean preoperative UCLA score was 8.1 (7-10). At longest follow-up, the steady state wear rate from 1 year onwards was  $0.011 \pm 0.04$  mm/yr. The survivorship for wear-related complications was 100% and we observed no osteolysis.

**Discussion:** This study confirms that a first-generation annealed HXLPE shows excellent wear characteristics at ten years and beyond. Oxidative degradation for this type of HXPLE is not affecting wear rates or causing any wear-related complications. These results are particularly significant as the patients in this study were all young and active.

**Notes:**

8:36am–8:42am

## Pulmonary Embolism After Total Joint Arthroplasty: IVC Filters are Safer than Heparin and Cost-Effective

Ibrahim J. Raphael, MD  
James C. McKenzie, BS  
Javad Parvizi, MD, FRCS  
Matthew S. Austin, MD

**Introduction:** Pulmonary embolism (PE) is a dreaded complication following total joint arthroplasty (TJA). The mainstay of PE treatment relies on therapeutic anticoagulation. However, therapeutic anticoagulation acutely after surgery has been associated with severe complications. Inferior vena cava filters (IVCF) have been used as an alternative or an adjunct to anticoagulation. This retrospective, cohort-based study investigated the different treatment modalities utilized at our institution over a ten-year period. The objective of the study was to evaluate each treatment protocol for its overall clinical efficacy and cost-effectiveness.

**Materials and Methods:** We reviewed over 27,000 TJA performed at our institution during an 11-year period. Using billing codes, we retrospectively identified 295 patients with a documented, symptomatic PE within 90 days of surgery. Patients followed different treatment protocols. In addition to warfarin: patients in group 1 received IVCF with heparin, patients in group 2 received IVCF without heparin, patients in group 3 received heparin alone and those in group 4 didn't receive additional treatment. We evaluated patient factors, location of PE, type of IVCF, hospital billing costs, length of stay and complications.

**Results:** The rate of complications was significantly higher in Group 1 and significantly lower in Group 2. There was no recurrent PE in any group. Groups receiving heparin (1 & 3) stayed in-hospital longer on average than groups that did not receive heparin (2 & 4). The placement of an IVCF did not increase total hospital costs. There were no recorded complications associated with placement or retrieval of IVCF.

**Discussion and Conclusion:** The treatment of symptomatic PE often involves therapeutic anticoagulation. Major complications can occur after anticoagulation in the acute postoperative period after TJA. IVCF use for PE treatment is safer than heparin and more cost-effective after TJA.

**Notes:**

8:43am–8:49am

## Bilateral Total Knee Replacement: Costs and Reimbursement

Jesus M. Villa, MD  
 Carlos J. Lavernia, MD  
 Juan S. Contreras, MD

**Introduction:** The proper timing of bilateral total knee arthroplasty (TKA) in patients with end-stage arthritis of both knees remains controversial. Our objective was to compare hospital expenditures and reimbursement in a cohort of patients that had bilateral total knee arthroplasty (BTKA) either simultaneously, during the same admission, or staged on different admissions.

**Methods:** 598 consecutive TKAs performed by a single surgeon in a single institution were studied. Subjects were stratified into four groups: Simultaneous BTKA (SIM) (n=48), BTKA same admission/1-week apart (1-WK) (n=162), BTKA different admissions (>1-WK) (n=130), and a control unilateral TKA group (UNI) (n=258). Hospital expenditures and reimbursement, length of stay (LOS), discharge disposition, transfusion rates, and complications were compared between groups. ANOVA and Chi-square tests were used. P1-WK had significantly less gross revenue (\$118,128 vs. \$155,788 vs. \$152,702), direct costs (\$22,464 vs. \$25,628 vs. \$25,251); indirect costs (\$5,618 vs. \$9,600 vs. \$8,752); and operating costs (\$28,082 vs. 35,229 vs. 33,957). However, net revenue was significantly lower for SIM compared to >1-WK (\$20,134 vs. \$27,224). Indirect costs between 1-WK and >1-WK were also found significantly different. LOS was significantly different between SIM (2.08 days per knee), 1-WK (4.77d), and >1-WK (4.09d). There were significant differences in percentage of patients discharged home between SIM (16.7%) or 1-WK (10.5%) compared with >1WK (74.6%) or UNI (73.7%). Significantly more patients were also transfused in SIM (70.8%) or 1-WK (72.8%) compared with >1-WK (18.6%) or UNI (18.4%). Complications were not significantly different.

**Discussion and Conclusion:** BTKA performed 1-week apart in the same admission had more hospital expenditures, longest LOS, decreased probability of home discharge, and increased risk of transfusion. Our data suggests that staged BTKA performed >1-week apart on different admissions is associated with lower hospital expenditures and better perioperative outcomes.

**Notes:**

Saturday June 23, 2012

Concurrent Session XVI — Upper Extremity  
 (Bellvue Room)

**Moderators:** David S. Zelouf, MD  
 David J. Bozentka, MD

12:11pm–12:17am

## MMP and TIMP Imbalance in Carpal Tunnel Syndrome

Yvette Ho, MD  
 Jinny Jacob  
 Kevin Kang, MD  
 Jack Choueka, MD

**Introduction:** The disruption of balance in matrix metalloproteinases (MMPs) and tissue inhibitors of metalloproteinases (TIMPs) has been associated with various diseases involving uncontrolled proteolysis of connective tissue matrices such as cancer, fibrosis and arthritis. As the most common pathological finding in carpal tunnel syndrome (CTS) is non-inflammatory fibrosis and thickening of the tenosynovium, our hypothesis was that a localized imbalance of MMPs and TIMPs within the tenosynovium of CTS patients may be involved in the disruption of the tissue and progression of CTS.

**Methods:** Tenosynovial biopsies were obtained from 30 consecutive patients undergoing carpal tunnel release. Total protein was extracted from these specimens and quantified. ELISA was performed on equalized total protein extracts to determine levels of MMPs 1, 2, 3, 9 and TIMPs 1 and 2. Statistical comparisons were performed using ANOVA.

**Results:** In normal tissue, the level of MMP and TIMP is usually maintained in a roughly 1:1 ratio. In all CTS patients, however, levels of MMPs 2 and 3 were markedly increased relative to TIMP 1 and 2, particularly with respect to TIMP 2. The expression of MMPs 1 and 9, however, was insignificant in comparison to MMPs 2 and 3.

**Discussion and Conclusion:** Our findings identify for the first time an imbalance of MMPs and TIMPs within the tenosynovium of CTS patients. Further studies towards elucidation of detailed mechanisms involving this imbalance may help improve therapeutic modulation of CTS as well as contribute to possible nonoperative management of this condition.

**Notes:**

12:18pm–12:24pm

**Resident/Fellow Travel Grant Award Winner**

### Three Dimensional Morphometric Analysis of the Anterior Elbow Capsule

Abdo Bachoura, MD  
Koichi Sasaki, MD  
Andrew S. Deane, PhD  
Srinath Kamini, MD

**Introduction:** The purpose of this study is to quantitatively describe the morphometric aspects of the inner synovial lining of the anterior elbow capsule.

**Methods:** Twenty-two human elbows from eleven cadavers were carefully dissected and the inner synovial attachment of the elbow capsule preserved. The distal humerus and the shape of the inner capsular insertions were digitized using a three-dimensional digitizer. Computer software was used to analyze the data. The horizontal distance along the transepicondylar line (TEL) between the medial epicondyle and the medial edge of the synovial membrane (SM)(A), apex of the SM overlying the coronoid fossa (B), the central SM nadir (C) and the apex of the SM insertion overlying the radial fossa (D) were measured in millimeters. The distance from the lateral epicondyle to the lateral edge of the SM (E) was measured along the TEL in the anteroposterior plane.

**Results:** The cadavers had a mean age of 80.4 years (range 69 to 87 years). There were six male cadavers and five females. Out of the twenty-two distal humeri eleven were right sided and eleven were left sided. The mean dimensions and standard deviations in mm were (A) 23.1±4.1 (B) 31.3±2.7 (C) 40.5±4.0 (D) 44.9±4.5 (E) 6.5±3.1.

**Discussion and Conclusion:** We have presented data on the morphometry of the synovial lining of the anterior elbow capsule. Surgeons performing arthroscopic or open surgery of the elbow may benefit from a detailed description of the capsule. The arthroscopic working volume is less than that assumed with classical descriptions of the attachment of the outer capsular attachment.

**Notes:**

12:25pm–12:31pm

### Anatomic Relationship of the Palmaris Longus and Long Finger Flexor Digitorum Superficialis Tendons to the Ulnar Artery and Median Nerve at the Distal Flexion Crease of the Wrist

James A. Wilkerson, MD  
\*David S. Zelouf, MD  
Ebrahim Paryavi, MD, MPH  
Joshua M. Abzug, MD

**Introduction:** Endoscopic and minimally invasive two-incision carpal tunnel surgeries exploit the space between the ulnar artery (UA) and the median nerve (MN) to release the transverse carpal ligament. A precise understanding of the anatomy is needed to safely perform these procedures, yet the precise spatial relationships of the Palmaris Longus (PL) and Long Finger Flexor Digitorum Superficialis (FDSL) tendons to these structures have not been described.

**Methods:** Thirteen matched pairs of fresh frozen cadaver upper limbs were utilized. Each specimen was dissected sharply with minimal disruption of the soft tissues to initially expose the PL, UA, and MN at the level of the distal wrist flexion crease. Measurements were taken using digital calipers from the UA and MN to the medial and lateral edges of PL and the FDSL. Each measurement was performed 3 times and then averaged. The PL was subsequently reflected proximally to expose the FDSL and analogous measurements were performed.

**Results:** Five female and eight male cadavers were used with all but 1 pair having a PL. The average distance from the medial border of PL to UA was 11.71 mm (std dev 2.74 mm, range 6.20-16.52 mm). The MN was found 1.22 mm (std dev 1.97) lateral to the medial border of PL. The lateral border of PL overlapped with the MN in all specimens. FDSL was 7.43 mm (std dev 2.65, range 2.76-12.10mm) lateral to the UA. The MN was 2.85mm (std dev 2.24) lateral to the medial edge of FDSL and 0.24 mm(std dev 0.46) lateral to the lateral edge of FDSL.

**Conclusion:** The median nerve lies extremely close to the medial edge of palmaris longus. Incisions performed that extend to the lateral border of PL may cause injury to the MN. The ulnar artery lies approximately 11mm medial to the medial edge of PL, thus the interval within 6mm medial of PL is the safest to utilize when performing endoscopic or two

incision CTR. FDSL is a reliable landmark to utilize in patients when no PL is present, but caution is advised as the safe zone is significantly narrower.

**Notes:**

12:37pm–12:43pm

**A Safe Alternative for Carpal Tunnel Injections: Proximal Palmar Entry**

Sekinat Kassim, MD  
 \*Henry Paul Jr., MD  
 Linda I. Suleiman, BS  
 Violeta Gutierrez, BS  
 Kojo Marfo, BS  
 E. Anthony Rankin, MD

**Introduction:** While surgical release of the carpal canal remains the gold standard and has proven superior to steroid injection, corticosteroid injection of the carpal tunnel remains a viable diagnostic and therapeutic option for patients with carpal tunnel syndrome. We define and compare the basal palmar hypothenar approach (palmar injection site) to the carpal tunnel with popular volar distal forearm entry techniques. Additionally, we evaluate the placement accuracy of injecting needles utilizing this approach.

**Methods:** • Twenty-eight wrists from 26 cadavers were used. • The injection site was marked at the intersection 1 cm distal to the distal wrist crease and 1 to 2 mm radial to the hook of the hamate. • A 25gauge, 5/8 inch hypodermic needle was obliquely introduced at a 45° angle to the forearm with the tip distally directed. • 0.05 mL of red latex dye was injected as a localizing aid. • The position of the needle was secured with cyanoacrylate glue. • Layered dissections were performed to localize the needle tip with respect to vital wrist structures (median nerve, palmar cutaneous branch-median n., flexor tendons). • Calipers were used to measure the distance from the needle to the median nerve and its palmar cutaneous branch.

**Results:** Twenty-three of the 28 palmar injections using the palmar injection zone demonstrated dye injection solely within the carpal tunnel without extravasation of dye beyond the borders. One median nerve was punctured utilizing the

technique. Four other "nonfatal" punctures were documented including three superficial flexor tendons and in one instance the hypothenar musculature. The mean distance from the median nerve was 6.44 +/- 4.37 mm. The distance to the palmar cutaneous branch was 18.23 +/- 5.35 mm.

**Conclusion:** The palmar injection site offers a safer alternative to accessing the carpal tunnel and rivals other popular techniques in terms of anatomic accuracy and consistency.

**Notes:**

12:44pm–12:50pm

**Evaluating Return to Play Status and Functional Outcome After Ulnar Collateral Ligament Reconstruction Using a Validated Assessment Tool**

Robert J. Stewart, MS  
 \*Daniel F. O'Brien, BA  
 Alfred Atanda, MD  
 Michael G. Ciccotti, MD

**Introduction:** Injury to the ulnar collateral ligament (UCL) often results in valgus elbow instability requiring reconstruction. Favorable outcomes and successful return to sport after reconstruction have been reported. To our knowledge, no studies exist using a validated tool reporting return to sport based on age, sport played, and position. The aim of this study was to use a validated assessment tool to report functional outcomes and return to play status in athletes undergoing UCL reconstruction.

**Methods:** 36 patients underwent UCL reconstruction between 11/2004 - 7/2009. Minimum follow-up was 2.2 years (avg: 3.7 years). 27 operations were performed by the same surgeon. Either the Docking (N=10) or Modified Jobe techniques (N=26) were used. Parameters including age, sport, position, return to play status, and time to return were obtained. The Kerlan-Jobe Orthopaedic Clinic Shoulder & Elbow Score (KJOC) was administered to assess functional outcome.

**Results:** There were 29 baseball players, 3 wrestlers, 3 javelin throwers, and 1 jujitsu competitor. The average KJOC score was 76. 35 (97%) athletes were able to return to their sport at

an average of 11 months. Athletes age 16-19 returned to their previous level of play 87% of the time; athletes age 20 and older returned 71% of the time. 82% of baseball players returned to the same level vs. 62% of the athletes in other sports. 72% of pitchers returned to their previous level at an average of 12 months; 2 of the 4 position players returned to their previous level at an average of 11 months.

**Discussion and Conclusion:** UCL reconstruction effectively restores elbow valgus stability. Majority of the athletes (97%) returned to their sport within one year. Younger athletes, baseball players, and pitchers returned to their previous level a higher percentage compared to older athletes, non-baseball players, and position players.

**Notes:**

12:51pm–12:57pm

### Upper Extremity Amputation Is a Predictor of Increased Five Year Mortality in Patients on Dialysis

Naiping Michael Xu, MD  
Austin V. Stone, MD  
Ryan W. Patterson, MD  
L. Andrew Koman, MD  
Beth P. Smith, PhD  
Zhongyu J. Li, MD, PhD

**Introduction:** The purpose of this study is to compare the five-year survival rate of dialysis patients requiring an upper extremity amputation to those who did not require such surgery and to analyze whether such an amputation was a prognosticator for increased mortality.

**Methods:** The medical records of 20 consecutive patients with end-stage renal disease who received upper extremity amputations were reviewed. Control patients (n=40) were matched based on age, gender, and duration of dialysis treatment. A Kaplan-Meier survival analysis was performed.

**Results:** The mean survival time after the index surgery for the operative group was 1805 ± 330 days (95% CI: 1158-2453 d), and the mean survival for the control group was 3067 ± 222 days (95% CI: 2633 – 3502 d). Digital brachial indices

were significantly lower in the operative group (p=0.0001). The average number of amputations in the operative group was 3.25 ± 0.69. The probability of death (the event) was statistically greater in the operative group (p=0.0009). The overall five-year survival rates for the operative and non-operative groups were 35% (7/20) and 70% (28/40), respectively.

**Discussion and Conclusion:** The five-year survival rate from the index surgery of the operative group was half that of the non-operative group. Increased mortality may be partially attributed to the poor vascular health of the patient. This analysis may help the orthopaedic surgeon to more effectively counsel patients with end stage renal disease on dialysis about the prognosis associated with an upper extremity amputation.

**Notes:**

12:57pm–1:03pm

### The Efficacy of Splinting and Home Therapy After Injection of Collagenase Clostridium Histolyticum for Dupuytren's Contracture

Heather A. McMahon, BS  
Sidney M. Jacoby, MD  
Randall W. Culp, MD  
Terri M. Skirven  
A. Lee Osterman, MD

**Purpose:** To compare the efficacy of a specific treatment regimen for Dupuytren's induced metacarpophalangeal contractures (MP) and proximal interphalangeal (PIP) joint contractures consisting of injectable collagenase clostridium histolyticum, splinting, and home therapy.

**Methods:** A retrospective chart review of patients treated with collagenase clostridium histolyticum at one center over one year was conducted to compare pre-injection and post-injection MP and PIP contractures. Minimum follow-up was 30 days. All patients received collagenase clostridium histolyticum injection, cord manipulation, dorsal or volar-based customized thermoplastic splints, and home exercise education. Splinting and home therapy were not stringently enforced in order to achieve realistic compliance rates. An independent t-test was used to compare two groups.

**Results:** There were a total of 34 patients with 66 digits: 24 males and 10 females with a mean duration of follow-up of 5.6 months (range: 1-12 months). The mean baseline MP contracture was  $44.7^\circ \pm 22.2$  and the mean baseline PIP contracture was  $50.7^\circ \pm 25.1$ ,  $p=0.311$ . At latest follow-up, mean post-injection MP contracture was  $6.0^\circ \pm 10.5$ , while mean post-injection PIP contracture was  $27.5^\circ \pm 22.34$ ,  $p=0.001$ .

