100th Anniversary Meeting

September 13 - 15, 2012
The Palmer House Hilton
Chicago, Illinois

SYLLABUS
& MEMBERSHIP DIRECTORY
EXHIBITORS

Gold Level
DePuy Orthopaedics
Medstrat

Silver Level
Shriners Hospitals for Children

Bronze Level
Biocomposites, Inc.
Biomet Orthopaedics
CeramTec
Hapad
MAKO Surgical Corp.
McKesson
Medtronic Advanced Energy
Nutramax Laboratories, Inc.
Smith & Nephew
SRSsoft
Stryker Orthopaedics
Zimmer Daniel

Sponsors
Ortho-Preferred
Swanson Martin & Bell, LLP

Exhibitors

Angiotech
Biocomposites, Inc.
Biomet Orthopaedics
CeramTec
DePuy Orthopaedics
Elsevier USA
Hapad, Inc
Janssen Pharmaceuticals
MAKO Surgical Corp.
McKesson
Medstrat
Medtronic Advanced Energy
Nutramax Laboratories, Inc.
Orthopaedic Research and Education Foundation
ProScan Reading Services
Shriners Hospitals for Children
Smith & Nephew
SRSsoft
Stryker Orthopaedics
Zimmer Daniel

Commercial Support
Arthrex
DePuy Orthopaedics
Zimmer, Inc.

Please see product descriptions beginning on page 179
TABLE OF CONTENTS

Officers .................................................................................................................. 2
Committees ........................................................................................................... 3
Past Presidents .................................................................................................... 4
Past Meetings ....................................................................................................... 5
Dr. & Mrs. J. Elmer Nix Ethics Award ................................................................. 6
Mission Statement, Vision and Values .............................................................. 7
President’s Message ............................................................................................ 8
Abridged October 7, 1988 Address ................................................................. 9
Course Objectives and Accreditation ............................................................... 11
Distinguished Invited Speakers ........................................................................ 12
Faculty and Disclosures ...................................................................................... 13
Scientific Program ............................................................................................... 19
Meeting Abstracts
   Thursday, September 13 .................................................................................. 23
   Friday, September 14 ....................................................................................... 43
   Saturday, September 15 ................................................................................. 61
Paper Abstracts ................................................................................................... 71
New Members ..................................................................................................... 99
Necrology List ................................................................................................... 100
Directory, alphabetical listing ........................................................................... 105
Directory, geographical listing .......................................................................... 157
Bylaws ................................................................................................................ 165
Exhibitors’ Product Descriptions ..................................................................... 179

FUTURE MEETINGS

Buffalo Niagara, NY ........................................................................................... September 19-21, 2013
2011-2012 OFFICERS & DIRECTORS

PRESIDENT
Bess E Brackett, MD

FIRST PRESIDENT-ELECT
William C. Warner, Jr., MD

SECOND PRESIDENT-ELECT
Robert M. Peroutka, MD

SECRETARY-TREASURER
Ricardo J. Rodriguez, MD

LIBRARIAN-HISTORIAN
Dabney Y. Hofammann, MD

IMMEDIATE PAST PRESIDENT
L. Andrew Koman, MD

PAST PRESIDENT
Frederick N. Meyer, MD

MEMBERS AT LARGE
Charles T. Fletcher, Jr., MD
John E. Garber, MD
Thomas N. Joseph, MD
James A. Slough, MD

PROGRAM CHAIR
Pietro Tonino, MD

CLINICAL ORTHOPAEDIC SOCIETY
ADMINISTRATIVE OFFICE
2209 Dickens Road • Richmond, VA 23230-2005
(804) 565-6366 • FAX: (804) 282-0090
E-mail: cos@societyhq.com • www.cosociety.org

EXECUTIVE DIRECTOR
Stewart Hinckley, CMP

ASSOCIATION ADMINISTRATOR
Julie Hitt
2011-2012 CLINICAL ORTHOPAEDIC SOCIETY COMMITTEES

MEMBERSHIP COMMITTEE
Bess E Brackett, MD - Chair
William C. Warner, Jr., MD
Animesh Agarwal, MD (exp. 2012)
Scott Hodges, MD (exp. 2012)

RESIDENT PAPER AWARD COMMITTEE
Robert M. Peroutka, MD - Chair
L. Andrew Koman, MD
Frederick N. Meyer, MD

NOMINATING COMMITTEE
Dabney Y. Hofammann, MD - Chair
Ricardo J. Rodriguez, MD
Douglas M. Cooper, MD
Robert J. Zarzour, MD
R. Scott Sharp, MD

FINANCE COMMITTEE
Robert M. Peroutka, MD - Chair
L. Andrew Koman, MD
Frederick N. Meyer, MD
Ricardo Rodriguez, MD

PUBLICATIONS COMMITTEE
William C. Warner, Jr., MD - Chair
Robert M. Peroutka, MD
Steve Morgan, MD
L. Andrew Koman, MD - Ex-Officio

DR. AND MRS. J. ELMER NIX ETHICS AWARD COMMITTEE
Dabney Y. Hofammann, MD - Chair
Robert J. Zarzour, MD
R. Scott Sharp, MD

CONTINUING MEDICAL EDUCATION COMMITTEE
Frederick N. Meyer, MD - Chair
Bess E Brackett, MD
Steven Morgan, MD
Robert M. Peroutka, MD
(Program Chair 2011)
Angus McBryde, MD
Ricardo Rodriguez, MD

BYLAWS COMMITTEE
J. Donald Opgrande, MD - Chair
Robert M. Peroutka, MD
William C. Warner, Jr., MD

VISITING PROFESSOR COMMITTEE
L. Andrew Koman, MD - Chair
Bess E Brackett, MD
William C. Warner, Jr., MD
# PAST PRESIDENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
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<tbody>
<tr>
<td>John Lincoln Porter*</td>
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<td>Albert H. Freiberg*</td>
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<td>Edwin W. Ryerson*</td>
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<td>Emil Geist*</td>
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<td>John Prentiss Lord*</td>
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<td>H. Winnett Orr*</td>
<td>1920</td>
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<td>Melvin S. Henderson* (November)</td>
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<td>Frederick C. Kidner*</td>
<td>1921</td>
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<td>Arthur Steindler*</td>
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<td>Edward S. Hatch*</td>
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<td>William B. Carroll*</td>
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<td>J.F.M. Thomson*</td>
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<td>James A. Dickson*</td>
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<td>Myron O. Henry (January)</td>
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<td>Herman F. Johnson*</td>
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<td>George J. Garceau*</td>
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<td>Robert E. Burns*</td>
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<td>C. R. Rountree*</td>
<td>1950</td>
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<td>George W. N. Eggers*</td>
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<td>Claude N. Lambert*</td>
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<td>Marcus J. Stewart*</td>
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<td>Atha Thomas*</td>
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<td>Fred C. Reynolds*</td>
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<td>Charles H. Frantz*</td>
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<td>Einer W. Johnson, Jr.*</td>
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<td>F. Robert Brueckmann</td>
<td>1990</td>
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<td>John S. Gould</td>
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<td>Lorence W. Trick</td>
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<td>J. Elmer Nix</td>
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<td>Raoul P. Rodriguez*</td>
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<td>W. Malcolm Granberry</td>
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<td>Joseph C. DeFiore, Jr.</td>
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<td>Stephen K. Bubb</td>
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<td>Robert H. Haralson, III</td>
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<td>J. Donald Ogrande</td>
<td>2003</td>
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<td>G. James Sammarco</td>
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<td>Robert M. Campbell, Jr.</td>
<td>2005</td>
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<td>James J. Hamilton</td>
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<td>Kenneth L. Moore</td>
<td>2007</td>
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<td>Angus M. McBryde, Jr.</td>
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<td>Dabney Y. Hofmann</td>
<td>2009</td>
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<td>Frederick N. Hofmann</td>
<td>2010</td>
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<tr>
<td>L. Andrew Koman, MD</td>
<td>2011</td>
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</table>