**Conclusion:** Despite the therapeutic regimen of collagenase clostridium histolyticum, splinting, and home therapy, we observed significantly better outcomes in patients treated for MP contractures versus PIP contractures. These findings are consistent with recently published data. Our results suggest that a protocol that emphasizes extension splinting aimed at correcting residual PIP joint contractures as well as exercises addressing oblique retinacular ligament tightness and central slip attenuation, may improve consistently diminished results of PIP contractures compared to MP contractures.

**Notes:**

ing Freedom (OIF/OEF). The non-discriminating effects of this mechanism, often results in both appendicular and axial skeletal injuries. This study sought to determine the incidence and consequence of associated spine fractures on patients with traumatic lower extremity amputation sustained during OIF/OEF.

**Methods:** Data from 300 consecutive combat related lower extremity amputations was retrospectively reviewed and grouped. Group I consisted of amputees with an associated spine fractures, and Group II consisted of amputees without spine fractures. The results of the two groups were compared with regard to initial presentation and final functional outcomes.

**Results:** A total of 226 patients sustained 300 lower extremity amputations. Twenty-nine of these patients had a spine fracture (13%). Group 1 had a higher Injury Severity Score (ISS) than Group 2 (30 vs. 19,  $p$  less than 0.001). Group I patients were also more likely to be admitted to the ICU (86% vs 46%,  $p$  less than 0.001). Furthermore, Group I patients had a significantly higher rate of heterotopic ossification in their residual limbs (82% vs 55%,  $p$  less than 0.005).

**Discussion and Conclusion:** The incidence of spine fractures in combat related amputees is 13%. The results suggest combat related amputees with spine fractures are more likely to sustain severe injuries to other body systems, as indicated by the significantly higher ISS scores and rates of ICU admission. This group also had a significantly higher rate of heterotopic ossification formation, which may be attributable to the greater local and/or systemic injuries sustained by these patients.

**Notes:**

Saturday, June 23, 2012

Concurrent Session XVII — Spine/Pediatrics  
(Triuna Room)

Moderators: Robert V. Dawe, MD  
James T. Guille, MD

12:11pm–12:17pm

Resident/Fellow Travel Grant Award Winner

**Incidence and Morbidity of Concomitant Spine Fractures in Combat Related Amputees**

Adam Bevevino, MD  
Ronald A. Lehman Jr., MD  
Daniel G. Kang, MD  
Scott M. Tintle, MD  
Theodora Dworak, MD  
Benjamin K. Potter, MD

**Introduction:** High-energy blasts are the most frequent cause of combat related amputations in Operations Iraqi and Endur-

12:18pm–12:24pm

**Unilateral Hip Reconstruction in Children with Cerebral Palsy: Predictors for Failure**

Pinak Shukla, MD  
Sarabdeep Mann, BS  
Stuart V. Braun, MD  
Purushottam A. Gholve, MD

**Introduction:** Unilateral hip reconstruction in cerebral palsy patients can be complicated by contralateral subluxation and

ipsilateral failure. We identified predictors for failure following unilateral reconstruction in patients with GMFCS IV-V CP with unilateral hip involvement.

**Methods:** We performed an IRB approved retrospective study on GMFCS IV-V CP patients with unilateral hip reconstruction at a minimum 2-year follow-up. Radiologic data included acetabular index, femoral migration index (FMI), lateral center edge angle (LCE), and pelvic obliquity. The effects of age, gender, pelvic obliquity, scoliosis surgery, and contralateral hip soft tissue release at the index surgery were analyzed for ipsilateral hip failure and contralateral hip subluxation using chi square and t-tests.

**Results:** There were 35 patients (M:F, 23:12) with mean age of 110 months (45- 215) with mean follow-up of 60.5 months (24-129). The mean preoperative ipsilateral hip FMI was 60% (40-100) and the mean LCE was  $-16.7^{\circ}$  ( $-85-17.2^{\circ}$ ). Contralateral soft tissue release was performed in 13/35 patients. Ipsilateral hip failure or contralateral hip subluxation was observed in 51% (18/35) patients. Contralateral hip subluxation developed in 28% (10/35) of patients. Ipsilateral hip failure was observed in 34% (12/35) patients. Four had both ipsilateral failure and contralateral subluxation. Lack of contralateral hip soft tissue release, reversal of pelvic obliquity angle, and high initial contralateral hip FMI ( $>25\%$ ) significantly predicted the risk of contralateral hip subluxation. Similarly, continuance of severe pelvic obliquity significantly predicted ipsilateral hip failure. There was a strong trend towards contralateral hip subluxation in patients below 8 years of age and ipsilateral hip failure in those who had spinal fusion surgery for scoliosis.

**Discussion and Conclusion:** Predictors of contralateral hip subluxation included lack of contralateral soft tissue release, reversal of pelvic obliquity, and larger initial contralateral hip FMI ( $>25\%$ ). The only predictor of ipsilateral failure was continuance of severe pelvic obliquity.

**Notes:**

12:33pm–12:39pm

## Evaluation of Poly-Articular Lyme Disease in the Pediatric Population

Amiethab A. Aiyer, MD  
William Hennrikus, MD  
Jessica Walrath, BS  
Brandt P. Groh, MD  
Barbara E. Ostrov, MD

**Introduction:** Lyme arthritis is confused with acute septic arthritis, particularly in an endemic area. Acute septic arthritis requires urgent surgical drainage and antibiotics; Lyme arthritis is treated with antibiotics alone. Serology testing for Lyme disease is performed twice per week at our lab. Kocher criteria ( $T > 38.5$ ,  $WBC > 12.5$ ,  $ESR > 40$ , inability to walk) were designed to evaluate septic hip arthritis. Caird et.al found that  $T > 38.5$  is most suggestive of septic arthritis. The purpose of this study is to identify an algorithm to differentiate Lyme from septic arthritis, with focus on the ankle joint, in the setting of poly-articular disease. An accurate algorithm will afford prevention of unneeded arthrotomies.

**Methods:** Study approval given by PSU IRB. 41 patients with ankle involvement were identified between 2005 and 2011, from the Pediatric Lyme Registry. Inclusion criteria: age  $< 18$  years old (avg: 9.85), a diagnosis of Lyme disease per the CDC guidelines, and available laboratory information.

**Results:** 39/41 had a positive Western blot for Lyme disease. 13/41 had a positive ELISA. 10/41 had  $WBC > 12,500/mm^3$ . 16/41 had an  $ESR > 40mm/hr$ . 2/41 had isolated ankle involvement. Of 74 patients with poly-articular involvement, 34 had ankle/knee involvement (46%). 32/41 had limited pain with ankle motion (78%). 39 (95.1%) were able to bear weight. 38 (92.7%) were afebrile ( $< 38.5^{\circ}C$ ) on presentation.

**Discussion and Conclusion:** Without rapid availability of Lyme serology, unneeded surgical drainage of painful joints occurs. Our data suggest that patients presenting with 2 or less Kocher criteria, poly-articular disease, ankle involvement and minimal pain with PROM, most likely have Lyme rather than septic arthritis. Patients with presumed Lyme disease can be treated with needle aspiration of the joint, appropriate antibiotics and careful serial exams while waiting for Lyme serology. Presumptive septic arthritis should receive antibiotics/ surgical drainage acutely.

**Notes:**

12:40pm–12:46pm

**Resident/Fellow Award Winner****Pedicle Screw “Hubbing” in the Adult and Immature Thoracic Spine: A Biomechanical and Micro-Computed Tomography Evaluation**

Daniel G. Kang, MD  
 Ronald A. Lehman Jr., MD  
 Adam Bevevino, MD  
 Rachel E. Gaume, BS  
 Haines Paik, MD  
 Anton E. Dmitriev, PhD

**Introduction:** Pedicle screw “hubbing” involves seating the screw head into the dorsal lamina. This technique is postulated to provide 1) a load-sharing effect thereby improving pullout resistance, and 2) a reduction in the moment arm thereby decreasing cephalo-caudad toggling and implant loosening. The purpose of our study was to evaluate pull-out strength (POS) of fixed-head pedicle screws after hubbing versus standard insertion in the adult and immature thoracic spine.

**Methods:** Twenty-six (26) fresh-frozen human cadaveric and 22 fresh-frozen immature calf thoracic vertebrae were prepared. Osteoporotic BMD (n=16), normal BMD (n=6), and immature (n=12) specimens were instrumented with pedicle screws in Group I (non-hubbed, control) and Group II (hubbed) in the opposite pedicle. Cyclic, fatigue loading in a cephalocaudad direction was applied for 2000 cycles at a rate of 1 Hertz (Hz). Pull-out testing was performed in-line with the midline of the vertebra at 0.25 mm/sec and peak POS measured in Newtons (N). Micro-computed tomography (uCT) was used to evaluate trabecular architecture and incidence of iatrogenic microfractures in both adult (n=4) and immature (n=10) specimens.

**Results:** Hubbed screws resulted in significantly lower POS in all specimens (452±274N versus 656±285N), adult specimens (291±142N versus 512±243N), and immature specimens (747±197N versus 922±112N). With the hubbing technique, 50% of all adult specimens, and 83% of non-osteoporotic adult specimens had visible fractures of the dorsal cortex. For immature specimens, the dorsal cortex demonstrated plastic deformation and conformed to the screw head in 88% of cases. No visible fractures occurred in the

control group. uCT demonstrated microfractures of the dorsal cortex in 4/4 adult and 10/10 immature hubbed specimens, and no fractures in 0/4 adult and 1/10 immature control specimens.

**Discussion and Conclusion:** This is the largest cadaveric study ever performed to evaluate this topic. Hubbed pedicle screws have significantly lower pull-out strength in adult and immature thoracic vertebrae, and frequently cause iatrogenic fractures of the dorsal cortex (micro or visible). This study provides the surgeon with vital information to avoid this common misconception with screw insertion.

**Notes:**

12:47pm–12:53pm

**Resident/Fellow Travel Grant Award Winner****Comparison of Long Term (5 YR) Reoperation Rates and Outcomes for Long Fusions to the Sacrum for Adult Deformity: Primary vs. Revision Surgery**

Michael Faloon, MD  
 David A. Essig, MD  
 Thomas B. Ross, RN  
 Matthew E. Cunningham, MD, PhD  
 Bernard A. Rawlins, MD  
 Oheneba Boachie-Adjei, MD

**Background:** Despite improvements in technology and techniques, long fusions from the thoracic spine to the lumbo-sacral pelvis in patients with adult spinal deformity are fraught with complications and the need for reoperation. Complications and reoperation can significantly impact patient health related quality of life. This study aims to compare revision rates & outcomes scores between primary and revision surgeries for patients with adult spinal deformity at 5 years follow-up.

**Methods:** This is a retrospective review of 132 consecutive patients that underwent anterior-posterior spinal fusion from the thoracic spine to the sacropelvis that had complete clinical and radiographic data and a minimum of 5-yrs follow up.

Patients were divided into two groups: primary surgery (PS) & index revision (IR) surgery; pts were then subdivided based on whether or not they returned to OR, (RTO & NRTO). Return to OR complications were grouped according to categories relating to 1. infection 2. neurologic 3. fusion status 4. hardware & 5. global alignment and stratified by early, late 2 yrs, and long term. SRS-22 & ODI scores were compared between subgroups at 5 year follow-up.

**Results:** 134 consecutive pts, 71 PS & 63 RS were included in the analysis. 50 PS & 41 RS cases had complete HRQL and ODI scores with 5 yr minimum f/u; 13 males & 121 females; mean age 56.2(37-74). Mean follow up was 5.5 years (4.8-12.8 years). RO rates were 23.5% & 35.4% respectively for PS and RS. 36.8% of patients requiring reoperation did so on multiple occasions. In the PS group RO rates were for 1. infection (37.5, 33.3, 0%) 2. neurologic (37.5, 16.7, 9%) 3. fusion status (0, 16.7, 9%) 4. hardware (25, 16.7, 72.7%) & 5. global alignment (0, 16.7, 9%) at 6 months, 2years. For RS, RO rates were for 1. infection (45, 0, 16.7%) 2. neurologic (30, 25, 0%) 3. fusion status (0, 25, 50%) 4. hardware (15, 25, 16.7%) & 5. global alignment (10, 25, 16.7%) at 6 months, 2years respectively. 91 patients had complete outcomes measures and were included in the analysis. 12 males, 79 females; mean age at surgery 54.9 yrs (30-78), mean f/u 5.8 yrs (4.8-12.8). There were 50 in the PS group 41 in the IR group. Final SRS-22 total scores were 3.74 and 3.41 ( $p=0.02$ ) for the respective groups. ODI scores were 12.69 & 17 ( $p=0.02$ ).

**Conclusion:** Patients with long fusions to the sacrum had a significant number of revision surgeries performed by 5 yr f/u. In both groups, complications treated at less than 5 yrs tended to be related to infection or neurologic issues, those requiring reoperation at greater than 5 yrs tended to be related to fusion & alignment. Despite better patient reported outcomes, no difference was seen in the reoperation rates between groups. RTO significantly effected ODI & SRS -22 outcomes scores in each of the individual domains at 5 yrs f/u regardless of PS or IR status. No difference was seen between the PS and IR.

**Notes:**

12:54pm–1:00pm

**Resident/Fellow Travel Grant Award Winner**

**Does Preoperative Narcotic Use Persist After Spinal Deformity Surgery? A Comparison of Non-Narcotic and Narcotic Using Groups**

Addisu Mesfin, MD  
Lawrence G. Lenke, MD  
Keith H. Bridwell, MD  
Usman Akhtar  
Jennifer M. Jupitz  
Linda A. Koester

**Introduction:** The role of preop narcotic use and its influence on outcomes following spinal deformity surgery is unknown. Our objectives were to evaluate: 1) if preop narcotic use persists following spinal deformity surgery; 2) if outcomes of spinal deformity are adversely affected by preop narcotic use.

**Methods:** 253 adult patients (230 female/23 male) undergoing primary spinal deformity surgery were enrolled. Preop, 2yr postop and latest f/u pain medication use was collected along with ODI, SRS pain and SRS scores. Preop insurance status was also collected. All patients had a minimum 2 yr f/u (avg 47.4 month).

**Results:** 168 patients (Group NoNarc) were taking no pain meds/NSAIDs only preop. 85 patients (Group Narc) were taking mild/moderate/heavy narcotics preop. Avg age was 48.2 for Group NoNarc and 53.6 for Group Narc ( $p$  less than 0.005). Insurance status (Private/Medicare/Medicaid) was similar between the groups ( $p=0.39$ ). At latest f/u, 137/156 (88%) prior NoNarc pts were still not taking any narcotics while 48/79 (61%) prior Narc pts were now not taking any narcotics ( $p$  less than 0.001). Postop Group NoNarc had significant improvements in ODI (26 to 15.9,  $p$  less than 0.001), SRS pain (3.36 to 3.9,  $p$  less than 0.001) and SRS score (3.36 to 4,  $p$  less than 0.001). Group Narc also had significant improvements in ODI (44 to 29.5,  $p$  less than 0.001), SRS pain (2.3 to 3.38,  $p$  less than 0.001) and SRS score (2.78 to 3.68,  $p$  less than 0.001). A comparison of change in outcome scores between the two groups showed a higher improvement in SRS pain score for Group Narc compared to NoNarc ( $p$  less than 0.001).

**Discussion and Conclusion:** Narcotic use significantly decreases following spinal deformity surgery. All outcome scores significantly improved postop in both groups. However, the Narc group had significantly greater improvement in SRS pain scores compared to the NoNarc group.

**Notes:**



## **Eastern Orthopaedic Association**

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### **Scientific Poster Exhibits**

June 21-23, 2012

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Poster presenters will have an opportunity to report their findings at designated times indicated on the Meeting-at-a-Glance Schedule

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Scientific Posters will be on display during the Scientific Program on Thursday, Friday and Saturday.

Please plan to visit the Scientific Posters.

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## 2012 Poster Abstracts

### Thursday-Saturday

(An asterisk (\*) by an author's name indicates the presenter)

#### Poster 1

### Anti-Emesis After Spine Surgery: Does a Single Pre-Operative Dose of Aprepitant Reduce Nausea and Vomiting?

David T. Anderson, MD  
Timothy DiIorio, MD  
Mark F. Kurd, MD  
Mitchell Mattenfort, MD  
Jeffrey Rihn, MD

**Introduction:** Post-operative nausea and vomiting (PONV) due to anesthetic agents and opioid-based IV patient-controlled analgesia is common following spine surgery. It interferes with early mobilization, hospital discharge, and ultimately causes considerable patient distress. Several anti-emetic agents reduce PONV, but their action is limited by a short half-life. Aprepitant, an FDA-approved anti-emetic utilized in patients receiving chemotherapy, has a much longer half life. We performed a retrospective case control study to evaluate the efficacy of a single pre-operative dose of Aprepitant in reducing PONV.

**Methods:** Between September 2008 and November 2009, 74 patients who received a pre-operative dose of Aprepitant (Study Group) were matched to 61 patients who did not receive a dose (Control Group) from a group of patients undergoing cervical arthrodesis, lumbar arthrodesis, or lumbar decompression. Patient charts were reviewed to identify episodes of nausea and vomiting, number of doses of anti-emetics required for break-thru PONV, number of session with physical therapy, and length of hospital stay.

**Results:** Aprepitant reduced the percentage of patients with PONV (28/74 or 38% of study compared to 39/61 or 64% of control Group;  $p=0.0037$ ). Moderate to severe PONV (3 or more episodes) occurred in 12/74 or 16% of the study group compared to 18/43 or 30% of the control group ( $p=0.095$ ). The average number of episodes of PONV during hospitalization was 1.0 in the study group and 2.1 in the control group ( $p=0.002273$ ). The use of additional anti-emetic doses was reduced from 1.1 in the control group to 0.8 in the study group

( $p=0.7927$ ). The study group completed an average of 5.2 sessions with physical therapy compared to 4.0 sessions in the control group ( $p=0.002841$ ). Hospital length of stay was similar between the groups (2.9 for the study vs. 2.8 for the control group;  $p=0.4715$ ).