* Deceased
PAST MEETINGS

Chicago, IL ........................................ 1912
St. Louis, MO (March) ......................... 1913
Lincoln & Omaha, NE (November) ...... 1913
Detroit, MI ...................................... 1914
Minneapolis, St. Paul & Rochester, MN .... 1915
Cleveland & Cincinnati, OH ............... 1916
Memphis, TN (April) ......................... 1920
Chicago, IL & Milwaukee, WI (November) 1920
Iowa City, IA & Kansas City, MO ......... 1921
Minneapolis, St. Paul & Rochester, MN .... 1922
St. Louis, MO .................................. 1923
Cleveland, Cincinnati & Elyria, OH ...... 1924
Omaha & Lincoln, NE ......................... 1925
Detroit & Ann Arbor, MI .................... 1926
Memphis, TN (January) ...................... 1928
Chicago, IL (November) .................... 1928
Milwaukee & Madison, WI .................. 1929
Columbus & Toledo, OH ..................... 1930
Kansas City, MO & Iowa City, IA ......... 1931
Chicago, IL- with A.A.O.S ................. 1933
Minneapolis, St. Paul & Rochester, MN (November) 1933
St. Louis, MO .................................. 1934
Louisville, KY & Indianapolis, IN ....... 1935
Shreveport, LA & Dallas, TX .............. 1936
Chicago, IL .................................... 1937
Birmingham, AL & Nashville, TN ......... 1938
Little Rock, AK & Oklahoma City, OK .... 1939
Milwaukee & Madison, WI .................. 1940
Cleveland & Akron, OH ..................... 1941
Chicago, IL-with A.A.O.S. (Jan.) .......... 1943
Chicago, IL-with A.A.O.S. (Jan.) ......... 1944
Milwaukee, WI (October) ................. 1944
Cincinnati, OH ................................ 1945
Rochester, MN ................................. 1946
Indianapolis, IN .............................. 1947
Detroit, MI .................................... 1948
St. Louis, MO .................................. 1949
Houston, TX ................................... 1950
Lincoln & Omaha, NE ....................... 1951
New Orleans, LA .............................. 1952
Minneapolis & St. Paul, MN ............... 1953
Chicago, IL .................................... 1954
Oklahoma City, OK ............................ 1955
Cleveland, OH .................................. 1956
Kansas City, MO ............................... 1957
Denver & Colorado Springs, CO ......... 1958
Memphis, TN ................................... 1959
Milwaukee, WI ................................. 1960
Dallas, TX ..................................... 1961
Detroit, MI .................................... 1962
Nashville, TN .................................. 1963
Rochester, MN ................................. 1964
Indianapolis, IN .............................. 1965
Chicago, IL .................................... 1966
Columbus, OH ................................. 1967
New Orleans, LA .............................. 1968
Louisville, KY .................................. 1969
Houston, TX ................................... 1970
St. Louis, MO .................................. 1971
Ann Arbor, MI ................................ 1972
Cleveland, OH ................................. 1973
San Antonio, TX ............................... 1974
Oklahoma City, OK ........................... 1975
Denver, CO .................................... 1976
Cincinnati, OH ................................. 1977
Detroit, MI .................................... 1978
Memphis, TN ................................. 1979
Nashville, TN ................................. 1980
Milwaukee, WI ................................. 1981
Indianapolis, IN ............................... 1982
New Orleans, LA ............................. 1983
Birmingham, AL ............................... 1984
Fort Worth, TX ............................... 1986
Chicago, IL .................................... 1987
Cincinnati, OH ................................. 1988
Minneapolis, MN .............................. 1989
Houston, TX ................................... 1990
St. Louis, MO .................................. 1991
Denver, CO ................................. 1992
Point Clear, AL ............................... 1993
Columbus, OH ................................. 1994
San Antonio, TX .............................. 1995
Gatlinburg, TN ............................... 1996
Kansas City, MO .............................. 1997
New Orleans, LA ............................. 1998
Orlando, FL ................................. 1999
Birmingham, AL .............................. 2000
Seattle, WA ................................. 2001
Indianapolis, IN .............................. 2002
Tucson, AZ .................................. 2003
Isle of Palms, SC ............................ 2004
San Antonio, TX ............................. 2005
Minneapolis, MN ............................. 2006
Memphis, TN ................................. 2007
Annapolis, MD ............................... 2008
Point Clear, AL ............................... 2009
Denver, CO .................................... 2010
Charleston, SC .............................. 2011
2012 HONOREE

Charles A. Rockwood, Jr., MD
Professor
UT Health Science Center at San Antonio
San Antonio, TX

Lectures:
Ethics, Professionalism, Orthopaedics and Industry

What is the Best Treatment for Fractures of the Proximal Humerus in the Elderly Patient?

Past Recipients

2002.................Dr. Augustus White
2003.................Dr. Edward Henderson
2004.................Dr. Leonard Goldner
2005..................Dr. Dean McEwen
2006..................Dr. Paul DeRosa
2007..................Dr. Terry Canale
2008............Dr. Augusto Sarmiento
2009.............Dr. Bernard Morrey
2010............Dr. Lewis G. Zirkle
2011............Dr. Chitranjan S. Ranawat
MISSION STATEMENT

Founded in 1912, the mission of the Clinical Orthopaedic Society is to optimize the science of the physical examination as the central component in the diagnosis and management of musculoskeletal conditions and to educate society on orthopaedic issues impacting patient care.

VISION

The Clinical Orthopaedic Society, Inc., will be the organization of choice for the experienced, clinical orthopaedist.

VALUES

- Education
- Fellowship
- Constructive Criticism
- Professionalism
- Honesty
- Integrity
- Ethics
- Community
Dear Colleagues,

Welcome to the 100th Annual Meeting of the Clinical Orthopaedic Society. It is a great achievement to reach the ripe old age of 100 and I am honored that you have chosen to celebrate this occasion in Chicago with us.

Pietro Tonino, MD, assisted by William Hopkinson, MD of Loyola, have put together a wonderful scientific program that is broad-ranging. We have been able to draw upon the vast depth of orthopaedic expertise in the Chicago area. There are five residency programs in the Chicago area and we are fortunate enough to have faculty from almost all of the programs.

The Presidential speakers include Richard Rothman, MD, of Philadelphia and Thomas Schmalzried, MD, of Los Angeles.

Dr. Rothman is well known for his seminal book on The Spine, but more importantly for his work in joint Arthroplasty as well the business of medicine. The Rothman Institute is one of a kind and is the result of forty years of planning, work and vision.

Dr. Schmalzried is well known for his work in joint Arthroplasty, and has been honored with four Hip Society awards. One of his current interests is to quantify patient activity after total joint replacement. He is an excellent teacher and speaker and is highly respected.

Charles Rockwood, MD, of San Antonio is the J. Elmer Nix Ethics Lecturer. He has had a lasting influence on many orthopaedic surgeons and is one of the icons of shoulder surgery. Dr. Rockwood’s name is also synonymous with the Rockwood and Green longstanding textbook of fracture care. He is quite outspoken and a passionate speaker.

Be sure to attend the Friday 100th Anniversary Gala, which promises to be a night to remember. Thursday night is our Dine Around, which is another great opportunity to catch up with friends. Be sure to take time to enjoy Chicago and banish any untoward memories of the oral boards at the Palmer House.

On behalf of the Clinical Orthopaedic Society Board of Directors, thank you for supporting the COS and ensuring that this society continues to grow and thrive throughout the next 100 years.

Sincerely,

Bess E Brackett, MD

COS President
In December, 1912, the Central Orthopaedic Club held its organizational meeting. At that time, there were 137,199 doctors in the United States, one-fourth as many as in 1986. The estimated total population was 91,972,266. The American Orthopaedic Association had recently concluded its 25th Annual meeting in Atlantic City with a roster of 85 active, 4 honorary, 3 emeritus, and 19 corresponding members. William Howard Taft was concluding his presidency and Woodrow Wilson was soon to take his place. The Panama Canal was preparing for the passage of its first ship.

The inspirational force of this Society was John Lincoln Porter of Chicago. The reason was a quest for expanded knowledge of a first-hand clinical footing. Even though the founding members were also members of the AOA, there was no dissension — only a desire to broaden their scope of learning by seeing, hearing and criticizing — methods incorporated in our present logo designed by Dr. J. E. M. Thompson.

The first meeting of the Club took place in Chicago, December 18 and 19, 1912. The attendees rode street cars to Mercy Hospital and St. Lukes Hospital and the elevated train to Children’s Memorial Hospital. In the evening, they met with the Chicago Medical Society for dinner which cost $2.50. A fleet of twelve automobiles was available for transportation that evening.

Patients were seen at that meeting and the subjects included arthroplasties of the hip and knee, congenital dislocation of the hip, compound fractures, experimental arthritis, scoliosis, State Care of the Crippled and Deformed, Osteitis Fibrosa and the treatment of paralytic foot deformities. We still concern ourselves with these same problems. Several of these talks in the evening were illustrated as noted in the program by stereopticon.

The original roster of the Club published in 1913 included 35 members. By 1920, it reached 73.

Because any one city may not have been able to host a two-day meeting, sessions were often scheduled in adjacent cities – such as Lincoln and Omaha, Iowa City and Kansas City, Detroit and Ann Arbor, and Milwaukee and Madison. After 1920, there were annual rather than twice-yearly meetings. In 1921, the name was changed to the Clinical Orthopaedic Society, emphasizing the patient care aspect.

The early membership of the organization drew heavily from the AOA. Members of this Society who also at one time or another were officers of the AOA included John Ridlon, Arthur J. Gillette, Herbert P. Galloway, A. H. Freiberg, John L. Porter, Walter G. Stern, Nathaniel Allison,
Edwin W. Ryerson, F. J. Gaenslen, and H. Winnett Orr.

The dues in 1920 were set at $3.00 per year, raised to $5.00 in 1949 and $15 in 1960. They have been $75 since 1981.

In 1931, there was great discussion concerning the formation of a national orthopaedic society carried out in the privacy of sidetracked Pullman cars used at the Kansas City – Iowa City meeting. Almost at the same time, in Chicago, a group from the AOA discussed the same subject. The result was the establishment of the AAOS, the original founders – Frederick Gaenslen, Willis Campbell, Edwin Ryerson, J. Winnett Orr, Phillip Lewin, Melvin Henderson, and E. Bishop Mumford being staunch members of both organizations. The first meeting of the AAOS was held in Chicago in conjunction with the 20th Meeting of the Clinical Orthopaedic Society, January 12-14, 1933.

All of this is fascinating indeed. Review of these activities helps us to put into proper perspective our own concerns and activities. Their purpose was the improvement of the care of orthopaedic patients. Their meetings – as are ours – were in a sense ‘outcome’ studies – a term carrying much significance in our present day and our current quest for quality care. What better way is there to study outcome than to examine and speak with the patient? All of our meetings are outcome studies and our journals and libraries are full of them. We base our treatment on facts from these studies. Yet we are told by ‘health care experts’ that we need proper outcome studies to evaluate quality of care.
COURSE OBJECTIVES

Spine
Update on the most recent techniques in pediatric spine. Understand the most common treatments for spine trauma and spine conditions.

Pediatrics
Learn the most up-to-date trends in the evaluation and treatment of SCFE and pediatric joint infections. How to avoid complications with pediatric forearm fractures.

Tumor
Learn how to manage periacetabular metastatic disease and understand guidelines for reconstruction after resection of pelvic tumors. Understand different types of adjuvant treatment of intralesional surgery of bone tumors.

Trauma
Learn the most recent treatment of common hip fractures and proximal humeral fractures. Understand how to optimize treatment of fractures in the elderly and when to operate on fractures of the distal radius.

Arthroplasty
Understand how to deal with complex arthroplasty conditions of the knee and prosthetic joint infections and postoperative instability. Learn about alternate bearings in total hip arthroplasty.

Sports and Arthroscopy
Understand how to treat pediatric ACL injuries, and learn current arthroscopic treatment of common hip conditions and meniscal injuries. Learn how to evaluate and treat common throwing injuries and patellofemoral instability. Learn how to teach arthroscopy in underserved areas.

Foot and Ankle
Learn how to deal with complex foot conditions such as Charcot foot and malunited calcaneal fractures. Understand how to evaluate and treat ankle arthritis and posterior tibial dysfunction and chronic instability associated with rotational ankle fractures.

Hand and Wrist
Learn how to evaluate and treat hand and wrist conditions that require tendon transfers and how to complete wrist reconstructions. Understand concepts of treatment of ulnar abutment syndrome.

ACCREDITATION & DESIGNATION

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American Academy of Orthopaedic Surgeons and Clinical Orthopaedic Society. 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 15 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.
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September 13 - 15, 2012 • Chicago, IL
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Oak Park, IL

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Children's Memorial Hospital
Chicago, IL

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Chicago, IL  

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Children's Orthopaedics and Scoliosis Surgery Associates, LLP  
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Stryker ...............................................................3
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Julie Hitt ..................................................... 1
THURSDAY, SEPTEMBER 13, 2012

6:30 am - 1:45 pm  Registration

6:30 am - 7:00 am  Breakfast with Exhibitors

7:00 am - 7:05 am  Welcome and Opening Remarks - Bess E Brackett, MD

7:05 am - 7:20 am  The Lantern Slides of Dr. Edwin W. Ryerson
                    - Ronald A. Hoekman, MD

7:20 am - 7:35 am  History of the Clinical Orthopaedic Society
                    - E. Boone Brackett III, MD

SPINE SESSION – Moderator: William C. Warner, Jr., MD

7:35 am - 7:50 am  Current Concepts in Evaluation and Management of Pediatric Spinal Deformity - Steven Mardjetko, MD

7:50 am - 8:05 am  The Professional Athlete’s Spine Initiative (PASI): Outcomes after Lumbar Disc Herination in 349 Elite Professional Athletes - Wellington K. Hsu, MD

8:05 am - 8:20 am  Masquerading Conditions and the Spine - Alexander J. Ghanayem, MD

8:20 am - 8:30 am  Discussion / Q & A

PEDIATRIC SESSION – Moderator: William C. Warner, Jr., MD

8:30 am - 8:45 am  SCFE: Current Trends in Treatment - Joseph A. Janicki, MD

8:45 am - 9:00 am  An Update on the Diagnosis of Pediatric Septic Joints - Teresa Cappello, MD