**Conclusion:** Our current study suggests a single pre-operative dose of Aprepitant reduces the number of episodes of PONV and the use of additional anti-emetics. It also increased the number of sessions with physical therapy leading to more early mobilization. The use of Aprepitant did not affect the length of hospital stay.

#### Poster 2

### Cost Benefit Analysis of Same Day Pregnancy Tests in Elective Orthopaedic Surgery

Joseph A. Bosco, MD  
Lorraine Hutzler, BA  
Kandy Kraemer, RN, MSN  
Nicola Palmer, RN, MSN  
David B. Albert, MD

**Introduction:** Performing elective surgery on pregnant women can harm the mother and fetus. In order to minimize the likelihood of this happening we administer a urine pregnancy test to each woman of childbearing age on the date of surgery. From November 2009 to September 2011, we performed 4,723 urine human chorionic gonadotropin (hCG) pregnancy tests on the day of surgery. We reviewed the results and cost of each pregnancy test. We then used these results to calculate the percentage of positive tests and the cost of diagnosing each pregnant female on the date of their surgery.

**Methods:** We obtained the records of all urine hCG pregnancy tests performed from November 2009 to September 2011. Each test was reviewed to determine if the result was positive or negative. Costs were calculated using the charges incurred for a qualitative hCG pregnancy test. We then contacted each patient with a positive result to determine if the urine hCG test results were accurate.

**Results:** 4,723 pregnancy tests were reviewed over a 23 month period with 7 (0.15%) having a positive result. Over the 23 month time period we were notified of one false negative result (0.02%). The Positive Predictive Value (PPV) was 100% and the Negative Predictive Value (NPV) was 99.9%. The cost of a single urine hCG test was \$1.49, the total cost for all 4,723 tests was \$7,037.27. The cost of diagnosing 7 positive tests was \$1,005.32.

**Conclusion:** Routinely performing urine hCG pregnancy tests on the day of surgery is a cost effective method of preventing elective orthopaedic surgery on pregnant women. Of 4,723 women tested 7 had a positive result and 1 had a false negative result. The cost of \$1,005.32 for each positive test must be compared with the benefit of not performing elective surgery on a pregnant female.

### Poster 3

## Discharge INR in Patients Managed with Warfarin for DVT Prophylaxis: Are We Really Anti-Coagulating Our Patients?

P. Benjamin Brown, BS  
\*Alvin Ong, MD  
Fabio Orozco, MD  
Zachary Post, MD

**Introduction:** Prophylaxis for prevention of DVT and PE is a major concern in the management of patients undergoing total joint arthroplasty (TJA). In our practice we have chosen to use warfarin with a goal INR of 2.0-2.5. With a trend toward accelerated rehab and shorter length of stay, it is increasingly common that patients are discharged with sub-therapeutic INR levels (INR below 2.0). The purpose of this study was to evaluate INR level at discharge and to evaluate how the INR at discharge correlates with perioperative complications and re-admission.

**Methods:** We retrospectively reviewed the patient records of all patients undergoing primary total hip or total knee arthroplasty by one of two surgeons at our facility during two calendar years. INR levels on discharge were recorded as well as all complications and readmissions.

**Results:** 437 patients met criteria and were included in our analysis. The average INR on discharge was 1.61. 352 patients (80%) were sub-therapeutic on discharge. 56 (13%) were in the therapeutic range and 33 (7%) were supra-therapeutic. The incidence of any complication or readmission was highest in the supra-therapeutic group at 27%.

**Discussion and Conclusion:** We found a large portion of our TJA patients managed with warfarin for DVT prophylaxis were discharged with sub-therapeutic INR levels. However, the patients who were at greatest risk of developing a complication were those whose INR was too high. This finding suggests that bleeding risk is more a threat to patient health than risk of clot formation after TJA. In conclusion, we recommend the judicious use of warfarin for DVT prophylaxis after TJA. We also recommend erring on the lower end of the therapeutic range to prevent complications.

### Poster 4

## Proximally Coated Tapered Femoral Stem: Expect Failures Up to Two Years

Davis S. Casper, BS  
\*Benjamin Zmistowski, BS  
Jeffrey Muenzer, BS  
Camilo Restrepo, MD  
Javad Parvizi, MD, FRCS

**Introduction:** Cementless total hip arthroplasty (THA) achieves fixation to the natural tapered contour of the proximal femur providing long-term stability through osseointegration. It is well accepted that osseointegration is achieved within the first few postoperative weeks. Thus, most surgeons believe once osseointegration occurs a stem is very unlikely to fail due to aseptic loosening. The hypothesis of this study was that aseptic failure of proximally tapered stems can occur anytime following index surgery and surveillance of these patients is critical.

**Methods:** Using an institutional database, all patients who had undergone primary THA at our institution using a proximally coated stem (Accolade-Stryker) were identified. Among 7,981 cases, 52 (34 male and 18 female) patients required revision arthroplasty due to aseptic loosening of the femoral stem. Detailed review of medical and radiographic records was performed to confirm the etiology of failure. Patient demographics as well as date of revision were documented in order to determine the timing and characteristics of failure.

**Results:** Of the 52 loosening, 2 occurred within the first six weeks, 21 within 6 months, 32 within a year, and 20 patients did not present until after their first postoperative year. Symptoms developed at a mean 0.97 years (range: 0.07-4.53 years) postoperatively, while the time to revision averaged 1.44 years (range: 0.1-4.9 years). When comparing demographic data

such as age, gender, or BMI, to time of failure, no significant associations were appreciated.

**Discussion and Conclusion:** The delayed presentation of aseptic loosening suggests it is possible for uncemented THA to appear stable without sufficient osseointegration. Due to micromotion or stable fibrous ingrowth patients appear to achieve joint functionality despite lack of optimal osseointegration causing a delay in symptomatic aseptic loosening. Regardless of the timing, surgeons must consider aseptic loosening as an etiology for hip pain post-arthroplasty.

### Poster 5

## Factors Influencing the Outcome of Incision and Drainage of Hand Infections in the Emergency Department Versus the Operating Room

Wayne A. Chen, BS  
Johannes F. Plate, MD  
Zhongyu J. Li, MD, PhD

**Introduction:** Felon infections may lead to severe pain and vascular compromise mandating urgent incision and drainage followed by antibiotic treatment. With community-acquired methicillin-resistant staphylococcus aureus (CA-MRSA) becoming the most common pathogen causing soft tissue infection, this study sought to identify factors that influence the outcomes of surgical debridement of felons to determine the optimal treatment setting, Emergency Department (ED) vs. Operating Room (OR).

**Methods:** In a search of hospital medical records from 2006 to 2010, 103 patients (mean age 34, range 1 to 79 years) were identified who underwent surgical debridement for felons. There were 49 smokers (48%), 15 regular drug user (15%), 14 patients with diabetes mellitus (14%), and two patients with HIV (2%). Fifty-one patients (50%) were managed by the Plastic Surgery service, 41 patients (40%) by Orthopaedic Surgery, and 11 (10%) patients by the Emergency Medicine service.

**Results:** In 81 patients (79%), single surgical debridement (70 in ED, 10 in OR, 1 at bedside) successfully eradicated the infection; 20 patients (19%, 17 in ED, 3 in OR) required repeated debridement and two patients required prolonged oral antibiotics. Patients with CA-MRSA had a significantly increased relative risk (1.31,  $p=0.013$ ) for multiple procedures. Sixty-three patients (61%) received intravenous antibiotics; 57 patients (55%) were admitted for a mean of three

days and multiple intravenous antibiotic infusion. Patients admitted were less likely to require repeat drainage (relative risk 0.75,  $p<0.01$ ). Drug use, smoking, co-morbidities, or managing service did not affect the rate for repeat drainage.

**Discussion and Conclusion:** Successful resolution felons is independent of surgical setting; debridement in the ED or OR resulted in similar rates of infection resolution. Patients with CA-MRSA infection have an increased risk for persistent infection. Identification of the organism and proper antibiotic treatment following debridement remain most crucial for successful treatment of felons to prevent multiple procedures.

### Poster 6

## Non-Invasive Radiofrequency (Monopolar, Capacitive Coupled—mcRF) for the Treatment of Plantar Fasciopathy: 1-Year Results

Joseph Cronkey, MD  
Guido LaPorta, DPM

**Introduction:** Current non-invasive treatment modalities for Plantar-Fasciopathy, oftentimes, fail to relieve the pain associated with this condition. In this study we explore non-invasive mcRF's ability to trigger an active wound healing response and provide significant pain relief.

**Methods:** Forty patients with diagnosis of Plantar-Fasciopathy (six bilateral cases for a total of forty-six feet) were treated with non-invasive mcRF 1 or 2 sessions and followed for one-year. The diagnosis of Plantar-Fasciopathy was based on clinical history (heel pain exacerbated with first steps in the morning and standing); physical examination (tenderness at the origin of the plantar-fascia), and diagnostic ultrasound (thickening of the plantar-fascia greater than 4mm). All patients enrolled had been treated unsuccessfully with a variety of non-operative therapies. The presence of pain ranged from 1 to 120 months (average of 35.2 months). Study participants, throughout the follow-up period, completed Visual Analog Scores (VAS), Roles Maudsley Scores, Foot Function Index, FADI and FADI Sports questionnaires.

**Results:** Demographics: 25 female (62.5%), 15 male (37.5%), 21 right (46%), 25 left (54%), average age 57-years and average BMI 30.1. At enrollment average thickness of the plantar-fascia at its origin was 7.76mm (normal  $\leq 4.0$ mm). At 1 year of follow-up—based on Roles Maudsley Scores—36 feet improved (78%), 9 didn't change (20%) and 1 foot was worse

(2%)—based on VAS Scores—34 feet improved (74%), 10 feet remain unchanged (22%) and 2 felt worse (4%). Follow-up ultrasound revealed, on average, a 50% reduction in the thickness of the plantar-fascia.

**Conclusions:** Non-invasive mcRF has a role in the treatment of pain associated with Plantar-Fasciopathy and potentially other conditions characterized by a failed WHR. The totally non-invasive nature of the procedure and the safety and efficacy suggested by this and other published studies suggest that mcRF offers significant advantages over current treatment alternatives.

### Poster 7

## Extensor Mechanism Rupture Following Total Knee Arthroplasty: Should We Fix It?

Lawrence Delasotta, MD, MPH

\*Alvin Ong, MD

Ashwin Rangavajjula

Manny Porat

Fabio Orozco, MD

**Background:** Extensor mechanism rupture following arthroplasty is debilitating; however, surgical management remains controversial. We hypothesized that our technique utilizing achilles allograft restores extensor function following rupture.

**Methods:** We retrospectively reviewed 1200 patients who underwent a knee revision from Jan. 2004 to June 2009.

Twenty-one patients underwent reconstruction utilizing fresh-frozen achilles allograft. Prior to extensor disruption, eight had either single or two-staged arthroplasty prior to extensor disruption. Five patients had preoperative infection. Twelve had patella rupture; six, patellar comminution; three, Quadriceps rupture. The mean age(yrs), ASA(median), BMI, and follow-up(mo) were 70.05yo, 36.9, 3, and 54.4, respectively; cases were patient-matched to a primary arthroplasty patient. Patient satisfaction and validated outcome scores were obtained.

**Results:** Satisfaction data: overall satisfaction with surgery > extent of pain relief > ability to perform home or yard work > ability to perform recreational activities; Control > Case patients. KOOS/UCLA scores were higher in control patients. Active extension improved in 90%; extensor lag, 86%; range-of-motion, 90%; flexion, 57%. Complications include: extensor revision (19%); high-riding patella (14%); hip fracture d/fall (5%); periprosthetic infection (10%); postop renal failure (5%); and mental status changes (10%).

**Conclusion:** We demonstrate that our technique utilizing Achilles allograft restores function. Patients were satisfied and had good patient-reported function. Preoperative patient expectations should be realigned to improve overall satisfaction. There were no allograft infections. New risk factors for disruption may be history of bilateral TKA, significant medical comorbidities, ORIF for patellar comminution, joint infection, and elevated BMI.

### Poster 8

## The Lateral Dorsal Cutaneous Branch of the Sural Nerve: Clinical Importance of the Surgical Approach to Proximal Fifth Metatarsal Fracture Fixation

Ashraf M. Fansa, MD

Niall A. Smyth, MD

Christopher D. Murawski

John G. Kennedy MD, FRCS (Orth)

**Background:** Fractures of the proximal fifth metatarsal are one of the most common forefoot injuries encountered by orthopaedic surgeons in sports medicine. The percutaneous surgical approach to Jones fracture fixation and corresponding anatomy has received little attention in the literature. The purpose of this descriptive anatomical study was to describe in detail the location of the lateral dorsal cutaneous nerve (LDCN) and its branches, relative to the base of the fifth metatarsal and the standard lateral approach.

**Methods:** Ten fresh-frozen cadaveric foot specimens were used for this study. Specimens were dissected at the lateral aspect of the foot. The LDCN and corresponding branches were identified. A horizontal reference line running from the base of the fifth metatarsal parallel to the plantar surface was constructed to mimic the standard lateral approach and determine whether it would compromise the LDCN or its branches. The distance of the LDCN to the superior border of the peroneus brevis tendon (PBT) was measured relative to standard reference points and the presence of an anastomotic branch was noted.

**Results:** Bifurcation of the LDCN was present in 8/10 specimens, with the dorsolateral branch of the LDCN intersecting the base of fifth metatarsal horizontal line in all specimens at a mean distance of 12 mm proximal to the base of the fifth metatarsal. The LDCN was superficial (i.e. lateral) and inferior to the superior border of the PBT in all specimens and at all reference points.

**Conclusions:** The standard lateral approach to the base of the fifth metatarsal is not safe and has the potential to cause surgical injury to the dorsolateral branch of the LDCN. A “high and inside” approach that remains superior to the superior border of the PBT is anatomically safe and may decrease the chance of intra-operative nerve injury and irritation post-operatively.

### Poster 9

## Functional Results of CR-TKA Using Inside Out-Soft Tissue Balancing in the Valgus Knee

Jeffrey A. Geller, MD  
Todd A. Morrison, MS  
Barthelemy Liabaud, MD

**Introduction:** Total knee arthroplasty in patients presenting with a valgus knee deformity has been challenging for physicians. Not only does the surgeon need to realign the articulation but also obtain adequate balance and stability of the reconstructed knee. Most authors have advocated posterior stabilized total knee arthroplasty (TKA) for these deformities. The purpose of this study was to test the hypothesis that treatment of these arthritic deformities with a cruciate-retaining (CR) TKA results in sufficiently improved patient function.

**Methods:** This was an institutional review board approved prospective observational study of patients receiving a cruciate-retaining TKA prosthesis at the author’s institution between 2005 and 2011. The preoperative angle of valgus knees in our patients ranged from 5 to 25 degrees (mean= 10.4°). Out of 83 patients, 25 had a <10° valgus, 33 a <15° and 25 had a 15° or more valgus. All patients were evaluated for anatomic correction of deformity, as well as improvement in functional results.

**Results:** Our results revealed a significant increase of the SF12 and WOMAC scores 3 months, 1 year and 2 years after surgery for all patients. The range of motion was also significantly increased throughout the 1<sup>st</sup> postoperative year for all the patients across each grouping of valgus deformity. Similarly, each patient valgus deformity was successfully corrected to within 2 degrees of neutral alignment.

**Discussion and Conclusion:** This series of cruciate-retaining total knee arthroplasty showed excellent results in patients with valgus knees presenting with an angle  $\leq 15^\circ$ , similar to prior posterior stabilized series. Patients presenting with a larger deformity had improved results, but gains were more modest in this cohort.

### Poster 10

## Minimally Invasive Partial Fasciectomy for Dupuytren’s Disease

Scott Gelman, BA  
\*Abdo Bachoura, MD  
Robert E. Schlenker  
Sidney M. Jacoby, MD  
Eon K. Shin  
Randall W. Culp, MD

**Introduction:** Several surgical and non-surgical treatment options for Dupuytren’s disease have been described, each with specific pros and cons. We hypothesize that partial fasciectomy through a mini-incision approach is as safe and effective as other treatment options.

**Methods:** A retrospective chart review of patients treated with minimally invasive partial fasciectomy by a single surgeon was performed. After excluding patients who underwent multiple procedures, 67 patients and 75 total surgeries on 119 digits remained. Pre-operative and post-operative documentation of all palpable cords and measurements of all joint contractures were analyzed.

**Results:** The mean of age of patients was 63.2 (Range 33-95) including 53 Males and 14 Females. The mean preoperative contracture was 33.9 degrees (Range 5-90) at MP joints and 35.1 degrees (Range 5-90) at PIP joints. Following minimally invasive partial fasciectomy, all joints on all digits had contractures less than 10 degrees with an average post-operative contracture of 0.11 degrees for MP joints and 0.30 degrees for PIP joints. Post-operative measurements represent a 99.7% and 99.3% improvement from pre-operative measurements respectively. At an average follow up of 6 weeks (range 2-35 weeks), mean contracture was 3.8 degrees at MP joints and 9.1 degrees at PIP joints. This data represents a mean correction of 87.9% and 73.1% respectively. A 1cm transverse incision was made over the cord with an average of 1.9 incisions for PIP joint contractures, 2.2 incisions for MP joint contractures and 2.5 incisions for procedures on both MP and PIP joint contractures. Complications included unresolved paresthesias (n=4), serous drainage (n=2) and wound dehiscence (n=2) that were successfully managed with antibiotics and wound care.