9:00 am - 9:15 am  Pediatric Radius and Ulna Shaft Fractures: Staying out of Trouble - Christine B. Caltoum, MD

9:15 am - 9:25 am  Discussion / Q & A

9:25 am - 10:05 am  Break with Exhibitors

TUMOR SESSION – Moderator: Rex C. Haydon, MD, PhD

10:05 am - 10:20 am  Management of Peri-acetabular Metastatic Disease - Samer Attar, MD

10:20 am - 10:35 am  Guidelines for Reconstruction After Pelvic Resections - Rex C. Haydon, MD, PhD

10:35 am - 10:50 am  Computer-Navigated Surgery in Orthopaedic Oncology - Hue H. Luu, MD

10:50 am - 11:05 am  Adjuvant Treatment After Intrallesional Surgery for Bone Tumors - Robert Steffner, MD

11:05 am - 11:20 am  Discussion / Q&A
100TH ANNIVERSARY MEETING PROGRAM

11:20 am - 11:35 am  Presidential Guest Speaker - Dr. Thomas P. Schmalzried
Patient Activity Levels After Arthroplasty

11:35 am - 12:05 pm  Live Patient Presentation

12:05 pm - 12:20 pm  Presidential Guest Speaker - Dr. Thomas P. Schmalzried
The Importance of Proper Acetabular Component Position and the Challenges to Achieving It

12:20 pm - 1:20 pm  Lunch with Exhibitors

TRAUMA SESSION  –  Moderator: L. Andrew Koman, MD

1:20 pm - 1:35 pm  Trends in Treatment of Hip Fractures - Michael Stover, MD

1:35 pm - 1:50 pm  Current Techniques for Proximal Humerus Fractures
- Hobie Summers, MD

1:50 pm - 2:05 pm  Optimizing Fracture Treatment in the Elderly
- Erika J. Mitchell, MD

2:05 pm - 2:20 pm  Distal Radius Fractures: When to operate, what to use?
- L. Andrew Koman, MD

2:20 pm - 2:30 pm  Discussion / Q & A

2:30 pm  Meeting Adjourns

2:30 pm  Dine-Around

FRIDAY, SEPTEMBER 14, 2012

7:00 am - 1:15 pm  Registration

7:00 am - 8:00 am  Breakfast with Exhibitors

8:00 am - 8:15 am  The Electronic Medical Record: From a Patient and Physician Perspective - E. Boone Brackett III, MD

8:15 am - 9:00 am  Papers with Discussion
- Moderator: L. Andrew Koman, MD

9:00 am - 9:15 am  Treatment for Fractures of the Proximal Humerus in the Elderly - Charles A. Rockwood, Jr., MD

HIP AND KNEE ARTHROPLASTY SESSION  –  Moderator: William Hopkinson, MD

9:15 am - 9:30 am  The Difficult Knee Arthroplasty - David Manning, MD

9:30 am - 9:45 am  Prosthetic Joint Infections - Harold W. Rees, MD

9:45 am - 10:00 am  Alternate Bearings in Total Hip Arthroplasty
- James C. Kudrna, MD, PhD

10:00 am - 10:15 am  Instability Following Total Hip Arthroplasty - Karen Wu, MD

10:15 am - 10:25 am  Discussion / Q & A
100TH ANNIVERSARY MEETING PROGRAM

10:25 am - 10:45 am Break with Exhibitors
10:45 am - 11:00 am Presidential Guest Speaker - Richard H. Rothman, MD, PhD
Creating A Center of Excellence
11:00 am - 11:30 am Business Meeting
11:30 am - 12:00 pm Nix Award Presentation - Charles A. Rockwood, Jr., MD
Ethics, Professionalism, Orthopaedics and Industry
12:00 pm - 1:00 pm Lunch
12:00 pm - 1:00 pm Non-CME Sponsored Session
Cymbalta® (duloxetine HCl): A Non-NSAID, Non-Narcotic, Once Daily Analgesic Option for the Management of Chronic Musculoskeletal Pain Due to Chronic Osteoarthritis Pain or Chronic Low Back Pain — With Focus on Chronic Osteoarthritis Pain. Cymbalta is a registered trademark of Eli Lilly and Company.
1:00 pm - 1:30 pm Live Patient Presentation
SPORTS MEDICINE & ARTHROSCOPY SESSION – Moderator: Sherwin Ho, MD
1:30 pm - 1:45 pm Thoughts on Effective Teaching Basic Arthroscopy Skills
- Howard J. Sweeney, MD
1:45 pm - 2:00 pm Current Status of Rotator Cuff Repairs
- Gordon W. Nuber, MD
2:00 pm - 2:15 pm Pediatric Anterior Cruciate Ligament Injuries
- Drew E. Warnick, MD
2:15 pm - 2:30 pm Update on Hip Arthroscopy - Sherwin Ho, MD
2:30 pm - 2:45 pm Current Concepts in Meniscus Injuries
- Mark R. Hutchinson, MD
2:45 pm - 3:00 pm Current Concepts in Throwing Injuries
- Charles A. Bush-Joseph, MD
3:00 pm - 3:15 pm Patellofemoral Instability: State of the Art - Jason L. Koh, MD
3:15 pm - 3:25 pm Discussion / Q & A
3:25 pm Meeting Adjourns
100th Anniversary Gala Celebration
6:30 pm • Cocktails
7:00 pm • Dinner
100TH ANNIVERSARY MEETING PROGRAM

SATURDAY, SEPTEMBER 15, 2012

6:30 am - 10:30 am  Registration
6:30 am - 7:30 am  Continental Breakfast
7:30 am - 8:30 am  Papers with Discussion
  Moderator: Frederick N. Meyer, MD

FOOT AND ANKLE SESSION – Moderator: Michael S. Pinzur, MD
8:30 am - 8:45 am  Circular Fixation in Non-Plantigrade Charcot Foot Deformity - Michael S. Pinzur, MD
8:45 am - 9:00 am  Malunion of Calcaneus Fractures: A treatable condition - Steve L. Haddad, MD
9:00 am - 9:15 am  Comparisons of Total Ankle Arthroplasty and Arthroscopically Assisted Ankle Arthodesis for End Stage Arthritis - Armen S. Kelikian, MD
9:15 am - 9:30 am  The Adult Acquired Flat Foot: What to do? - Richard M. Marks, MD, FACS
9:30 am - 9:45 am  Chronic Instability of Syndesmosis after Rotational Ankle Fracture - Brian C. Toolan, MD
9:45 am - 10:00 am  Discussion / Q&A
10:00 am - 10:30 am  Live Patient Presentation
10:30 am - 10:45 am  Coffee Break
10:45 am - 11:00 am  Presidential Guest Speaker - Richard H. Rothman, MD, PhD
  Evidence-Based Medicine – Is purity a virtue?

HAND AND WRIST SESSION – Moderator: Terry R. Light, MD
11:00 am - 11:15 am  Advances in Tendon Transfer Surgery - Michael S. Bednar, MD
11:15 am - 11:30 am  Ulnar Abutment Syndrome - Daniel J. Nagle, MD
11:30 am - 11:45 am  Innovations in Wrist Ligament Repair and Reconstruction - Mark S. Cohen, MD
11:45 am - 12:00 pm  Discussion / Q&A
12:00 pm - 12:30 pm  Presidential Address / Passing of the Presidential Gavel
  Bess E Brackett, MD / William C. Warner, Jr., MD
12:30 pm  Meeting Adjourns
The Lantern Slides of Dr. Edwin W. Ryerson

Ronald Hoekman, MD

Objective:
This presentation will use a recently uncovered collection of lantern slide images to open an historical window into the challenges of orthopedic surgery as it existed in the 1st half of the 20th century. I will briefly review the biography of Dr. Ryerson and his Grand Rapids contemporary, Dr. John T Hodgen, known as the father of orthopaedic surgery in Grand Rapids. We can speculate on how this collection came to end up in a hospital basement in Grand Rapids, Michigan. I will show how this period of history fits in the timeline of surgery in general, and the specialty of orthopedic surgery, as well as the history of x-ray, photography, and of the lantern slide. Selected images from these slides will highlight the problems facing orthopedic surgeons in that era and allow us to reflect on the spectacular changes in our specialty that have taken place in the last 100 years.

Methods:
When Blodgett Hospital (now Spectrum/Blodgett) decided to clean out a basement storeroom in a section of the hospital dating back to 1915, they contacted Dr. Genevieve Swanson about the fate of the room's contents, now destined for the dumpster. She, in turn, enlisted the help of a mutual friend and colleague, Dr. John Colwill, I was subsequently recruited into the task of determining the fate of this long-buried and forgotten treasure. The heart of the room's contents consisted of a collection of about 2000 lantern slides with images of orthopaedic interest; mostly x-rays, some photographs, a few slides with text or diagrams, all obviously meant for presentations. The lantern slides are sandwiches of thin glass plates roughly 3" x 4" with a photographic image on one of the glass plates protected by the matching clear glass of its mate. A thin paper mask sandwiched between the two plates is cut to appropriately crop the image. Many of the slides are labeled with the name of E. W. Ryerson M.D., an icon in the field of Orthopaedic Surgery. Many of the images are in excellent condition. Some of the slides have dates, some, the name of the patient, very few, a bit of clinical information. Many are labeled "Edwin W. Ryerson M.D. or just Dr. Ryerson.

Dr. Ryerson is an icon in the field of orthopaedic surgery. He lived and practiced in Chicago. Elected to membership in the AOA in 1905, he became its president in 1925. He was a founding member of the Chicago Orthopaedic Society, the American Board of Orthopaedic surgery, and was a founding member of the Clinical Orthopaedic society begun 100 years ago. When a small group from the Clinical Orthopaedic society formed the American Academy of Orthopaedic Surgeons in 1933, Ryerson became its first President.

Conclusions:
The dates available on the slides range from the 1920s to 1952, although most are from the 1930s. The slides illustrate many cases representing difficult challenges and innovative solutions of that earlier era, solutions, considered at the time, to be the most advanced, but many of which have long since been abandoned or superseded.

Single bone and multifocal osteomyelitis, Spinal tuberculosis (Pott's disease), fractures fixed before and after the development of metallic hardware, scoliosis, clubfoot, advanced
osteoarthritis of the hip and knee, and osteonecrosis are some of the problems represented.
Although better answers for most of these problems have been developed over the years,
it is informative to reflect on the struggles for solutions in an era before the abundance
of our present-day resources. A review of some of the major milestones in the history of
orthopaedic surgery helps to approximate the time frame of some of the undated slides
offering a glimpse into the state of our specialty in that period of time, the first half of the
20th century.

Finally, as we construct our presentations on a computer, we can reflect on an earlier time
and the difficulties of creating a presentation with Kodachrome slides, or its predecessor, the
lantern slide.
History of the Clinical Orthopaedic Society

E. Boone Brackett III, MD
Westgate Orthopaedics, Inc.

One hundred years ago in Chicago, indeed, in this very hotel, Dr. John Lincoln Porter and a select group of orthopedic surgeons, all members of the American Orthopaedic Association, organized an Orthopaedic society named the Central States Orthopaedic Club.

These founders were no rebels, for they knew and appreciated the lofty position the A.O.A., then celebrating the silver anniversary of its founding, occupied (and still does). But, at approximately 85 members, the A.O.A. was thought to be too large. The founders wanted a smaller group, in which one could freely discuss and argue various orthopedic topics. Three principles were paramount. Comments from the floor were welcomed and patients were presented in person so that interested members of the audience could inquire and actually examine them.

This “hands-on” clinical “show me” attitude prevailed, and the society, the world’s second oldest orthopedic society, has prevailed for a century.

For most of its history, the society was an ‘invitation only’ group, but now applications from all orthopedic surgeons are welcome. The Clinical Orthopaedic Society has a fascinating history, and I look forward to discussing it with you.
Current Concepts in Evaluation and Management of Pediatric Spinal Deformity

Steven Mardjetko, MD
Illinois Bone and Joint Institute


METHODS: Structured Presentation of Pediatric Spinal Deformity covering:

1. Early Onset Spinal Deformity
2. Congenital Neuromuscular, syndetic Ethnologies
3. Non-Op Treatment with Orthotics
4. Surgical Treatment

RESULTS: Completion of Outcome from Literature and Clinic Experience
The Professional Athlete’s Spine Initiative (PASI): Outcomes after Lumbar Disc Herniation in 349 Elite Professional Athletes

Wellington K. Hsu, MD
Northwestern University
Chicago, IL

Introduction
Clinical outcomes after lumbar disc herniations (LDH) in elite professional athletes have not been well-studied.

Methods
A total of 349 professional athletes from professional American football, hockey, basketball, and baseball diagnosed with a LDH were identified via a previously published protocol. Return-to-play, career games, and years played for each player cohort were compared in each cohort utilizing linear and mixed regression analysis models.

Results
After the diagnosis of a LDH, professional athletes successfully returned to sport 82% of the time with an average career length of 3.4 years (Figure 1). There were no statistically significant differences in outcome in the surgical and nonoperative cohorts. Games played before injury had a positive effect on career length after injury. Age at diagnosis was a negative predictor of career length after injury. Major League Baseball (MLB) players demonstrated higher return-to-play rates and longer careers after diagnosis than those of other sports (p<0.05). National Football League (NFL) athletes had a significantly lower return-to-play rate than players of other sports (p<0.05). However, the greatest positive treatment effect from surgery for LDH was seen in NFL players while for MLB athletes, a lumbar discectomy led to fewer games played after surgery (p<0.05).

Conclusions
Professional athletes diagnosed with a LDH successfully returned to play at a high rate with productive careers after injury. Notably, although baseball players have a better prognosis than other sports, surgery was associated with fewer games played compared to nonoperative treatment. Outcomes after a lumbar discectomy in the elite athlete population likely depends on a number of factors including sport played.
Masquerading Conditions and the Spine

Alexander J. Ghanayem, MD
Loyola University Medical Center
Maywood, IL

PURPOSE:
To illustrate how a number of other non-spine conditions can masquerade as a spine problem and vice versa.