**Discussion and Conclusion:** Minimally invasive partial fasciectomy results in short term contracture correction similar to other techniques with a low rate of complications. While the results of this procedure are promising, long term and compar-

ative follow up is required to gauge the medium and long term effectiveness.

### Poster 11

## Risk Factors for Iliopsoas Impingement Following Total Hip Arthroplasty

Ronald Huang, BS  
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Gus Barrazueta, BS  
Javad Parvizi, MD, FRCS  
Fabio Orozco, MD  
Alvin Ong, MD

**Introduction:** Groin pain following total hip arthroplasty is a significant complication, and may be due to many etiologies including periprosthetic joint infections, fractures, mechanical failure, and iliopsoas impingement, among others. Iliopsoas impingement is an important complication to recognize following THA, as it has a substantial effect on patient quality of life, and may require revision surgery to resolve. Understanding the risk factors that may predispose patients to iliopsoas impingement will help to minimize postoperative risk.

**Methods:** 4,872 cases of primary and revision THA were performed at our institution between January 2007 and December 2010. 78 patients of the 4,872 patients (1.6%) reported pain at postoperative visits were evaluated using ultrasound of the ipsilateral groin. 51 patients were diagnosed with iliopsoas bursitis, tendinosis, and/or tendinitis. Each patient with iliopsoas pathology was matched to three controls without iliopsoas pathology that underwent THA, by date of surgery and Charlson Comorbidity Index (CCI). Patient charts were reviewed for demographic variables and intraoperative variables including: surgical approach, implant design, head size, liner size, and cup size.

**Results:** Average age and BMI in the iliopsoas pathology group was not significantly different between the two groups; 53.0 years and 28.2 kg/m<sup>2</sup> in the pathologic group compared to 53.9 years and 28.5 kg/m<sup>2</sup> in the control group. Gender was also not found to be associated with iliopsoas pathology. In the pathologic group and controls, cup size was an average of 53.1 mm and 53.4 mm respectively and head size an average of 32.5 mm and 31.7 mm respectively. Decreased head to cup ratio was a risk factor for iliopsoas impingement, at an average of 1.6 in the pathologic group compared to 1.7 (range: 1.1 to 2.4) in the control group. Only three hips in the study were replaced with metal on metal components, two of which developed iliopsoas tendinitis.

**Discussion and Conclusion:** Iliopsoas impingement is a common cause of groin pain following THA. Our study suggests that large implant head size is a risk factor for iliopsoas impingement. Particularly, an oversized implant head size compared to acetabular cup size may predispose patients to developing this complication.

### Poster 12

## The Influence of Limb Selection and Blast Medium on Heterotopic Ossification Following Blast Amputation in a Rat Model

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David Jin Yoo, MS  
Jason L. Blevins, BA  
Gregory Gasbarro, MS  
Thao P. Nguyen, MD  
Vincent D. Pellegrini Jr., MD  
Tyler Hughes

**Introduction:** Heterotopic ossification (HO) commonly complicates extremity blast amputations in soldiers in the contemporary war theater. This injury has become more prevalent due to the increased use of improvised explosive devices and advancements in modern body armor. The objective of this project is to determine the effects of blast medium and limb selection on the quantity and quality of HO formation following blast amputation in a rat model.

**Methods:** 48 rats underwent extremity blast amputation via column of propelled medium following detonation of a submerged explosive. There were four experimental groups (each n=12): Groups 1 and 2 used water to complete hindlimb and forelimb amputations respectively, while Groups 3 and 4 used sand to complete hindlimb and forelimb amputations, respectively. Each blast-injured limb was irrigated and immediately closed. Rats were followed with serial radiographs until euthanasia at 24 weeks. HO severity was quantified as mild (1), moderate (2), or severe (3) and classified as contiguous with the stump or as distinct ectopic bony islands.

**Results:** Four wound complications were observed; all were in hindlimb-injured animals. One water-blasted dehiscence required bone resection and re-closure, ultimately resulting in severe HO with bony islands. Three sand-blasted hindlimbs had wound infections requiring irrigation and debridement; two were euthanized at 9 weeks due to recurrent infection with severe HO and the other infection resolved and developed mild, contiguous HO at 24 weeks. Groups 1-4 had a mean HO severity of 2.08, 1.08, 2.08, and 1.33 respectively (ANOVA

$p=0.00$ ). Groups 1-4 developed bony islands in 10, 4, 10, and 4 stumps respectively ( $p=0.0010$ ).

**Conclusions:** Hindlimb blast amputations developed more severe HO that more likely involved the surrounding soft tissues than did forelimbs. There was no difference in HO severity or quality amongst limbs amputated with sand or water, suggesting the high energy blast mechanism induces heterotopic bone growth independent of the blasted medium or propensity for infection.

### Poster 13

#### Complications in the Elderly: How to Plan for Your Hip Fracture Patient

Patrick W. Kane, MD  
Adam G. Miller, MD  
Michael Bercik, MD  
Fabio Orozco, MD  
Alvin Ong, MD

**Introduction:** Hip fractures represent a significant injury for the elderly population. Previous literature has related delay to surgery with outcome, but little has done to analyze separate in-house complications and age associations. The purpose of this study was to examine a large series of hip fractures to determine risk factors and in-hospital outcomes resulting from this injury.

**Methods:** 722 patients underwent surgical correction of hip fractures at our institution during a ten year period. Patients were divided into two groups: Group A less than 75 years old and Group B greater than or equal to 75. Patient demographics, fracture type and treatment, time to surgery, co-morbidities, complications, and mortality rates were analyzed.

**Results:** Delay to surgery greater than 48 hours was associated with increased complications. Total post-operative complication rates were significantly higher in the older age group, 42.3 versus 60.2 percent. Cardiac complications in particular, including arrhythmia, congestive heart failure exacerbation, unexplained hypotension, and acute myocardial infarction, were found to be significantly increased in the seventy five and older age group, 2.3 versus 8.2 percent. However, in-hospital mortality rates were not found to differ significantly, 0.9 versus 2 percent.

**Discussion and Conclusion:** Our results highlight the impact hip fractures can have on the elderly population. Although no in-hospital mortality difference was noted, the increased inci-

dence of post-operative complications, particularly cardiac, may contribute to the traditionally high one year mortality rates following this injury. Treating physicians should maintain a high index of suspicion for cardiac events following hip fracture treatment, particularly in the elderly population.

### Poster 14

#### Treatment of Lateral Malleolar Fractures with Severe Soft Tissue Injuries Using Rush Rods

Anna Katsman, MD  
Joseph J. King, MD  
Michael A. Mashura, BS  
Susan P. Harding, MD

**Introduction:** Few studies highlight the outcomes and complications of patients with lateral malleolar fractures treated with rush rod fixation. This study evaluates the outcomes of patients treated with rush rod fixation due to severe soft tissue injuries.

**Materials and Methods:** A retrospective review was performed of all surgically treated ankle or distal tibia/ fibula fractures between 2003-11 by a single trauma surgeon. Inclusion criteria were ankle fracture, lateral malleolar fracture treated with rush rod due to severe soft tissue injury, and minimum 4 months followup. Partial weight bearing was defined as time until advancement of weight bearing was initiated. Final follow-up was determined by clinical notes or phone interview. Pain was determined by standard Visual Analogue Score (VAS).

**Results:** Nine patients (6F, 3M), average age of 66 years (31-95 years), were identified. There were four Weber B and five Weber C injuries; six simple and three comminuted fibula fractures; four open wounds, and five severe soft tissue swelling/ bruising. Average EBL was 126 mL. Mean follow-up was 19 months (range 4 to 47 months). Oral antibiotics were required for persistent wound drainage in two patients. All wounds and incisions eventually healed. There were no infections or hardware failure. One rush rod was removed for persistent pain. Average partial weight bearing began at 6.2 weeks and was advanced to full weight bearing at 9.3 weeks. All patients returned to their previous level of care. Final average VAS score was 0.7 (range 0-3) with five patients reporting no pain. Final average ankle range of motion was 41 degrees (range 30-65), with 11 degrees (range 0-20) of dorsiflexion.

**Conclusion:** Overall, patients in the study had minimal pain and early return of function. Intramedullary fixation of the fibula is an important tool in the management of ankle fractures with severe soft tissue injuries.

### Poster 15

## The Treatment of Distal Femoral Fractures Using the Less Invasive Stabilisation System (LISS), a Multi-Centred Retrospective Review

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**Introduction:** The less invasive stabilisation system has the theoretical advantage of bridging the supracondylar fracture zone as an internal fixator and does not require extensive dissection of soft tissues and bony fragments. We present our results of using LISS for distal femoral fractures. Objectives To assess the outcome of patients with distal femoral fractures treated with LISS plates.

**Methods and Results:** We present a multi-centred retrospective review of 43 patients (33 females and 10 males) treated with LISS plates for distal femoral fractures. The mean age was 72 years (range 18-102). The commonest mechanism of injury was simple mechanical fall. According to the AO classification, there were 26 type 33A, 2 type 33B, 5 type 33C, 9 type 32A and 1 type 32B. There were 8 periprosthetic fractures of which 2 occurred during total hip replacement. The mean follow up period was 17 months. Five patients died average 8 days (range 2-20 days) after fixation of fracture. At the time of follow-up 32 patients had united, average time to union was 3 months (range 1-6), 3 patients were delayed-unions 11 months (range 8-18). There was one deep infection, and one inadequate fixation that was revised to a retrograde nail. There was one non-union in a patient with multiple sclerosis. There were no other complications.

**Conclusion:** The results of LISS plating for distal femoral fractures are encouraging. These fractures tend to occur in the elderly population. The procedure requires careful planning and experience in the operative technique. Most fractures proceed to union without the need for primary bone grafting.

### Poster 16

## A Cost Analysis of Using a Long Gamma Nail to Prevent Periprosthetic Fracture

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**Introduction:** The short gamma nail is a commonly used device for the treatment of stable intertrochanteric hip fractures. First generation gamma nails have been complicated by fractures at the tip of the nail. The long gamma nail has been shown to reduce the incidence of these periprosthetic fractures. The purpose of this meta-analysis was to compare the cost-effectiveness of the long gamma nail as an alternative to the 2nd and 3rd generation short gamma nail as the initial treatment of stable intertrochanteric hip fractures.

**Methods:** Using MEDLINE via PubMed, all articles published in the English language between January 2000 and May 2007 that included the key words "trochanteric gamma," "long gamma," "hip," "intertrochanteric," and "gamma" were reviewed. A manual search of the reference list of each paper was also performed. Five papers were reviewed that fit these criteria. Gross costs were estimated from Medicare reimbursement data for the relevant Diagnosis-Related Group codes plus published costs for each Current Procedural Terminology code.

**Results:** 329 gamma nails implanted were reviewed and a total of 2 periprosthetic fractures occurred. Cost analysis demonstrated an extra spending of \$37,644,778 to \$65,576,910 (2005 dollars) if the more expensive long gamma nail was used as the initial treatment of all stable intertrochanteric hip fractures. The periprosthetic fracture rate with short gamma nails would have to be 3.94% for the long gamma nail to reach cost-effectiveness.

**Conclusions:** The periprosthetic fracture rate of the short gamma nail in this meta-analysis suggests that the use of the long gamma nail as the primary treatment for all stable intertrochanteric hip fractures is not a cost-effective treatment.

## Poster 17

## A Novel Approach to Decrease Post-Operative Complications After Total Hip Arthroplasty

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**Introduction:** Specific best practice measures have demonstrated improved outcomes after total joint replacement. In an effort to reduce cost and improve outcome, our health system developed a standardized approach to THA, based on 32 evidence-based or consensus best practice measures which were standardized via an electronic medical order system. Physician compliance was incentivized and a warranty offered to payers for complications. Our hypothesis was that system/physician compliance would result in decreased complications.

**Methods:** Data from a health system data repository and medical records from patients who were enrolled in the standardized system and underwent surgery from 2007-2010 were retrieved. Percent compliance to all of the 32 measures and several outcome measures were analyzed for each patient. Factors potentially influencing outcomes, including patient age at surgery, sex, body mass index (BMI) at surgery, and hospital site of surgery were assessed. Outcome measures included infection, PE/DVT, readmission within 90 days, and periprosthetic fracture.

**Results:** Eight hundred and one procedures, representing 748 patients, were included for analysis. The mean age was  $66.0 \pm 0.5$  years. The BMI breakdown was 19% normal, 33.9% overweight, and 10.1% morbidly obese. Increasing compliance to all measures reduced risk of pulmonary embolism and marginally reduced risk of fracture and readmission to the hospital within 90 days. Increasing BMI increased risk for CDC-defined superficial wound infections, which was 3.5% in this population. The deep infection rate was 1.5% but was not influenced by compliance, BMI, sex, or patient age.

**Discussion and Conclusions:** The risk for surgical complication was significantly higher in those who were not as compliant with the standardized system. The data suggests that compliance to a comprehensive set of best practices for THA reduces risk for post-operative complications. The likelihood that such compliance also decreases cost should be further evaluated.

## Poster 18

## Acetabular Component Positioning in THA: The Impact of Obesity

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**Introduction:** Acetabular component position is an important determinant of implant stability and bearing surface wear after THA. Nonetheless, the incidence of malpositioning has been reported to approach 50%. Patient obesity, low surgeon volume, and minimally invasive approaches are known risk factors. While surgical approach and surgeon volume can be controlled by the physician, obesity represents a growing concern. As the incidence of obesity continues to increase, it is important to recognize its effect on intra-operative component positioning in THA. Our goal was to assess the impact of obesity on component position for a high-volume surgeon using a standard posterolateral approach.

**Methods:** A consecutive series of 120 obese (BMI > 30, mean BMI 34.4) and 120 non-obese patients (mean BMI 25.4), who had undergone primary THA by a single surgeon, were included in our retrospective study. AP Pelvis and Cross-table radiographs obtained at the first post-operative visit were analyzed using EBRA software to determine inclination and anteversion angles. Optimal position was defined as 30-45° of inclination and 5-25° of anteversion.

**Results:** Mean inclination and anteversion were 39° (+/-5.0°) and 16.2° (+/-7.5°), respectively, in the non-obese group and 40.6 (+/-5.4°) and 16.6 (+/-5.5°), in the obese group. In the non-obese group 91 patients were within the desired range for both measurements, 29 were out of range in at least one as compared to 89 and 31 in the obese group. The overall incidence of malpositioning was 25% for both groups. Among outliers mean deviation from optimal range was  $\leq 3.8^\circ$  in all groups.

**Discussion and Conclusion:** The risk of component malpositioning in THA may be substantially reduced when surgery is performed by an experienced, high volume surgeon utilizing a standard posterior approach. In this setting the deleterious effect of obesity may be overcome.

Poster 19

## The Tenosynovial Flap for Recalcitrant Carpal Tunnel Syndrome

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**Introduction:** Recalcitrant carpal tunnel syndrome (CTS) occurs due to perineural fibrosis tethering the median nerve within the carpal tunnel. Operative intervention for recalcitrant CTS often utilizes local vascularized tissue to provide coverage of the median nerve and avoid scarring or adherence to the surrounding structures. While the hypothenar fat pad is the most commonly cited source of vascularized tissue, alternate options exist. In this study, we examine outcomes of using a tenosynovial flap as the source of local vascularized tissue for coverage of the median nerve in recalcitrant CTS.

**Methods:** From 2006 to 2011, a single surgeon performed revision carpal tunnel surgery using a tenosynovial flap on 45 wrists in 41 patients. The cohort included 22 males and 19 females, with an average age of  $60.4 \pm 2.0$  years. We evaluated patient outcomes retrospectively based on pre- and post-operative Tinel's and Phalen's signs and patient-reported pain and numbness measures.

**Results:** Preoperatively, there was a positive Tinel's sign in 38 cases (84%), while only one patient had a positive Tinel's postoperatively (2%). There was a positive Phalen's test in 17 cases preoperatively, and none had a positive Phalen's postoperatively. Patients reported that pain was completely resolved in 43 cases (96%), and patients reported marked or complete improvement in numbness and tingling in 36 cases (80%). The remaining nine patients reported persistent numbness in the fingertips at an average follow-up of 11 months.

**Conclusions:** The tenosynovial flap provides an excellent option for providing vascularized coverage for the median nerve in recalcitrant CTS. A tenosynovial flap can be used in cases where the hypothenar fat pad is lacking and avoids any functional loss. Our findings indicate that revision CTS with a tenosynovial flap is successful in relieving both pain and numbness in 80% of cases and is associated with few if any complications.

Poster 20

## Retrieval Analysis of Large Head Metal on Metal Taper Trunion Articulation

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**Introduction:** Large head metal on metal total hip replacements have demonstrated poor performance and significant incident of adverse reaction to metal debris. Authors have suggested that increased wear at the trunion-taper junction contributed to poorer survival and higher revision rates. The purpose of this investigation is to assess the taper junction for retrieved implants following revision of metal on metal total hip arthroplasties.

**Methods:** 42 large head metal on metal taper-trunion articulations were examined in our institutional implant retrieval lab. The female tapers were examined visually by one observer. Gross wear and deformation of the taper or trunion were recorded. Discoloration associated with oxidative wear was also recorded. All retrieved femoral head implants were assessed using a laser profilemetric system in order to determine location and severity of wear. A volumetric wear rate was calculated from the scan.

**Results:** On visual inspection of the female tapers, 16% demonstrated visual toggling wear on directly opposite surfaces. The toggling was present in only one implant design and did not correlate with femoral head size or length of implantation. In addition, there was a 52% incidence of discoloration likely representing oxidative wear. Wear was present with longer length of implantation (31 vs 23 months). Laser profilemetric analysis and wear rates are also presented.

**Discussion and Conclusion:** Taper wear and micromotion is likely a contributing factor to adverse reaction to metal debris in metal on metal total hip arthroplasty which may be due to increased micromotion with larger head diameter.