RESULTS:
Multiple musculoskeletal and non-musculoskeletal conditions can manifest, at least on the surface, as a spine-related problem or condition. For example, cervical disorders frequently can be mistaken for shoulder pathologic processes and vice versa. Problems related to hip joint weakness, pain or limp, can emanate from the hip itself or could be a manifestation of a mid lumbar radiculopathy. Other non-musculoskeletal conditions can present with low back pain (i.e. aortic aneurysm). This talk will review how these conditions present and can simulate and or be differentiated from a spine condition.
SCFE: Current Trends in Treatment

Joseph A. Janicki, MD
Lurie Children’s Hospital, Northwestern University Department of Orthopaedics
Chicago, IL

1. Etiology
2. Classification
   a. acute, chronic, acute on chronic
   b. stable, unstable
   c. radiographic severity
3. Diagnosis
   a. Clinical Examination
   b. Radiographic Findings
4. Initial Treatment
   a. pin fixation
   b. open reduction
4. Unstable SCFE
   a. timing
   b. reduction?
      c. hematoma decompression
      d. fixation
5. Complications
6. Prophylactic Fixation
7. Osteotomy
   a. femoral neck
   b. intertrochanteric
      c. subtrochanteric
An Update on the Diagnosis of Pediatric Septic Joints

Teresa Cappello, MD
Loyola University Chicago

PURPOSE:
The purpose of this lecture is to update the orthopaedic clinician on the history, examination and work-up of pediatric septic joints

METHODS:
The combined utility of history of fever, weight bearing status, white blood cell count and inflammatory marker levels will be reviewed and how they assist the orthopaedic surgeon in determining the likelihood of a pediatric bacterial joint infection.

(Note: this lecture is not a presentation of original scientific data but a review of published literature and practice guidelines. Therefore the “RESULTS” section is not pertinent. Please contact me if further information is required. Thank you.)
Pediatric Radius and Ulna Shaft Fractures: Staying out of Trouble

Christine B. Caltoum, MD
Indiana University School of Medicine

PURPOSE:
Discuss staying out of trouble with pediatric forearm fractures.

METHODS:
Emphasis on method of injury, epidemiology of forearm fractures, clinical and radiographic assessment. Will discuss treatment of forearm fractures as it relates to the pediatric population with a special focus on Monteggia fractures and Galeazzi fractures.

RESULTS:
Will present a case based series of patients to illustrate forearm fractures in kids: the dos and don’ts.
Osseous disease secondary to myeloma and metastatic carcinoma frequently involves the pelvis. The overall management is multidisciplinary and requires a team approach with surgical, medical, and radiation oncologic specialists. A thorough history and examination in addition to appropriate staging studies will demonstrate the extent of visceral and osseous disease as well as surgical candidacy. In spite of modifications over the years, the principles and designs of surgical constructs have not changed substantially over the past decade. This paper reviews the current concepts and trends in the evaluation and management of periacetabular metastatic disease.
Guidelines for Reconstruction After Pelvic Resections

Rex C. Haydon, MD, PhD
The University of Chicago
Purpose:
The objective of this presentation is to: (1) review the current state of computer-navigated surgery in musculoskeletal oncology and (2) investigate the role and effectiveness of computer-navigated surgery for benign and malignant bone tumors.

Methods:
We reviewed our experience with computer-navigated surgery and those in the literature for the treatment of benign and malignant bone tumors of the pelvis and extremities. While our experience has been with CT-based navigated surgeries, we included both MRI- and CT-based navigated surgeries in our review.

Results:
Computer-navigated surgery is safe and effective in the treatment of bone tumors of the pelvis and extremities. There is a limited number of patients for whom this surgery is appropriate, and these patients need to be carefully selected. The anatomy of the tumor dictates whether computer-navigated surgery is appropriate. This technology allows the surgeon to be close to the tumor margin while not sacrificing our oncology goals, and maximizing our reconstructive and functional goals.
Adjuvant Treatment after Intralesional Surgery for Bone Tumors

Robert Steffner, MD
University of Chicago Medical Center

PURPOSE:
To discuss current adjuvant treatments and assess their mechanism and effectiveness.

METHODS:
Review current literature with emphasis on intracystic injections, sclerotherapy, intralesional modalities, and external treatments.

RESULTS:
Adjuvants each have benefits and risks. This need to be weighed against the tumor characteristics to determine which measure is most appropriate. Guidelines and recommended indications for use will be reviewed.
Patient Activity After Joint Replacement

Thomas P. Schmalzried, MD
Joint Replacement Institute, St. Vincent Medical Center, L.A.
Harbor-UCLA Medical Center, Torrance, CA

PURPOSE:
Quantify ambulatory activity of patients with well-functioning total hip and/or total knee replacements.

METHODS:
We have measured the ambulatory activity of 276 patients. A microprocessor with a two-dimensional accelerometer (StepWatch Activity Monitor or SAM; Cyma Corp.; Seattle, WA) is worn on the ankle. The SAM records the motion of the leg in real time, continuously, for up to 2 weeks.

RESULTS:
We have observed a 45-fold variability in the ambulatory activity of joint replacement patients. In general, age is negatively correlated to activity, but many patients age 65 and older are very active. Average ambulation is about 2 million gait cycles per year. The number of gait cycles and gait speed both influence polyethylene wear. Wear is a function of use, not time. As patients age, gait speed decreases first and then the amount of ambulation declines. These observations have implications for the wear and longevity of current-generation prostheses and for post-op. activity recommendations.
The Importance of Proper Acetabular Component Position and the Challenges to Achieving It

Thomas P. Schmalzried, MD
Joint Replacement Institute, St. Vincent Medical Center, L.A.
Harbor-UCLA Medical Center, Torrance, CA

PURPOSE:
Improve the outcomes of hip arthroplasty by improving acetabular component positioning.

METHODS:
Literature review. Radiographic analyses of hip biomechanics. Analyses of acetabular component position with comparison of anteversion as measured on an AP projection by EBRA and a true lateral projection. Analyses of retrieved components and tissues.

RESULTS:
Acetabular component position influences ROM and stability, bearing and non-bearing wear. Hips with lateral opening angles >50 degrees and/or combined anteversion (acetabular plus femoral) >40 degrees have a higher risk of edge loading and an adverse local tissue reaction (ALTR) with metal-metal bearings. Femoral version influences the ideal acetabular component version. A true lateral radiograph is a practical surrogate for acetabular component anteversion. There are two parts to the position challenge: 1) determining the target for this patient and 2) hitting that target.
Trends in Treatment of Hip Fractures

Michael Stover, MD
Loyola University Medical Center
Current Techniques for Proximal Humerus Fractures

Hobie Summers, MD
Loyola University Medical Center

- Imaging
- Injury determination and when CT is indicated
- Positioning and Surgical approaches
- Reduction strategy and tips for success
- Keys to appropriate fixation
- Post-operative protocol

In this presentation, we will discuss surgical techniques for difficult proximal humerus fractures. We will describe the indications for CT and how to interpret plain radiography. Positioning and choice of surgical approach will also be discussed.

The majority of the discussion will be concerned with reduction strategies and tips for successfully fixing these difficult fractures. Lastly, we will briefly discuss post-operative protocols for therapy and length of lifting restrictions.
Fracture care in the geriatric population is changing. Not only is the elderly population growing, it is more active and more independent than previous generations. It is no longer acceptable to assume a patient will live the remainder of their years in a nursing home after a hip fracture. Rather, these patients hope to return to independent living, athletic activities and unassisted mobility.

Appropriate peri-operative treatment of geriatric fracture patients can significantly improve their outcomes, decrease hospital stays and decrease medical costs. A team approach with hospitalists, physical therapists, nurses and surgeons leads to timely surgical care, reduced spending on diagnostic tests and early mobilization. The rate of postoperative delirium can be improved with careful dosing of narcotics and avoidance of medications commonly used in a younger population.

In addition, improved technology in the form of electronic ordering and orthopedic implants designed for osteoporotic bone contributes to better outcomes. Ordering protocols can be designed with medication doses adjusted for slower clearance of narcotics and decreased renal function in elderly patients to prevent confusion, altered mental status and renal failure. Locking implants and titanium plates specifically designed to improve fixation in osteoporotic bone allow for stronger fixation constructs to more rapidly mobilize patients and decrease failure rates.