## Poster 21

## Outcomes of Pediatric Supracondylar Humerus Fractures Treated by Adult Hand Surgeons

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**Introduction:** Supracondylar humerus (SCH) fractures are the most common elbow fracture in children. Type II and type III injuries require surgical treatment, usually with CRPP. Over the past decade, there has been an increasing trend toward the treatment of these injuries solely by pediatric orthopaedic surgeons. The purpose of this study is to determine differences in treatment strategies and outcomes of pediatric supracondylar humerus fractures treated by adult hand fellowship trained physicians.

**Methods:** A retrospective review was conducted analyzing the outcomes of type II and type III pediatric SCH fractures treated by orthopaedic hand surgeons over a 4-year period.

**Results:** The average age of the patients was 5 years (range 2-9), including 11 males and 12 females. Preoperatively, two patients had diminished pulses and two patients had neurologic injuries. Approximately three-quarters of the patients (73%) were treated within 12 hours of injury. Fifty six percent had a type III fracture with 30% of these being treated with ORIF. Three of the four patients underwent open reduction to obtain an adequate reduction as closed reduction maneuvers were felt to be inadequate, with the remaining patient undergoing brachial artery exploration without repair. Twenty six percent received at least one medial pin. The average time for removal of hardware was 4.3 weeks with 26% of patients having their hardware removed in the operating room. Forty percent were prescribed physical therapy. No patients had infection or compartment syndrome. Three patients had residual nerve palsies and five patients had cubitus varus (4 mild, 1 severe).

**Discussion and Conclusion:** Adult orthopaedic hand surgeons can safely treat pediatric SCH fractures with a low complication rate. Compared to current pediatric literature, there is an increased utilization of open reduction techniques and medial pins, longer average time for removal of hardware, more hardware removal performed in the operating room, and more prescribed physical therapy.

## Poster 22

## Patellar Impingement on Tibial Polyethylene; Is It a Problem in Modern Posterior Stabilized Total Knee Arthroplasty

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**Introduction:** Patellar impingement on tibial polyethylene (PIP) is a complication of total knee arthroplasty. It can occur due to inaccurate restoration of the joint line and soft-tissue contracture. The purpose of this study is to determine the prevalence and etiology of PIP following posterior stabilized TKA.

**Methods:** We retrospectively reviewed 846 TKAs in 711 patients between January 2008 and June 2008. A total of 65 TKAs with PIP (7.6%, 65/846) were compared with a matched-control group of 130 TKAs without PIP. Mean F/U was one year. The patients were matched on basis of age, sex, TKA implant system. Radiological parameters including the change of patellar tendon length, Insall-Salvati ratio, change of joint line, patellar tilt, tibial slope, posterior femoral offset were measured on radiographs taken at latest follow-up visit. Surgical factors including lateral release and thickness of polyethylene liner were also compared.

**Results:** The preoperative and postoperative patellar tendon length averaged 38.2 mm and 31.3 mm in PIP group was compared with 40.2 mm and 38.8 mm in the control group, respectively. The preoperative and postoperative Insall-Salvati ratio averaged 0.88 and 0.73 in PIP group was compared with 0.93 and 0.91 in the control group, respectively. The preoperative and postoperative joint line averaged 22.7 mm and 28.9 mm in PIP group was compared with 22.3 mm and 25.5 mm in the control group, respectively.

**Conclusion:** The incidence of PIP correlated with progressively decreased patella tendon length and progressively decreased Insall-Salvati ratio (patella baja) which may suggest soft tissue contracture, and elevated joint line. Some implant design showed a trend toward higher incidence of PIP but the thickness of polyethylene liner did not contribute to increased incidence. Our study reinforced the importance of accurate joint line restoration, and the avoidance of iatrogenic injury to the patella tendon which may lead to shortening of patellar tendon length.

Poster 23

## Similar Improvement in Gait Parameters with Direct Anterior and Posterior Approach Total Hip Arthroplasty

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**Introduction:** Direct anterior approach (DAA) total hip arthroplasty (THA) has been reported to be a muscle sparing approach. The purpose of this study was to compare gait patterns over time between patients undergoing THA via DAA and posterior approach (PA).

**Methods:** 22 patients with unilateral primary hip osteoarthritis were prospectively enrolled and gait analysis was performed prior to and 6 months after surgery. All PA THA's were performed by a single surgeon from January 2008 to February 2009; all DAA THA's were performed by the same surgeon from January 2010 to May 2011 with similar design of uncemented acetabular, femoral components and bearing surfaces. Reflective markers were placed on the lower extremity and motion data with level walking collected using six infrared cameras. Ground reaction forces were recorded with a multicomponent force plate. A repeated-measures ANOVA was used to compare changes in gait parameters over time. Harris Hip Score was used to quantify pain and function from preoperative to 6 months.

**Results:** There were 11 patients in both groups with similar age, sex and BMI distribution. At 6 months follow-up, both groups demonstrated improvement in flexion/extension range of motion (ROM) ( $p=0.003$ ), abduction/adduction ROM ( $p<0.001$ ), and peak extension moment ( $p=0.006$ ). Internal/external ROM improved significantly over time in the DAA group ( $p = 0.005$ ), but not in the PA group ( $p=0.898$ ). Gait velocity improved significantly from preoperative to 6 month values in PA group ( $p=0.001$ ) and were similar to the DAA group at 6 month follow-up ( $p= 0.207$ ). Pain and function scores were also similar.

**Conclusions:** THA performed via DAA and PA offer similar improvement in gait parameters at 6 months follow-up with the exception of internal/external ROM. This might be related to release and repair of external rotators during PA THA.

Poster 24

## Change in Spinal Alignment After Total Hip Arthroplasty

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**Introduction:** Hip Spine Syndrome is the development of symptomatic spinal complaints after total hip arthroplasty (THA). The purpose of this study was to determine (1) if there are significant differences in sagittal spinal alignment of patients with symptomatic hip osteoarthritis compared to similar patients with spinal arthritis and (2) whether spinal alignment changes after THA.

**Methods:** Prospective Clinical Study. Following IRB approval, consecutive patients with no significant history of back pain or lumbar complaints who were scheduled to undergo THA underwent lateral lumbar radiographs prior to and nine months after elective total hip arthroplasty. Exclusion criteria were patients who had previous THA, previous spinal surgery, infectious, fractures, or neoplastic conditions. Radiographic measurements of lumbar alignment included sacral slope, lumbar lordosis, L1 incidence, and L1 axis S1 distance. The control population of patients underwent serial radiographs over the same period for evaluation of lumbar degenerative disease. Paired samples t test was used to compare pre and post arthroplasty measurements. Independent samples T test was used to compare the THA and control populations.

**Results:** Twelve patients underwent preoperative radiographs and postoperative radiographs. There were 34 patients in the control group. There were no statistically significant differences between THA and control patients in preoperative, postoperative, or % change in lumbar lordosis or L1 ASD ( $p>0.05$ ). There was statistically significantly increased sacral slope both preoperatively and postoperatively in patients with total hip arthroplasty (mean 23 degrees) versus lumbar patients (mean 11 degrees,  $p=0.001$ ). Change before and after the THA was measured. There were no statistically significant differences in mean preoperative and postoperative sacral slope (Preop 24 degrees vs Postop 24 degrees,  $p=0.6$ ), lumbar lordosis (49.1 vs 46.0,  $p=0.4$ ), or L1 ASD (34 vs 36 degrees,  $p=0.8$ ).

**Discussion:** These results indicate that there is no significant change in spinal alignment after unilateral total hip arthroplasty. At baseline, patients with symptomatic spine complaints have less sacral slope than their hip arthroplasty counterparts. Hip-spine syndrome may occur from other etiologies other than change in spinal posture and alignment after arthroplasty.

### Poster 25

## Radiographic and Clinical Limb Length Discrepancy Do Not Correlate with Patient Perception

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**Introduction:** Limb length discrepancy (LLD) after total hip arthroplasty (THA) has been demonstrated to lead to poorer functional outcomes. The aim of this study is to demonstrate whether the presence of significant clinical or radiographic LLD correlates with patient perception of LLD.

**Methods:** A prospective case series of 126 consecutive THAs in 116 patients (52 male, 64 female) from 2008-11. Postoperative radiographs were measured from the inferior ischial margin to the superior take-off of the lesser trochanter to assess for limb length discrepancy. Postoperative clinical limb length measurements were taken in the office with the patient lying supine. LLD were divided into 4 categories ( $I = LLD \leq 15\text{mm}$ ). LLD of 5 mm or greater was considered significant. Patient perception of LLD was assessed by questionnaire at preoperative and postoperative visits. Statistical analysis was performed using paired T-tests for limb length measurements and McNemar tests for patient perception of LLD.

**Results:** The average LLD was 4.31mm (range 0-35) by clinical exam and 7.93mm (range 0-30.9) by x-ray. 79.4% patients had LLD by radiograph and 54.9% patients had LLD clinically. 13.6% patients perceived a difference. There was a significant difference between postoperative clinical measurement and patient perception of LLD, as well as between postoperative radiographic measurement and patient perception. Patients with significant postoperative LLD (Categories II-IV) measured either clinically or radiographically perceived LLD more often compared to those without significant LLD (Category I).

**Discussion and Conclusion:** Our study demonstrates that radiographic and clinical LLD do not correlate with patient

perception. Patients with greater measured LLD are more likely to perceive this difference. Future studies should aim to correlate the degree of measured LLD with other demographic variables and the degree of function lost.

### Poster 26

## Accuracy of Robotic Assisted Femoral Osteochondroplasty for Treatment of FAI

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**Introduction:** Femoroacetabular impingement (FAI) surgery is a technically demanding procedure where the accuracy and precision of correction is potentially critical to the success of the procedure. This study compares the accuracy of a new robotically assisted technique to a standard open technique.

**Methods:** Sixteen identical Sawbone models with a cam type impingement deformity were resected by a single surgeon simulating an open procedure. Eight procedures were performed manually using a free-hand technique and 8 were performed using robotic assistance that created a 3-dimensional haptic volume. All 16 sawbones were scanned by Roland LPX-600 Laser scanner with 1mm plane scanning pitch and 0.9 degree of rotary scanning. Post-resection measurements included arc of resection, volume of bone removed and resection depth and were compared to the preoperative plan.

**Results:** The desired arc of resection was  $117.7^\circ$  starting at  $-1.8^\circ$  and ending at  $115.9^\circ$ . Manual resection resulted in an average arc of resection error of  $42.0 \pm 8.5^\circ$  with an average start error of  $-18.1 \pm 5.6^\circ$  and end error of  $23.9 \pm 9.9^\circ$  compared to a robotic arc of resection error of  $1.2 \pm 0.7^\circ$ , an average start error of  $-1.1 \pm 0.9^\circ$  and end error of  $-0.1 \pm 1.0^\circ$ . Over-resection occurred with every manual resection with an average volume error of  $758.3 \pm 477.1\text{mm}^3$  compared to an average robotic resection volume error of  $31.3 \pm 220.7\text{mm}^3$  (4 over- and 4 under-resected).

**Discussion and Conclusion:** Even using an approach that maximizes visualization, robotic assistance proved to be significantly more accurate and less variable than manual techniques. This is critical as the success of the surgical treatment

of FAI depends on accurate and precise bony resection. The benefits of this new technique may prove even more valuable with less invasive, arthroscopic treatments that can be even more technically demanding.

### Poster 27

## Hip Strength Recovery with Direct Anterior and Posterior Approach Total Hip Arthroplasty: Are There Any Differences?

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**Introduction:** Cadaveric studies have reported damage to the direct head of rectus femoris and tensor fascia lata muscles with direct anterior approach (DAA) and to the abductors, external rotators with posterior approach (PA). The aim of this prospective study was to evaluate differences in hip muscle strength recovery between DAA and posterior approach (PA) THA.

**Methods:** Patients with unilateral hip osteoarthritis undergoing THA at a single institution from January 2011 to October 2011 were enrolled. All DAA THA's were performed by one surgeon, and all PA THA's were performed by another surgeon with similar design of components, pain management and rehabilitation protocols. Hip muscle strength was measured with a handheld dynamometer in all planes by a single observer preoperatively, at 6 weeks and at 3 months. Functional recovery was assessed with the motor component of Functional Independence Measure, UCLA activity score, Harris hip score, SF-12 score.

**Results:** There were 30 patients (15 per group) with similar age, sex, BMI and preoperative functional scores. There was a significant difference between groups in ER strength recovery pattern ( $p=0.04$ ) with greater mean deficit in PA group from preoperative to 6 weeks (37%) and 3 months (28%); whereas DAA group demonstrated 3% mean deficit at 6 weeks and 2% mean improvement at 3 months from preoperative values. Flexion strength decreased in DAA group by a mean of 10% at 6 weeks ( $p=0.07$ ) but improved at 3 months by a mean of 12% as compared to preoperative values. There were no differences in recovery pattern of other hip movements between groups. Functional recovery scores between groups were similar.

**Discussion:** Both DAA and PA THA offer similar recovery in hip muscle strength up to 3 months with exceptions of ER strength deficit in PA group and a trend to flexion strength deficit at 6 weeks in DAA group.

### Poster 28

## Evaluation of a Virtual Reality Surgical Simulator for the Development of Arthroscopy Skills in First Year Orthopaedic Surgery Residents

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**Introduction:** The purpose of this study is to determine whether a virtual reality arthroscopy surgical simulator will lead to improved arthroscopy performance in first year orthopaedic surgery residents.

**Methods:** The hypothesis of this study is that training on a virtual reality surgical simulator will correlate with improved performance and skill in both knee and shoulder arthroscopy in first year orthopaedic surgery residents at a single institution. Participants were randomized to either train on the virtual reality surgical simulator ( $n=4$ ) or receive 2 hours of didactic lectures with models (non-simulator) ( $n=4$ ). Subjects in the simulator group were required to complete a total of 2.5 hours of simulator training in both knee and shoulder arthroscopy simulator modules. Both groups were then evaluated in both knee and shoulder arthroscopy using a cadaver. Performance was measured by time to completion of a standardized protocol checklist and a cartilage-grading index (CGI) (scale 0-10).

**Results:** All subjects had no previous arthroscopy experience prior to the study. The simulator group had a shorter time to completion in both knee (simulator:  $8.2 \pm 1.3$  min, non-simulator:  $9.4 \pm 4.5$  min;  $p=0.3$ ) and shoulder (simulator:  $6.9 \pm 1.8$  min, non-simulator:  $11.4 \pm 2.7$  min;  $p=0.06$ ) arthroscopy. Similarly, the simulator group had improved CGI scores in both the knee (simulator:  $4.5 \pm 0.6$ , non-simulator:  $5.8 \pm 1.7$ ;  $p=0.21$ ) and shoulder (simulator:  $3.0 \pm 1.0$ , non-simulator:  $5.3 \pm 1.7$ ;  $p=0.10$ ) arthroscopy.

**Discussion and Conclusion:** This study suggests that first year orthopaedic surgery residents who train with the surgical simulator have improved arthroscopic performance. While

results did not meet statistical significance, the simulator group outperformed the non-simulator group in all measured parameters. This indicates that surgical simulators may be a potential powerful training tool for junior orthopaedic residents.

### Poster 29

## Minimally Invasive Transforaminal Lumbar Interbody Fusion Compared to Open: Is It Worth the Switch?

Greg Riebel, MD

**Introduction:** Minimally invasive surgeries are becoming popular, with spine applications of this technology available. The goal of minimizing soft tissue trauma and maintain improved function of the paraspinal musculature is the desire of this technique over the traditional surgical approach.

**Methods:** A retrospective review of minimally invasive transforaminal lumbar fusions (MIS) were compared with traditional open posterior instrumented spinal fusions (PSF). The medical records of 101 patients treated for one level degenerative spondylolisthesis with spinal stenosis or recurrent disc herniation were evaluated. Fifty seven consecutive MIS procedures were compared with forty four open procedures (PSF) accomplished over a 6 year period. The following criteria were compared between the two groups: demographic characteristics, operative time, blood loss and complications. Clinical and radiographic outcomes were not evaluated.

**Results:** Comparison of the two groups revealed that the blood loss was significantly less in the MIS group, The surgical and anesthesia time were significantly less in the MIS group. The MIS operative time was 107 minutes while the open group took on average 139 minutes. The Fluoroscopy time was 64 seconds in the open group and 102 seconds in the MIS group. We found that those undergoing MIS rather than open fusion returned to work sooner, and the number and type of complications were similar. In a community hospital setting minimally invasive lumbar spinal fusion lowers patient and hospital costs, and improves on all parameters of outcomes.

### Poster 30

## Is There an Advantage to Use of Tourniquet Only During Cementation in Primary Total Knee Arthroplasty?

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**Introduction:** Tourniquet use only during cementation is a strategy used to decrease tourniquet time during primary total knee arthroplasty (TKA). We designed a prospective cohort study with the hypothesis that use of tourniquet only during cementation will have better clinical outcome than tourniquet used during the entire procedure.

**Methods:** Group 1 (40 patients) comprised of TKAs performed by a surgeon using tourniquet only during cementation. Group 2 (40 patients) consisted of TKAs performed by another surgeon using tourniquet from incision to arthrotomy closure with similar surgical technique, cement type, cementing technique and postoperative protocol. Visual Analogue scale (VAS) pain scores, narcotic consumption, ability to straight leg raise (SLR), range of motion (ROM) at discharge, length of stay (LOS) were recorded. Isometric quadriceps strength (Biodex), ROM, SF-36 scores, Knee society scores (KSS) were recorded preoperatively, at 6 weeks, 3 months and 1 year. Radiographic analysis was performed on 6 week postoperative radiographs by a single observer to compare cement penetration around tibial and femoral components between groups (Ewald et al).

**Results:** Both groups were comparable in terms of demographics and preoperative clinical function. Average tourniquet time was significantly lower in group 1 (42.3 minutes) as compared to group 2 (77.5 minutes). There was a trend to lower pain scores (VAS) in group 1 at 24 (p=0.06), 48 (p=0.07) and 72 hrs (p=0.08) postoperatively. There were no significant differences between groups in other outcome measures up to 1 year postoperatively. One patient in group 1 and 3 patients in group 2 developed pulmonary embolism. Cement penetration around femoral and tibial components was similar in both groups.

**Discussion and Conclusion:** TKA with reduced tourniquet time marginally improves postoperative pain scores, achieves comparable cement penetration but doesn't significantly influence clinical outcome scores up to 1 year. Higher incidence of

pulmonary embolism with increased tourniquet time is concerning.

### Poster 31

## An Objective Arthroscopic Assessment Tool for Orthopaedic Residents

Patrick C. Schottel, MD  
M. Michael Khair  
Jennifer Hammann-Scala, CST  
Anil S. Ranawat, MD

**Introduction:** Traditional resident assessment of orthopaedic surgical technical proficiency relies exclusively on subjective parameters. More standardized objective measures are needed to ensure training consistency and, more importantly, surgical competency. The purpose of this study was to determine if a standardized arthroscopic shoulder and knee test were appropriate means for evaluating a resident's arthroscopic skill after completing a training course.

**Methods:** Seven PGY3 orthopaedic surgery residents rotating on the Sports service were tested during the first and last week of their six week rotation. All rotations included three or more operative days a week, a weekly procedural cadaver lab and daily didactic lectures. Testing consisted of standardized sequential steps in a timed cadaveric shoulder and knee arthroscopic surgery that included tasks such as establishing portals, performing defined diagnostic maneuvers and completing procedures (e.g. acromial decompression). Timed results were statistically compared using a paired t-test.

**Results:** All residents showed improvement at final testing for both surgical modules. The average reduction in tested time was statistically significant. The average post-course time was 739.1 seconds (SD 262.1) and 495.7 seconds (SD 189.5) for the arthroscopic shoulder and knee assessments, respectively. One resident was noted to be more than 1.5 standard deviations slower than his peers on final knee arthroscopic testing whereas another resident was greater than 1.5 standard deviations faster than the mean for his final shoulder arthroscopic test.

**Discussion and Conclusions:** An arthroscopic testing model was able to measure a statistical improvement and define an acceptable range for a resident's arthroscopic skill after completing a clinical sports rotation. Instituting standardized cadaveric testing based on common orthopaedic surgical procedures such as knee and shoulder arthroscopy will not only ensure graduating residents possess the necessary skills to be technically proficient surgeons but it will also allow objective identification of residents in need of remediation.

### Poster 32

## Mechanism of Acute Elbow Dislocation

Joseph J. Schreiber, MD  
Russell F. Warren, MD  
Robert N. Hotchkiss, MD  
Aaron Daluiski, MD

**Introduction:** Acute elbow instability leading to dislocation is thought to be a spectrum initiated by an injury to the lateral stabilizing structures of the elbow and occurs between 58 and 78 degrees of elbow flexion. The purpose of this study was to analyze the position of the shoulder, elbow and forearm of patients sustaining an elbow dislocation. We hypothesized that based on prior biomechanical studies, the degree of elbow flexion at the time of dislocation would be >45 degrees.

**Methods:** Sixty-two videos posted on YouTube were identified each containing a clear videographic view of an elbow dislocation occurring during an athletic event. A dislocation was defined as a clear visual record of profoundly non-physiologic motion resulting in obvious deformity of the elbow. Arm position at the time of dislocation along with the suspected deforming forces at the elbow based upon these positions were independently evaluated by three senior elbow surgeons.

**Results:** Of the sixty-two visualized elbow dislocation events, the overwhelming majority of elbows dislocated while flexed <45 degrees (95%; 59 of 62) and most of these occurred at or near full extension. The most common position was abduction (97%, n=60) and forward flexion of the shoulder (63%, n=39) with the forearm in pronation (68%, n=42). The most common initial deforming forces at the elbow were a valgus moment (89%, n=55) and an axial load (90%, n=56). Most commonly the body was internally rotating (94%, n=58) on a planted forearm, resulting in a supination force being applied to a pronated forearm. Four discrete dislocation patterns were identified.

**Discussion:** Acute elbow dislocations occur in relative extension irrespective of forearm position. Elbow dislocations fall into one of four discrete patterns of shoulder, elbow, and forearm position and deforming force at the elbow. The initial deformity typically occurs with a valgus moment regardless of forearm position suggesting that the mechanism of an acute dislocation involves an initial and requisite disruption of the MCL. This study provides in vivo evidence of the mechanism of elbow dislocation that could lead to an improved understanding of the sequence of structural failure, modification of rehabilitation protocols and overall treatment.

## Poster 33

### Osteochondral Autograft Transplantation for Articular Defects in the Hand and Wrist

Paul Sibley, DO

\*Abdo Bachoura, MD

Randall W. Culp, MD

Sidney M. Jacoby, MD

**Introduction:** The osteochondral autograft transfer system procedure (OATS) has been described for osteochondral defects. We hypothesize that this procedure can be used for articular defects in the hand and wrist, with adequate functional results.

**Methods:** We performed a retrospective chart review of four male patients from May 2010 until February 2011 who had an OATS procedure for an articular defect of their hand or wrist. The average age was 30 years old and all had failed months of conservative management. The patients' injuries consisted of osteochondral defects in two proximal lunates, a proximal scaphoid, and an index metacarpal head. Outcome variables consisted of four month postoperative grip strength, range of motion, time to return to normal activity, and radiographic evidence of osteochondral plug in-growth.

**Results:** The average time from injury to surgery was 29 months, with an average follow-up of 5 months. Using our technique, we had no significant complications. The average gain of wrist motion was 6°, with wrist strength gaining an average of 18 PSI. Radiographic evidence of graft position and an improved articular surface was seen in all the cases by final follow-up. Every patient was happy with their result and would do it over again. All patients returned to their daily activities, including minor league baseball, golfing, and ice hockey.

**Discussion and Conclusion:** We recommend using this procedure in young, active patients with osteochondral defects of the hand and wrist. The OATS is a technically demanding procedure, but is a good first-line treatment option of focal osteochondral defects in higher demand individuals. It incorporates biomechanically superior hyaline cartilage into the articular defect, with capabilities for regrowth and regeneration. One can expect a successful outcome after a congruent articular surface is maintained and an adequate rehabilitation regimen is applied.

## Poster 34

### Defining "Irrigation and Debridement": A Lack of Consensus in the Literature

Daniel C. Smith, MD

Chris Sambaziotis, MD

Isaac Livshetz, BA

Sun J. Kim, MD

David M. Hirsh, MD

Yossef C. Blum, MD

**Introduction:** Acute postoperative and acute, late hematogenous prosthetic joint infections have been treated with one stage irrigation and debridement (I+D) with polyethylene exchange with variable success rates. Our previous study demonstrated effective treatment of a titanium disk coated with MRSA biofilm using chlorhexidine gluconate scrub. However, available literature suggests the potential for soft tissue damage using standard 4% chlorhexidine solution. The current study aims to identify a minimum chlorhexidine gluconate concentration for effective bacteria eradication of a simulated infected total joint prosthesis.

**Methods:** MRSA biofilms were grown on titanium disks simulating infected total joint prostheses using a clinically isolated MRSA strain in a liquid culture. Using a standardized cleansing technique, groups of 6 disks at a time were scrubbed using either buffer only or 4%, 2%, 1%, 0.5%, or 0.25% chlorhexidine solutions by the same technician. MRSA colonies were then counted and compared using the mean log colony-forming units (CFU) remaining on the disks following simulated I+D.

**Results:** All concentrations of chlorhexidine gluconate scrub produced a significant decrease in mean log CFU remaining on the disks following simulated I+D as compared to the control group ( $p < 0.05$ ). The 1% concentration chlorhexidine gluconate solution was the most effective at eradicating MRSA colonies.

**Conclusion:** As in our prior study, the current study demonstrates that chlorhexidine gluconate solution is more effective at treating MRSA biofilm on a titanium disk than is a control buffer solution. In addition, a 1% concentration of chlorhexidine gluconate solution was more effective at decreasing MRSA CFUs than was a 4% concentration solution. The beneficial effect on decreasing local side effects by using a minimal required concentration of chlorhexidine gluconate solution for effective I+D, while theoretical, requires further study.

Poster 35

## Pain During Office Removal of K Wires in Children

Scott Sorenson, MD  
William Hennrikus MD

**Introduction:** Closed reduction and K wire fixation for displaced supracondylar fractures in children is standard of care. This study evaluated pain when removing the K wires from the child's elbow in the clinic after the fracture healed.

**Methods:** 94 percutaneous K wires were removed from 45 patients (18 females, 27 males). Pain was measured using 2 pain scales: the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS; range 4-13) and the Wong-Baker FACES scale – a numbered pain – face scale from 0 to 5. At the time of K wire removal, each patient was given a lollipop and stickers. Antiseptic and Ethyl Chloride was applied to the skin. K wires were gently removed with pliers. The elbow was wrapped with a sterile dressing. Parents were instructed to remove the dressing in 3 days. The children were allowed to move the elbow ad lib and were held out of sports for 6 weeks.

**Results:** The ave patient age was 7.1 years. The ave CHEOPS was 6. 28 patients had a CHEOPS score of 6 or less. The ave FACES score was 2. 16 patients had a FACES score of 1 or less. Higher CHEOPS scores correlated with number of K wires removed and younger age. Insurance status, gender, and the specific family members present did not correlate with pain.

**Discussion and Conclusion:** K wire removal in the clinic in children is common. Pain associated with K wire removal and the safety of this practice has received scant study. 62% of our patients had little or no pain (CHEOPS 6 or less) and 36% had little or no self-reported pain (FACES scale 1 or less). Only 1 patient reported having severe pain (FACES: 5). K wire removal in children in the office setting is safe and acceptable practice.

Poster 36

## Kinematic Evaluation of the Multi-Directional Flexibility Properties of the STALIF-C: A Cadaveric Biomechanical Study

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Andres Cabezas, BS  
Roger B. Gaskins III, MD  
Brondon G. Santoni, PhD  
Antonio E. Castellvi, MD

**Purpose:** The STALIF-C is a no profile cervical interbody spacer with three integrated fixation screws designed to provide segmental rigidity in ACDF surgery. The purpose of this study was to biomechanically quantify the stabilizing effect of the STALIF-C, and compare these findings to those afforded by a standard 4-hole rigid anterior plate following instrumentation at the C5-C6 level. We hypothesized that the STALIF-C with integrated screws would afford comparable postoperative segmental rigidity to the standard interbody cage and anterior plate construct.

**Methods:** Six (n=6) human cadaveric cervical spines (C3-C7) were biomechanically evaluated using a non-destructive, non-constraining, pure-moment loading protocol with loads applied in flexion, extension, lateral bending (right + left), and axial rotation (left +right) for the intact and instrumented conditions. Spines were loaded quasi-statically up to 1.5 Nm in 0.5 Nm increments and range of motion (ROM) at the C5-C6 index level was recorded with the use of an opto-electronic motion analysis system. Each specimen was tested in the following conditions: 1. Intact (INT) 2. Discectomy + STALIF-C cage with integrated screws engaged (STA) 3. STALIF-C cage + Anterior Locking Plate (ALP) 4. STALIF-C cage only (CO).

**Results:** No statistically significant difference in range of motion at the C5-C6 level was identified between the STA and ALP groups in flexion, extension, lateral bending, or axial rotation (Figure 1). The STA group showed significant reductions in flexion/extension, lateral bending, and axial rotation ROM when compared to the CO group.

**Conclusions:** In this in-vitro biomechanical study, the STALIF-C cage with integrated screws provided comparable biomechanical stability to that of the standard interbody cage + anterior plate cervical spine fusion approach. Due to its no profile design, the STALIF-C device may avoid the morbidi-

ties associated with standard anterior plating while affording rigid fixation in a single level construct.

### Poster 37

## Biomechanical Analysis of External Fixation Pin Insertion Techniques

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 \*Sean Marvil, MD  
 Vilas Saldanha, MD  
 Hassan Shan, MD  
 David Hampton, MD  
 Gene Shaffer, MD  
 Solomon P. Samuel, DEng

**Introduction:** The optimum biomechanical performance of an external fixator depends on a number of factors, including pin placement from fracture site, pin-bar interface, pin diameter, insertion torque and the number of pins/bars used. There is a paucity of data regarding the ideal pin design and fixation technique to obtain the maximum immediate stiffness. Two popular methods of pin insertion include self-tapping bicortical or self-drilling unicortical pin placement. The aim of this biomechanical study was to evaluate the bending properties and stiffness of four pin fixation techniques.

**Methods:** Eight cadaver femurs were used and the diaphysis was osteotomized into three pieces. Each of these bone sections were instrumented with 5.0 mm half-pins using one of these four insertion methods: unicortical self-drilling (6 specimens), unicortical self-tapping (5), bicortical self-drilling (7) or bicortical self-tapping (6). Unicortical fixation was achieved by burying the pin tip in the far cortex while bicortical fixation demonstrated thread engagement of both cortices. Each construct was tested by applying a static axial load on each pin at a location of 2.5 cm from the near cortex. The stiffness and maximum bending strength for each construct was then calculated.

**Results:** Bicortical self-drilling pin constructs had the highest average bending strength (1174 N) and stiffness (291 Nmm). Bicortical self-tapping pins had the second highest average bending strength (1052 N) and stiffness (277 Nmm). However, there was no statistical difference between the bicortical self-drilling and self-tapping pins. Bicortical pins were statistically stiffer and had a greater maximum load to failure than unicortical pins.

**Discussion:** One of the primary goals of external fixation is to achieve short term fracture stability until definitive fixation. This study demonstrated that bicortical fixation of external fixation pins provides the best immediate biomechanical advantage regardless of self-tapping or self-drilling pins.

### Poster 38

## Stemmed Femoral Implants Show Lower Failure Rates in Revision TKA

Maria Vanushkina, BS, MS2  
 Kaan S. Irgit, MD  
 Kent Strohecker, MS  
 Charles L. Nelson, MD

**Introduction:** Most RTKA are performed on Medicare patients. The predicted dramatic increase in these procedures over the next few decades will place further strain on the already fragile US health care system. There is a need to examine the outcomes of contemporary RTKA to avoid costly re-revisions due to procedures with unacceptably high failure rates. Stemmed femoral implants are not universally used in RTKA, despite evidence that stems on both components improve outcomes. A specific efficacy comparison between the stemmed and stemless femoral revisions is not available in the literature. The goal of this study is to compare the re-revision rates between knees with stemmed and stemless femoral implants.

**Methods:** After IRB approval, the EHRs and x-rays of all knee revision cases (CPT 27486,27487) performed by 8 surgeons between 2004 and 2011 were retrospectively reviewed. 551 adult patients were identified. The x-rays were examined for pre-revision severity of bone loss. Revisions with hinged constrained components, those for primary knee infection, paraprosthesis fracture, unicompartmental to total conversion, polyethylene exchange only, partial replacements, and patients with less than two year follow up were excluded. Standard descriptive statistics,  $\chi^2$  analysis, independent t test for intergroup comparison, and risk ratios were calculated.

**Results:** The patients were divided into four subgroups based on implants used. The completely stemless group had the highest re-revision rate (60.71%), followed by the stemless femur-stemmed tibia group (46.67%), and the stemmed constrained condylar knee (14.29%). The fully stemmed group had the lowest re-revision rate (12.90%) which compares favorably with the other literature values.

**Discussion and Conclusion:** Stemmed femoral components significantly decreased re-revisions. We believe stemmed femoral implants should be implemented as a standard of care for all RTKAs to help avoid costly and painful re-revision procedures.

**Poster 39**

### Superficial Irrigation and Debridement: A Valid Procedure in Total Joint Arthroplasty

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Ronald Huang, BS  
Gregory K. Deirmengian, MD  
James J. Purtill, MD  
Matthew S. Austin, MD  
Javad Parvizi, MD, FRCS

**Introduction:** When persistent wound drainage after joint arthroplasty necessitates surgical debridement, the surgeon often encounters a superficial process without evidence of deep tissue penetration. While opening the deep tissues allows the surgeon to evaluate the deep space, it raises the potential for contamination in cases of isolated superficial infection. In order to establish its safety and efficacy, we evaluated the results of our cases of superficial irrigation and debridement (I&D) following total joint arthroplasty (TJA).

**Methods:** Using our institutional database, we identified 48 cases involving superficial I&D between January 2000 and March 2011. We defined failure as any subsequent procedure for infection involving the deep space. Medical records were used to collect operative and clinical data. In addition to establishing the success rate of superficial I&D, we performed a logistic regression analysis to identify predictors of failure.

**Results:** The success rate of superficial I&D was 85.4% (41/48). The success rate was 88.4% when the index procedure was a primary joint arthroplasty and 70.0% when the index procedure was a revision joint arthroplasty. Specimens were sent in 44 cases with 26 (59%) showing positive cultures. The presence of a sinus tract and elevated BMI were independent risk factors of failure. Age, Charlson Comorbidity Index, index procedure type, and intraoperative findings of hematoma, seroma, and purulence were not found to be related to risk of failure.

**Discussion and Conclusions:** When performing I&D for persistent drainage or hematoma acutely following joint arthroplasty, limiting the treatment to the superficial layer is

reasonable in the setting of intact deep tissues. However, the surgeon should consider treatment for presumed deep infection in patients with a sinus tract and in the morbidly obese. Given the high rate of positive cultures in the setting of superficial I&D, opening the deep space may pose a substantial risk of contamination, potentially increasing the risk of subsequent deep infection.