This presentation will summarize methods of improving the care of geriatric patients with orthopedic injuries from admission to recovery. Our goal is to improve outcomes in this complex patient population and also decrease the financial impact of their medical care.
Distal Radius Fractures: When to Operate, What to use?

L. Andrew Koman, MD
Wake Forest University
Winston-Salem, North Carolina

PURPOSE:
To outline the current indications for closed versus operative treatment of distal radius fractures.

METHODS:
Review of basic biomechanical principals of management of the distal radius and a critical meta-analysis of alternative management options including complications.

RESULTS:
Optimal outcomes in distal radius fractures require reduction, stabilization and neutralization. Depending upon the personality of the fracture, excellent outcomes may be achieved by closed reduction and casting, closed reduction and pins/external fixation, or open reduction and internal fixation (palmar, dorsal and intramedullary).
This presentation will give a minority report on electronic medical records.
PurPOSE:
To evaluate the best treatment for fractures of the proximal Humerus in senior citizens.

METHODS:
A review of the literature and a review of my own practice was undertaken to compare various operative procedures to a non-operative treatment.

RESULTS:
The non-operative treatment had fewer complications and better results than any of the operative procedures.
The Difficult Knee Arthroplasty

David Manning, MD
Associate Professor of Orthopaedics
Northwestern University

PURPOSE:
Present current concepts, strategies and outcomes in the management of difficult primary knee arthroplasty.

METHODS:
Discuss the foundational concepts in managing difficult knee arthroplasty scenarios. Highlights to include: the management of severe deformity, soft tissue deficits, boney defects, limited motion and extensor mechanism compromise. Review these concepts and present individual case vignettes to highlight the salient features of each. Discuss guidelines for implant selection and utilization of modern technologies such as patient specific instrumentation.

OUTCOMES:
Attendees should improve their appreciation of the pitfalls and hurdles in managing the difficult knee arthroplasty patient and acquire additional skills to optimize outcomes.
Prosthetic Joint Infections

Harold W. Rees, MD
Loyola University Department of Orthopaedic Surgery and Rehabilitation

PURPOSE:
Present an overview of the treatment of prosthetic total joint infections.

SUMMARY:
Diagnosis of prosthetic joint infection differs from diagnosis of native joint infection. Symptoms are usually more subtle, often presenting as pain, usually constant and at night, and subtle warmth about the joint. Some patients may develop redness and purulent drainage. Plain radiographs are often normal, but loosening of the prosthetic components often occurs. Laboratory studies, including a sed rate and CRP, can be useful as a screening test to help exclude infection, but if elevated should lead to aspiration of the joint for cell count, crystals and culture. Culture can be negative in 25% of patients with clear signs of infection, so cell counts and differential are important to help make the diagnosis. Other signs such as a draining sinus tract, purulence seen at surgery, and frozen section results are correlated with infection, and can make the diagnosis when other data does not help. Definitive treatment of infection depends on the time course of the event. For patients who have had short-term symptoms or recently had surgery, incision and drainage with change of the modular insert can control infection. This procedure is also useful in patients who cannot tolerate a large operation, with or without chronic antibiotic suppression. Definitive treatment in late or more chronic infection involves removal of the prosthetic components, through debridement, and placement of an antibiotic-laden cement spacer in conjunction with at least 6 weeks of intravenous antibiotic therapy to eradicate infection. In some cases, multiple debridements may be needed. Following eradication, the patient is returned to surgery for re-implantation of a new prosthetic joint. Successful eradication of infection has been reported to be as high as 90% using this protocol. While single-stage debridement and revision has been described, the multiple-stage procedure is still most commonly performed in this country to treat infection.
Alternate Bearings in Total Hip Arthroplasty

James C. Kudrna MD, PhD
Associate Clinical Professor, Department of Orthopaedic Surgery
Pritzker School of Medicine, University of Chicago
Chicago, Illinois

Purpose:
The purpose of this presentation is to discuss the current state of available bearing couples for total hip arthroplasty.

Methods:
A case based presentation will be utilized to introduce current issues with contemporary hip bearings and then present an assessment of bearing choices available to the arthroplasty surgeon in 2012.

Results:
Metal on polyethylene hip bearings have been the mainstay of bearing surfaces since the introduction of hip arthroplasty over four decades ago. Polyethylene wear and the biologic activity of the debris, which resulted in osteolysis, was the major reason to investigate and develop new bearing couples for total hip arthroplasty. Over the past decade several new bearings were introduced to potentially combat the issue of bearing wear. The new bearings included ceramic-ceramic, metal-metal, and highly cross-linked polyethylene. In vitro testing of all of these bearing surfaces were very promising, however, in vivo results have proven otherwise in some cases. Having decade old clinical data on several of these bearings, it is now possible to make a critical assessment of their future potential.

Highly cross-linked polyethylenes have performed well clinically and support the initial low wear rates seen in laboratory studies. Some issues with mechanical properties, seen with initial designs, have been addressed to improve the clinical results. The absence of osteolysis has been very encouraging. Ceramic-ceramic performance has improved with lower fracture rates with newer materials. Squeaking has been an issue and appears to be related to poor lubrication, metal transfer, and specific stem design. Osteolysis has been noted, but extremely rare and limited in the size of lesions.

Resurgence of metal-metal bearing usage to address the issue of stability with large head sizes was initially very promising. Problems with monoblock sub-hemispherical shells, excessive wear, elevated metal ion levels and altered local tissue reactions (ALTR) have resulted in a dramatic decrease in the use of these bearings. Clinical retrievals from early revision of metal-metal bearings has revealed new insights into the effect of large femoral heads on smaller and shorter femoral tapers.

With the current clinical data available for these alternate bearings, it is now time to review and reassess their benefits and potential risks.
Instability following total hip arthroplasty is a major patient dis-satisfier and remains a challenge for the surgeon. Prevention through meticulous surgical technique at the time of primary surgery is the most effective way to deal with this problem. Proper component placement and restoration of proper hip biomechanics including leg length, offset and soft tissue tension are essential. The presenter’s surgical technique and method of assessment of intra-operative joint stability will be the main focus of the presentation. When faced with recurrent dislocation, a thorough preoperative understanding of the etiology of dislocation is key to successful revision surgery. Then presenter’s technique of intra-operative assessment of the instability pattern before and after revision of the components will also be reviewed. Different surgical approaches and newer implant technologies available to reduce dislocation risk will be touched upon. The latter includes large heads, and dual mobility hip systems. Careful surgical technique and use of new technology have substantially reduced the dislocation rate after total hip arthroplasty in modern times.
Creating a Center of Excellence

Richard H. Rothman, MD, PhD
Rothman Institute at Thomas Jefferson University
Philadelphia, PA

The concept of super-specialization in surgery was developed by Sir John Charnley and published in the British Medical Journal in 1970. He predicted certain advantages including lower rates of complication, diminished cost, improved efficiency, and improved quality and quantity of research. All of these advantages have become manifest with the passage of time. This has been proven for high volume centers for heart surgery, cancer surgery, and neurologic surgery, as well as total joint replacement. My personal goals in 1970 were to create a Center of Excellence for Orthopaedics that included the highest quality, moderate cost, and compassionate care.

We are entering the era of accountable care organizations and the profession of Orthopaedics is assuming many of the characteristics of a public utility. There is a shift from quality to cost, from provider power to payer power, and from a profession to a public utility. It will exhibit the characteristics of being fungible, heavily regulated, and diminished quality.