**Poster 40**

### Role of Magnetic Resonance Imaging in the Diagnosis and Management of Symptomatic Unicompartmental Knee Arthroplasty

Richard J. Yun, MA  
\*Anil S. Ranawat, MD  
Anthony Wong, BSc  
Anthony S. Chang, MD  
Anil T. Oommen, MBBS  
Andrew D. Pearle, MD

**Introduction:** Unicompartmental knee arthroplasty (UKA) is an established method for treatment of single compartment arthritis. However, a subset of patients present with continued pain after their procedure in the setting of a normal radiographic examination. We propose the use of magnetic resonance imaging (MRI) as a useful modality in determining the etiology of symptoms in unicompartmental knee arthroplasties.

**Methods:** An IRB-approved retrospective analysis of 300 consecutive UKAs between 2008-2010 found 25 cases symptomatic for continued pain (8.3%). Magnetic resonance imaging was performed with a 1.5 T Surface Coil unit after clinical and radiographic assessment. Image evaluation included assessment for osteoarthritis, synovitis, osteolysis, and loosening. A validated Patient Administered Questionnaire (PAQ), UCLA Activity Scale and WOMAC Index were used for clinical assessment.

**Results:** Imaging results indicated progressive arthritis in all 25 patients, synovitis in 15 patients (60.0%), osteolysis in 8 patients (32.0%), and loosening in 2 patients (8%). Revision or conversion to a TKR was advised for 8 patients and 15 were recommended for nonoperative therapies. Two patients were lost to follow-up. At a follow-up of  $1.4 \pm 0.9$  years, 3 of the 8 patients (37.5%) in the operative group experienced improvement in pain and function. Mean PAQ, UCLA and WOMAC index scores were  $8.0 \pm 1.4$  (7-9),  $5.5 \pm 6.4$  (1-10), and  $2.0 \pm 2.8$  (0-4), respectively. In the nonoperative group, 9

of the 15 patients (56.3%) experienced improvement in pain and function. Mean PAQ, UCLA and WOMAC index scores were  $7.6 \pm 3.7$  (0-10),  $5.9 \pm 3.2$  (1-10), and  $8.9 \pm 12.0$  (0-28), respectively.

**Discussion and Conclusion:** The use of MRI as an imaging modality for symptomatic arthroplasty patients is becoming more commonly used. This study supports the use of MRI as a diagnostic tool for the symptomatic UKA patient. It also shows how MRI with sound clinical judgment can affect treatment decisions.

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## **Individual Orthopaedic Instruction/ Multimedia Education**

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**Schedule:**

Thursday, June 21, 2012	4:35pm-5:35pm
Friday, June 22, 2012	3:00pm-4:00pm
Saturday, June 23, 2012	3:30pm-4:30pm

The following AAOS DVDs are available for individual viewing at the above times in the Speaker Ready Room:

1. **Anatomy of the Knee** (25 minutes)  
Stephen L. Brown, MD; Patrick M. Connor, MD; Donald F. D'Alessandro, MD; and James E. Fleischli, MD
2. **Pectoralis Major Transfer for Irreparable Rotator Cuff Tears** (11 minutes)  
Sumant G. Krishnan, MD and Kenneth C. Lin, MD
3. **Surgical Dislocation and Debridement for Femoro-Acetabular Impingement** (22 minutes)  
Christopher L. Peters, MD and Jill A. Erickson, PhD
4. **Hip Resurfacing: Direct Anterior Approach** (12 minutes)  
William J. Hozack, MD; Michael Nogler, MD; Stefan Kreuzer, MD; and Martin Krismer, MD
5. **Imageless Navigation in Hip Resurfacing Arthroplasty** (15 minutes)  
Michael L. Swank, MD and Amy L. Hallock, MEd
6. **Basics of Computer Navigation in Total Knee Arthroplasty** (11 minutes)  
James B. Stiehl, MD
7. **Lateral Approach for Valgus Total Knee Arthroplasty** (12 minutes)  
James B. Stiehl, MD
8. **Molded Articulating Cement Spacers for Treatment of Infected Total Knee Arthroplasty** (12 minutes)  
Adolph V. Lombardi Jr., MD, FACS; Keith R. Berend, MD; and Joanne B. Adams, BFA
9. **Arthroscopic Suprascapular Nerve Release** (23 minutes)  
Laurent Lafosse, MD
10. **Open Repair of Acute and Chronic Distal Biceps Ruptures** (25 minutes)  
James Michael Bennett, MD; Thomas Lynn Mehlhoff, MD; and James Burlin Bennett, MD
11. **Arthroscopic Acetabular Labral Repair: Surgical Technique** (9 minutes)  
Marc J. Philippon, MD; Mike J. Huang, MD; Karen K. Briggs, MPH; and David A. Koppersmith, BS
12. **Anterior Cruciate Ligament Reconstruction Using Achilles Allograft and Interference Screws** (10 minutes)  
Colin G. Looney, MD and William I. Sterett, MD

13. **Osteochondral Lesion of the Talus (OLT): Technique of Osteochondral Autologous Graft Transfer** (11 minutes)  
Sameh A. Labib, MD and Brett Sweitzer, MD
14. **Revision ACL Reconstruction Using the Anatomic Double Bundle Concept** (14 minutes)  
Freddie H. Fu, MD; Nicholas J. Honkamp, MD; Wei Shen, MD, PhD; Anil S. Ranawat, MD; and Fotios P. Tjoumikaris, MD
15. **The Krukenberg Procedure for Children** (25 minutes)  
Hugh Godfrey Watts, MD; John F. Lawrence, MD; and Joanna Patton, ROT
16. **Single Incision Direct Anterior Approach to Total Hip Arthroplasty** (13 minutes)  
William J. Hozack, MD; Michael Nogler, MD; Javad Parvizi, MD; Eckart Mayr, MD; and Krismer Martin, MD
17. **Medial Patellofemoral Ligament Reconstruction** (13 minutes)  
Ryan E. Dobbs, MD; Patrick E. Greis, MD; and Robert T. Burks, MD
18. **Hip Arthroscopy: Operative Set-Up and Anatomically Guided Portal Placement** (8 minutes)  
Allston Julius Stubbs, MD; Karen Briggs, MBA; and Marc J. Philippon, MD
19. **Anatomy of the Shoulder** (24 minutes)  
Donald F. D'Alessandro, MD
20. **Anterolateral Approach in Minimally Invasive Total Hip Arthroplasty** (18 minutes)  
Leonard Remia, MD
21. **Patient Specific Knee Design: An Evolution in Computer-Assisted Surgery** (22 minutes)  
Adolph V. Lombardi, MD; Keith R. Berend, MD; and Joanne B. Adams, BFA
22. **Hemiarthroplasty for a Comminuted Fracture of the Proximal Humerus** (20 minutes)  
Jon J. P. Warner, MD; Darren J. Friedman, MD; Zachary R. Zimmer, BA; and Laurence D. Higgins, MD
23. **Rotator Interval Repair of the Shoulder: Biomechanics and Technique** (7 minutes)  
Matthew T. Provencher, MD and Daniel J. Solomon, MD
24. **Excision of Calcaneonavicular Tarsal Coalition** ( 7 minutes)  
Maurice Albright, MD; Brian Grottkau, MD; and Gleeson Rebello, MD
25. **Extensile Surgical Approach for the Resection of Large Tumors of the Axilla and Brachial Plexus** (9 minutes)  
James C. Wittig, MD; Alex R. Vap, BA; Camilo E. Villalobos, MD; Brett L. Hayden, BA; Andrew M. Silverman, BA; and Martin M. Malawer, MD
26. **The Anterior Supine Intermuscular Approach in Primary Total Hip Arthroplasty** (18 minutes)  
Keith R. Berend, MD; Adolph V. Lombardi Jr., MD; and Joanne B. Adams, BFA, CMI
27. **Robotic Arm-Assisted Unicompartmental Knee Arthroplasty: An Introductory Guide** (15 Minutes)  
Christopher John Dy, MD; Kristofer Jones, MD; Samuel Arthur Taylor, MD; Anil Ranawat, MD; and Andrew D. Pearle, MD

28. **Vertical Humeral Osteotomy for the Revision of Humeral Components in Shoulder Arthroplasty** (21 minutes)  
Geoffrey Van Thiel, MD; Gregory P. Nicholson, MD; James Patrick Halloran, MD; Dana Piasecki, MD; Matthew T. Provencher, MD; and Anthony A. Romeo, MD
29. **Techniques for Safe Portal Placement in the Shoulder: The Ring of Fire** (13 minutes)  
Keith D. Nord, MD; Bradford A. Wall, MD; Prithviraj Chavan, MD; and William H. Garrett, BS
30. **Reconstruction of the Medial Collateral Ligament of the Elbow** (12 minutes)  
James Michael Bennett, MD; Thomas Lynn Melhoff, MD; and Rodney K. Baker
31. **Reconstruction of Abductor Mechanism-Gluteus Maximus Flap Transfer** (15 minutes)  
Leo Whiteside, MD and Marcel Roy, PhD
32. **Kinematic Alignment with Modified Conventional Instruments Instead of Patient-Specific Guides** (26 minutes)  
Stephen Howell, MD
33. **Arthroscopic Management of Femoroacetabular Impingement** (12 minutes)  
J. W. Thomas Byrd, MD
34. **Arthroscopic Suprascapular Nerve Decompression: Etiology, Diagnosis, and Surgical Technique** (21 minutes)  
Sanjeev Bhatia, MD; Adam B. Yanke, MD; Neil S. Ghodadra, MD; Seth Sherman, MD; Anthony A. Romeo, MD; and Nikhil N. Verma, MD
35. **Combined Cartilage Restoration and Distal Realignment for Patellar and Trochlear Chondral Lesions** (12 minutes)  
Peter Chalmers, MD; Adam B. Yanke, MD; Seth Sherman, MD; Vasili Karas, BS; and Brian Cole, MD, MBA
36. **Simple Arthroscopic Anterior Capsulo-Labral Reconstruction of the Shoulder** (17 minutes)  
Stephen J. Snyder, MD and Jeffrey D. Jackson, MD
37. **Proximal Humerus Resection for Parosteal Osteosarcoma** (16 minutes)  
Yvette Ho, MD; Camilo E. Villalobos, MD; and James C. Wittig, MD

**Multimedia Financial Disclosure**

Eastern Orthopaedic Association has identified the option to disclose as follows.

The following participants have disclosed whether they or a member of their immediate family:

1. Receive royalties for any pharmaceutical, biomaterial, or orthopaedic product or device;
2. Within the past twelve months, served on a speakers’ bureau or have been paid an honorarium to present by any pharmaceutical, biomaterial, or orthopaedic product or device company;
- 3a. Paid Employee for any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier;
- 3b. Paid Consultant for any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier;
- 3c. Unpaid Consultant for any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier;
4. Own stock or stock options in any pharmaceutical, biomaterial, or orthopaedic device and equipment company, or supplier (excluding mutual funds);
5. Receive research or institutional support as a principal investigator from any pharmaceutical, biomaterial, orthopaedic device and equipment company, or supplier;
6. Receive any other financial/material support from any pharmaceutical, biomaterial, or orthopaedic device and equipment company or supplier;
7. Receive any royalties, financial/material support from any medical and/or orthopaedic publishers;
8. Serves on the editorial or governing board of any medical and/or orthopaedic publication;
9. Serves on any Board of Directors, as an owner or officer, on a relevant committee of any health care organization (e.g., hospital, surgery center, medical).
- n. No conflicts to disclose.

The Academy does not view the existence of these disclosed interests or commitments as necessarily implying bias or decreasing the value of the author’s participation in the meeting

Joanne B. Adams, BFA (n.)
Maurice Albright, MD (n.)
Rodney K. Baker (n.)
James Burlin Bennett, MD (2. <i>Ascension Orthopedics</i> ; 3b. <i>Ascension Orthopedics</i> ; 5. <i>Ascension Orthopedics</i> )
James Michael Bennett, MD (9. <i>AAOS</i> )
Keith R. Berend, MD (1. <i>Biomet</i> ; 3b. <i>Biomet, Salient Surgical</i> ; 5. <i>Biomet, Salient Surgical</i> ; 8. <i>Clinical Orthopaedics and Related Research, Journal of Arthroplasty, Journal of Bone and Joint Surgery – American, Orthopedics</i> ; 9. <i>American Association of Hip and Knee Surgeons</i> )
Sanjeev Bhatia, MD (n.)
Karen K. Briggs, MPH, MBA (5. <i>Ossur, Smith &amp; Nephew, Arthrex, Inc., Siemens</i> )
Stephen L. Brown, MD (n.)
Robert T. Burks, MD (1. <i>Arthrex, Inc.</i> ; 2. <i>Arthrex, Inc.</i> ; 3b. <i>Arthrex, Inc.</i> ; 9. <i>Arthroscopy Association of North America</i> )

J. W. Thomas Byrd, MD (3b. <i>Smith &amp; Nephew, A2 Surgical</i> ; 4. <i>A2 Surgical</i> ; 5. <i>Smith &amp; Nephew</i> ; 7. <i>Springer</i> ; 9. <i>Arthroscopy Association of North America, American Orthopaedic Society for Sports Medicine, International Society of Arthroscopy, Knee Surgery, Orthopaedic Sports Medicine</i> )
Peter Chalmers, MD (n.)
Prithviraj Chavan, MD (5. <i>Arthrex, Inc., Smith &amp; Nephew, DePuy, Synthes</i> )
Brian Cole, MD, MBA (1. <i>Arthrex, Inc.; DJ Orthopaedics, Lippincott, Elsevier</i> ; 2. <i>Genzyme</i> ; 3b. <i>Zimmer, Arthrex, Inc.; Carticept, Biomimetic, Allosource, DePuy</i> ; 5. <i>Regentis, Arthrex, Smith &amp; Nephew, DJ Ortho</i> ; 7. <i>Lippincott, Elsevier, WB Saunders</i> ; 8. <i>JBJS, AJSM, Cartilage, JSES, AJO, Elsevier</i> )
Patrick M. Connor, MD (1. <i>Biomet</i> ; 3b. <i>Zimmer</i> ; 9. <i>NFLPS, OrthoCarolina Research Institute</i> )
Donald F. D'Alessandro, MD (3b. <i>Biomet Sports Medicine</i> )
Ryan E. Dobbs, MD (4. <i>Orthopaedic Implant Company</i> )
Christopher John Dy, MD (n.)

Jill A. Erickson, PA-C (n.)
James E. Fleischli, MD (5. Biomet)
Darren J. Friedman, MD (2. Allen Medical, Arthrex, Inc.; 3b. Allen Medical)
Freddie H. Fu, MD (1. Arthrocare; 3a. Stryker; 4. Stryker; 7. SLACK Incorporated; 8. Saunders/Mosby-Elsevier; 9. AAOS, American Orthopaedic Society for Sports Medicine, International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine, Orthopaedic Research and Education Foundation)
William H. Garrett, BS (n.)
Neil S. Ghodadra, MD (n.)
Patrick Greis, MD (4. Merck)
Brian Grottkau, MD (9. AAOS)
Amy L. Hallock, MEd (n.)
James Patrick Halloran, MD (n.)
Brett L. Hayden, BA (n.)
Laurence D. Higgins, MD (6. Arthrex, Inc., Smith & Nephew, Breg, DePuy; 9. American Shoulder and Elbow Surgeons, Arthroscopy Association of North America)
Yvette Ho, MD (6. imedicalapps.com)
Nicholas J. Honkamp, MD (n.)
Stephen Howell, MD (1. Biomet; 2. Biomet, Stryker; 3b. Biomet, Stryker; 5. Stryker; 7. Saunders/Mosby-Elsevier; 8. Knee, American Journal of Sports Medicine; 9. International Society of Arthroscopy, Knee Surgery, Orthopaedic Sports Medicine)
William J. Hozack, MD (1. Stryker; 3b. Stryker; 5. Stryker; 8. Journal of Arthroplasty; 9. Hip Society)
Michael Huang, MD (6. Genzyme, Smith & Nephew)
Jeffrey D. Jackson, MD (3a. Arthrex, Inc.)
Kristofer Jones, MD (n.)
Vasili Karas, BS (n.)
Stefan Kreuzer, MD (1. Smith & Nephew, Synvasive; 2. Corin USA, Stryker, Salient Surgical, MAKO; 3b. Corin USA, Stryker, Salient Surgical, MAKO; 5. MAKO, Synvasive, Corin USA)
Sumant G. Krishnan, MD (1. Innovation Sports; 3b. Mitek, Tornier; 4. Johnson & Johnson, Pfizer, Merck; 6. Mitek, Tornier)
Martin Krismer, MD (6. Stryker Orthopaedics)
David A. Koppersmith, BS (n.)
Sameh A. Labib, MD (2. Arthrex, Inc.; 4. ConforMIS, Inc., Zimmer; 9. AAOS, American Orthopaedic Foot and Ankle Society)
Laurent Lafosse, MD (1. TAG; 2. TAG; 3b. TAG; 3c. TAG; 5. TAG)
John F. Lawrence, MD (n.)
Kenneth C. Lin, MD (n.)
Adolph V. Lombardi Jr, MD, FACS (6. Biomet, Medtronic, GlaxoSmithKline, Merck, Tornier, Allergan, New Albany Surgical Hospital, Pivotal Research Solutions, Inc.)
Colin G. Looney, MD (n.)

Martin M. Malawer, MD (n.)
Krismer Martin, MD (n.)
Eckart Mayr, MD (2. Stryker; 3b. Stryker; 5. Stryker)
Thomas L. Mehlhoff, MD (n.)
Gregory P. Nicholson, MD (1. Innomed, Zimmer; 3b. Zimmer, Tornier; 4. Zimmer; 5. EBI, Tornier, Zimmer; 7. SLACK Incorporated)
Michael M. Nogler, MD (2. Stryker; 3b. Stryker; 5. Stryker Heraeus; 7. Springer)
Keith D. Nord, MD (1. Arthrex, Inc.; 2. Smith & Nephew, Cayenne; 3b. Smith & Nephew, Cayenne; 4. Bledsoe; 5. DePuy, Synthes, Smith & Nephew, Zimmer, Arthrex, Inc.)
Dana Piasecki, MD (n.)
Javad Parvizi, MD, FRCS (3b. Biomet, Covidien, National Institutes of Health (NIAMS & NICHD), Salient Surgical, Smith & Nephew, Stryker, TissueGene, Zimmer; 5. 3M, Musculoskeletal Transplant Foundation, National Institutes of Health (NIAMS & NICHD), Stryker, Zimmer; 7. Saunders/Mosby-Elsevier, SLACK Incorporated, Wolters Kluwer Health - Lippincott Williams & Wilkins; 8. American Journal of Orthopedics, Current Opinion in Orthopaedics, International Orthopaedics, Journal of Bone and Joint Surgery - American, Journal of Bone and Joint Surgery - British, Journal of the American Academy of Orthopaedic Surgeons, Orthopedics Today, SLACK Incorporated; 9. American Association of Hip and Knee Surgeons, American Board of Orthopaedic Surgery, Inc., British Orthopaedic Association, CD Diagnostics, Eastern Orthopedic Association, Hip Society, Orthopaedic Research and Education Foundation, Orthopaedic Research Society, SmartTech, United Healthcare)
Joanna Patton, ROT (n.)
Andrew D. Pearle, MD (n.)
Christopher L. Peters, MD (1. Biomet; 2. Biomet; 3b. Biomet; 8. Journal of Arthroplasty; 9. AAOS)
Marc J. Philippon, MD (1. Smith & Nephew, Bledsoe, Donjoy, ArthroSurface; 3b. Smith & Nephew; 4. ArthroSurface, Hipco, MIS; 5. Ossur, Arthrex, Siemens, Smith & Nephew; 6. Smith & Nephew; 7. SLACK Incorporated, Elsevier; 9. International Society for Hip Arthroscopy, AOSSM, Steadman Philippon Research Institute)
Matthew T. Provencher, MD (8. Arthroscopy, BMC Musculoskeletal Disorders, Knee, Orthopedics, SLACK Incorporated, Vindico Orthopaedic Hyperguide; 9. AAOS, American Orthopaedic Society for Sports Medicine, American Shoulder and Elbow Surgeons, Arthroscopy Association of North America, International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine, San Diego Shoulder Institute, Society of Military Orthopaedic Surgeons)
Anil Ranawat, MD (4. MAKO, ConforMIS)
Gleeson Rebello, MD (n.)
Leonard Remia, MD (3b. Encore Medical; 6. Encore Medical)
Anthony A. Romeo, MD (1. Arthrex, Inc.; 2. Arthrex, Inc., DJ Orthopaedics, Joint Restoration Foundation; 3b. Arthrex, Inc.; 5. Arthrex, Inc., DJ Orthopaedics; 6. Arthrex, Inc., DJ Orthopaedics; 7. Saunders/Mosby-Elsevier; 8. Arthroscopy, Journal of Shoulder and Elbow Surgery, SLACK Incorporated, Wolters Kluwer Health - Lippincott Williams & Wilkins; 9. American Orthopaedic Society for Sports Medicine, American Shoulder and Elbow Surgeons, Arthroscopy Association of North America)
Marcel Roy, PhD (3c. Signal Medical Corp.)

Wei Shen, MD, PhD (n.)
Seth Sherman, MD (n.)
Andrew M. Silverman, BA (n.)
Stephen J. Snyder, MD (1. Arthrex, Inc., DJ Orthopaedics, Linvatec, Sawbones/Pacific Research Laboratories, Wright Medical Technology, Inc.; 3a. Redyns Medical; 3b. Synthes; 4. Redyns Medical, Johnson & Johnson, Wright Medical; 7. Wolters Kluwer Health - Lippincott Williams & Wilkins)
Daniel J. Solomon, MD (2. Arthrex, Inc., Pacific Medical; 8. Arthroscopy, American Orthopedic Sports Medicine Society Sports Medicine Update; 9. AAOS, American Orthopaedic Society for Sports Medicine, Society of Military Orthopaedic Surgeons)
William I. Sterett, MD (1. Biomet; 3b. Arthrex, Inc.; 5. Arthrex, Inc., Smith & Nephew, Ossur, Siemens)
James B. Stiehl, MD (1. Zimmer, Innomed; 2. Blue Orthopaedics Computer Company, Zimmer; 3b. Blue Orthopaedics Computer Company, Zimmer; 3c. Exactech, Inc.; 4. Blue Orthopaedics Computer Company, Traumis, Inc. Technology Company; 8. Knee, Journal of Arthroplasty)
Allston J. Stubbs, MD (3b. Smith & Nephew; 4. Johnson & Johnson, Inc.; 5. Bauerfeind, AG; 8. VuMedi.com, Journal of Arthroscopy; 9. International Society for Hip Arthroscopy, American Orthopaedic Society for Sports Medicine, Arthroscopy Association of North America)
Michael L. Swank, MD (3b. Brainlab, DePuy; 6. Brainlab, DePuy)
Brett A. Sweitzer, MD (n.)

Samuel Arthur Taylor, MD (n.)
Fotios P. Tjoumakaris, MD (2. Ferring Pharmaceutical)
Geoffrey S. Van Thiel, MD (n.)
Alex R. Vap, BA (n.)
Nikhil N. Verma, MD (1. Smith & Nephew; 3b. Smith & Nephew; 4. Omeros; 5. Arthrex, Inc., Smith & Nephew, Athletico, ConMed Linvatec, Miomed, Mitek; 7. Vindico Medical-Orthopedics Hyperguide, Arthroscopy; 8. Journal of Knee Surgery, Arthroscopy, SLACK Incorporated; 9. American Orthopaedic Society for Sports Medicine, Arthroscopy Association Learning Center Committee)
Camilo E. Villalobos, MD (n.)
Bradford A. Wall, MD (n.)
Jon J. P. Warner, MD (1. Zimmer, Tornier; 6. Arthrocare, DJ Orthopaedics, Arthrex, Inc., Mitek, Breg, Smith & Nephew)
Hugh Godfrey Watts, MD (n.)
Leo Whiteside, MD (1. Smith & Nephew, Stryker; 2. Smith & Nephew; 3b. Signal Medical Corp.; 3c. Smith & Nephew; 4. Signal Medical Corp.; 8. Journal of Arthroplasty, Clinical Orthopaedics and Related Research, Journal of Orthopaedics and Traumatology)
James C. Wittig, MD (n.)
Adam B. Yanke, MD (n.)
Zachary R. Zimmer, BA (n.)





## Eastern Orthopaedic Association

43<sup>rd</sup> Annual Meeting

June 21-23, 2012

The Sagamore  
Bolton Landing, New York

### 2012 CME Credit Record

#### Multimedia Education

**Instructions:** To ensure correct CME credit is awarded, please complete this form, indicating the DVDs you watched. Return this form to the EOA Registration Desk or complete the Credit Record online at [www.eoa-assn.org](http://www.eoa-assn.org). This form may also be mailed to EOA, 110 West Road, Suite 227, Towson, MD 21204. CME Certificates will be awarded to all registered participants. Unless you have provided a legible email address, please allow up to 30 days to receive your CME certificate.

**Please Print:**

*Name:* \_\_\_\_\_ *AAOS Member #:* \_\_\_\_\_

*Address:* \_\_\_\_\_

*City:* \_\_\_\_\_ *State:* \_\_\_\_\_ *Zip:* \_\_\_\_\_

*Phone:* \_\_\_\_\_ *Fax:* \_\_\_\_\_

*Email Address:* \_\_\_\_\_

*Thank you for your cooperation.*

## 2012 CME Credit Record Multimedia Education

Please place an  $\times$  in the box by each DVD viewed and write any comments you may have in the space provided.  
You will be awarded hour per hour credit for time of participation.

### Multimedia Sessions attended:

(Please check the boxes of the DVDs you viewed).

- |  |  |  |  |
|--|--|--|--|
| <input type="checkbox"/> DVD 1 (25 min)  | <input type="checkbox"/> DVD 11 (9 min)  | <input type="checkbox"/> DVD 21 (22 min) | <input type="checkbox"/> DVD 31 (15 min) |
| <input type="checkbox"/> DVD 2 (11 min)  | <input type="checkbox"/> DVD 12 (10 min) | <input type="checkbox"/> DVD 22 (20 min) | <input type="checkbox"/> DVD 32 (26 min) |
| <input type="checkbox"/> DVD 3 (22 min)  | <input type="checkbox"/> DVD 13 (11 min) | <input type="checkbox"/> DVD 23 (7 min)  | <input type="checkbox"/> DVD 33 (12 min) |
| <input type="checkbox"/> DVD 4 (12 min)  | <input type="checkbox"/> DVD 14 (14 min) | <input type="checkbox"/> DVD 24 (7 min)  | <input type="checkbox"/> DVD 34 (21 min) |
| <input type="checkbox"/> DVD 5 (15 min)  | <input type="checkbox"/> DVD 15 (25 min) | <input type="checkbox"/> DVD 25 (9 min)  | <input type="checkbox"/> DVD 35 (12 min) |
| <input type="checkbox"/> DVD 6 (11 min)  | <input type="checkbox"/> DVD 16 (13 min) | <input type="checkbox"/> DVD 26 (18 min) | <input type="checkbox"/> DVD 36 (17 min) |
| <input type="checkbox"/> DVD 7 (12 min)  | <input type="checkbox"/> DVD 17 (13 min) | <input type="checkbox"/> DVD 27 (15 min) | <input type="checkbox"/> DVD 37 (16 min) |
| <input type="checkbox"/> DVD 8 (12 min)  | <input type="checkbox"/> DVD 18 (8 min)  | <input type="checkbox"/> DVD 28 (21 min) |  |
| <input type="checkbox"/> DVD 9 (23 min)  | <input type="checkbox"/> DVD 19 (24 min) | <input type="checkbox"/> DVD 29 (13 min) |  |
| <input type="checkbox"/> DVD 10 (25 min) | <input type="checkbox"/> DVD 20 (18 min) | <input type="checkbox"/> DVD 30 (12 min) |  |

Please indicate the DVD(s) you found to be most meaningful and any comments. Begin with the DVD number.

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Please indicate any feedback that you may have concerning other DVDs. Begin with the DVD number.

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Please indicate any comments or suggestions that you have regarding the Multimedia Presentations.

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## Eastern Orthopaedic Association

43rd Annual Meeting

June 21-23, 2012

The Sagamore  
Bolton Landing, New York

### 2012 CME Credit Record

#### Scientific Program

**Instructions:** To ensure correct CME credit is awarded, please complete this form, indicating the Sessions you attended. Return this form to the EOA Registration Desk or go online to [www.eoa-assn.org](http://www.eoa-assn.org) to complete the Credit Record. This form may also be mailed to EOA, 110 West Road, Suite 227, Towson, MD 21204. CME certificates will be awarded to all registered participants. Unless you have provided a legible email address, please allow up to 30 days to receive your CME certificate.

**Please Print:**

*Name:* \_\_\_\_\_ *AAOS Member #:* \_\_\_\_\_

*Address:* \_\_\_\_\_

*City:* \_\_\_\_\_ *State:* \_\_\_\_\_ *Zip:* \_\_\_\_\_

*Phone:* \_\_\_\_\_ *Fax:* \_\_\_\_\_

*Email Address:* \_\_\_\_\_

*Thank you for your cooperation.*

## 2012 CME Credit Record Scientific Program

Please rate by checking the box corresponding to the appropriate number. 5 = Excellent 4 = Good 3 = Satisfactory 2 = Fair 1 = Poor

### Thursday, June 21, 2012

Sessions	Check if Attended	Presented objective balanced, & scientifically rigorous content	Achieved stated objectives	Satisfied my educational and/or professional needs
<i>General Session I</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Symposia I</i> or <i>Concurrent Session II</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Session III</i> or <i>Concurrent Session IV</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>General Session V</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Symposia II</i> or <i>Concurrent Symposia III</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Symposia IV</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

### Friday, June 22, 2012

Sessions	Check if Attended	Presented objective balanced, & scientifically rigorous content	Achieved stated objectives	Satisfied my educational and/or professional needs
<i>General Session VI</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Symposia V</i> or <i>Concurrent Symposia VI</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Session VII</i> or <i>Concurrent Session VIII</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>General Session IX</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Symposia VII</i> or <i>Concurrent Symposia VIII</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

### Saturday, June 23, 2012

Sessions	Check if Attended	Presented objective balanced, & scientifically rigorous content	Achieved stated objectives	Satisfied my educational and/or professional needs
<i>General Session X</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Session XI</i> or <i>Concurrent Session XII</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Session XIII</i> or <i>Concurrent Session XIV</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Symposium IX</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>General Session XV</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Symposia X</i> or <i>Concurrent Symposia XI</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Concurrent Session XVI</i> or <i>Concurrent Session XVII</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
<i>Symposium XII</i>	<input type="checkbox"/>	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1



## Eastern Orthopaedic Association

43<sup>rd</sup> Annual Meeting

June 21-23, 2012

The Sagamore  
Bolton Landing, New York

### 2012 CME Credit Record

#### Poster Presentations

**Instructions:** To ensure correct CME credit is awarded, please complete this form, indicating the posters viewed. Return this form to the EOA Registration Desk or go online to [www.eoa-assn.org](http://www.eoa-assn.org) to complete the Credit Record. This form may also be mailed to EOA, 110 West Road, Suite 227, Towson, MD 21204. CME certificates will be awarded to all registered participants. Unless you have provided a legible email address, please allow up to 30 days to receive your CME certificate.

**Please Print:**

*Name:* \_\_\_\_\_ *AAOS Member #:* \_\_\_\_\_

*Address:* \_\_\_\_\_

*City:* \_\_\_\_\_ *State:* \_\_\_\_\_ *Zip:* \_\_\_\_\_

*Phone:* \_\_\_\_\_ *Fax:* \_\_\_\_\_

*Email Address:* \_\_\_\_\_

*Thank you for your cooperation.*

## 2012 CME Credit Record Poster Presentations

Please indicate posters viewed and include comments in the space provided. Each poster viewed will account for 10 minutes of CME credit. There is a maximum of 3 CME credits available during the course of the meeting for viewing posters (or a total of 18 posters).

### Poster Sessions attended:

(Please check the boxes of the poster sessions you attended).

- |                             |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <input type="checkbox"/> 1  | <input type="checkbox"/> 11 | <input type="checkbox"/> 21 | <input type="checkbox"/> 31 |
| <input type="checkbox"/> 2  | <input type="checkbox"/> 12 | <input type="checkbox"/> 22 | <input type="checkbox"/> 32 |
| <input type="checkbox"/> 3  | <input type="checkbox"/> 13 | <input type="checkbox"/> 23 | <input type="checkbox"/> 33 |
| <input type="checkbox"/> 4  | <input type="checkbox"/> 14 | <input type="checkbox"/> 24 | <input type="checkbox"/> 34 |
| <input type="checkbox"/> 5  | <input type="checkbox"/> 15 | <input type="checkbox"/> 25 | <input type="checkbox"/> 35 |
| <input type="checkbox"/> 6  | <input type="checkbox"/> 16 | <input type="checkbox"/> 26 | <input type="checkbox"/> 36 |
| <input type="checkbox"/> 7  | <input type="checkbox"/> 17 | <input type="checkbox"/> 27 | <input type="checkbox"/> 37 |
| <input type="checkbox"/> 8  | <input type="checkbox"/> 18 | <input type="checkbox"/> 28 | <input type="checkbox"/> 38 |
| <input type="checkbox"/> 9  | <input type="checkbox"/> 19 | <input type="checkbox"/> 29 | <input type="checkbox"/> 39 |
| <input type="checkbox"/> 10 | <input type="checkbox"/> 20 | <input type="checkbox"/> 30 | <input type="checkbox"/> 40 |

Please indicate the poster(s) you found to be most meaningful and any comments. Begin with the poster number.

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Please indicate any feedback that you may have concerning other posters. Begin with the poster number.

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Please indicate any comments or suggestions that you have regarding the Poster Presentations.

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**2012 Overall Scientific Evaluation**

Your feedback is critical to program planning and future course development. Please take a few minutes to complete and return this evaluation form to the registration desk prior to departure.

<b>Why did you choose to attend this Meeting?</b>	<b>High Importance</b>	<b>Some Importance</b>	<b>Little Importance</b>	<b>No Importance</b>
Course Topic(s) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learning Method(s) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program Faculty . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Location of Program . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Timeliness . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtaining CME Credit . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poster Presentations . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How did we do overall?</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Course Educational Objectives . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical Application to Practice . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Faculty Selection . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to Interact with Faculty . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Course Syllabus . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to Ask Questions . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lighting, Seating, and General Environment . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Course Length . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Registration Fee . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refreshment Breaks, Food and Beverages . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lodging Accommodations . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of Lodging Accommodations . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Course Rating . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How did we do on Poster Presentations?</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Poster Educational Objectives . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical Application to Practice . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to Interact with Poster Presenter/Co-Author . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poster Syllabus Material . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to Ask Questions . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poster Location . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How did we do on Multimedia?</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Multimedia Educational Objectives . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical Application to Practice . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DVD Selection . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multimedia Location . . . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





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**2013 Needs Assessment Survey**

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**Please list any medical topics that you would like included in future programs planned by EOA.**

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**Please list any Office Management Topics that you would like included in the program.**

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