The causes of the economic crisis include the increased expansion of the elderly population, expensive technology, medical-legal behavior, and the health patterns of our patients.

The strategies in this era will include use of a high volume surgical system, cost controls, improved leadership, and the use of leverage in negotiating with ACOs and health systems. Our experience has been based on a corporate academic model because it places the surgeon on top of the pyramid and in a position of control. This has resulted in a good quality faculty, good management, high productivity, and good resources. For the surgeon, a corporate model has resulted in high levels of satisfaction and, therefore, good retention, extraordinary productivity, solid monetary support for surgeons, good facilities and a sense of self-determination.

The productivity can be measured in terms of office visits, which in the past year exceeded 300,000, 23,000 surgical procedures, and 6,000 pain procedures.

The characteristics of leadership should include good health, emotional stability and happiness, and confidence.

This has proven to be an excellent matrix for academic orthopaedics.
Does Orthopaedics need Industry and does Industry need Orthopaedics? I believe the answer to this question is yes. The orthopaedic surgeons dream up new concepts for operative procedures, prosthetics, surgical techniques and design engineers of industry take the designs from the surgeon, create test models, test them in the laboratory and then work with the physician to use the results with patients. However, Orthopaedics and Industry must remain ethical in all of our dealings with each other. If we can’t remain transparent with each other, then stick problems develop which becomes a national embarrassment, investigations, which is bad news for Orthopaedics and Industry. Orthopaedic surgeons and Industry must remain Professional which includes being honest, trustworthy, ethical, and be known for our integrity and that we are willing to subordinate our interest for the interest of our patients.
Thoughts on Effective Teaching Basic Arthroscopy Skills

Howard J. Sweeney, MD
Northshore University Health System

Teaching is not equivalent to learning!
- A common belief is ‘If we teach it and they don't learn it...it is their fault!’
- My belief – this is wrong!

Think outside the box! Make it fun! Instruct one on one. Give immediate feedback. Keep it simple and in steps.

Motor skills must be done personally by the student and, preferably, done repeatedly.

Very few orthopedic programs teach motor skills. Common roadblocks include:
- Lack of time
- Lack of Money
- Lack of Interest
- Lack of metrics for motor skills

Help is necessary from the RRC and ABOS to mandate time for motor skills training in residency programs.

We should teach procedures in steps and plant visual pictures of each step in the student's brain.

To start we need a scope, camera, light source and laptop computer. Computer simulators are beautiful, evolving and expensive. We need simpler, cheaper, teaching tools especially for third world countries.

SUGGESTIONS:
1. Shining light cable through the lens in the scope will show the scope's field of view.
2. Scope rotation, camera orientation, triangulation depth perception, right and left handedness can be taught by looking at toys you recognize in a shoe box, or ‘operating’ on lettuce and cabbage under water.
3. Drilling anchor holes and Labral suturing can be taught on a wood block with attached cloth ‘piping.’
4. Margin convergence and anchor placement can be practiced on a small throw-away model (or make your own).
5. Knot tying can be learned at home with an instructive CD.

All the above should be learned before entering the operating room.
Rotator Cuff disorders are the most common cause of disability Related to the Shoulder
4.5 million annual visits to Physician/year
75,000 + repairs performed each year in United States

Indications for Repair – Still controversial
Not Standardized
Natural History not determined

Full Thickness Rotator Cuff Tears
<60 years – 6%
>60 years – 30%

Goals of Surgery
Improve pain and function
Tendon failures 11 – 95% at 2 year follow-up
Inferior Techniques
Massive tears
Age

Future
Biologic & Pharmacologic adjuvants
Improved Healing?
PRP
BMP
Growth Factors
Stem Cells

Rotator Cuff Tendon Insertion
Enthesis
Tendon Type 1 Collagen
Non-Mineralized fibrocartilage
Mineralized fibrocartilage
Bone

Current Repairs
None Replicate a normal Transisition Zone
Tendon Heals – Cells from Tendon and Paratenon
Stages
  Inflammatory
  Fibroblastic
  Remodeling
Repaired Tendon
  Fibrovascular Scar
  Mostly type 3 Collagen

Rotator Cuff Failure
Failure to restore normal histology at Repair Site
Intrinsic Tendon Degeneration
Fatty Infiltration of Tendon and Muscle
Muscle Atrophy

Surgical Techniques – Current
Seek to improve Tendon to Bone Healing
  Better Fixation Devices
  Pattern of Suture Repair
  Improved arthroscopic Knots

Operative Technique – Suture Bridge
Assess – Visualization
  Size of Tear
  Configuration
Preparation
Tendon Release if Necessary
Tuberosity Abraded
Suture – Anchor
  Convergence Stitch
  Medial Row – Horizontal Mattress
  Lateral Row – Suture Bridge
Post Operative Rehab

Sling, Pillow – 4-5 Weeks
Passive Exercise
AAROM – 4-8 wks
Resistance – 8 wks
Full Return, Heavy Demand – 6 months
Anterior cruciate ligament insufficiency in the skeletally immature is one of the most exciting areas of orthopedic sports medicine today. These case presentations will show physical exam findings under anesthesia and demonstrate the surgical technique of physeal sparing iliotibial band ACL reconstruction. This technique is indicated for preadolescents who have sustained an injury to the ACL or have congenital ACL deficiency and are experiencing instability of the knee.
Update on Hip Arthroscopy

Sherwin Ho, MD
University of Chicago
Current Concepts in Meniscus Injuries

Mark R. Hutchinson, MD
Professor of Orthopaedics
University of Illinois at Chicago

PURPOSE:
Present the current state of the art for identifying and treating meniscus injuries.

METHODS:
Use videos to present physical examination techniques to identify meniscus tears. Briefly review indications and common finding on MRI scans. Using a case base format, review arthroscopic findings and modern techniques to optimize repair and outcomes.

RESULTS:
The primary outcome measure is to assure that the audience will improve their diagnosis and knowledge regarding treatment options for meniscus tears.
Current Concepts in Throwing Injuries

Charles A. Bush-Joseph, MD
Rush University Medical Center

The review will discuss the anatomic and biomechanical factors that lead to injury in the throwing and overhead athlete. The increased prevalence of these injuries in the adolescent, high school and collegiate athlete require all who care to correct biomechanical problems before they develop into structural injury. Common injuries including scapular dyskinesia, GIRD, shoulder labral injuries, and elbow ligament problems are discussed. Current treatment algorithms are presented.
Patellofemoral Instability: State of the Art

Jason L. Koh, MD
Vice Chairman, NorthShore University Health System
Clinical Associate Professor, University of Chicago
Patellofemoral Foundation Travelling Fellow 2004

PURPOSE:
Patellofemoral instability is a significant source of pain and disability. Current understanding and treatment are discussed.

METHODS:
A review of the natural history, biomechanics, and treatment for this problem is presented.

RESULTS:
Patellofemoral instability has an extremely high rate of recurrence in patients with more than one dislocation. Anatomical factors that play a role in patella dislocation are described, including trochlear morphology, the relative relationship of the trochlear groove and the tibial tubercle, and the medial patellofemoral ligament. The physical exam and radiographic factors to evaluate are presented. The non-surgical and surgical management of patella instability are discussed. Practical technical tips and critical points are described for arthroscopic medial plication, medial patellofemoral ligament repair and reconstruction, and for distal realignment procedures. Significant elements of the rehabilitation are discussed.
Circular Fixation in Non-Plantigrade Charcot Foot Deformity

Michael S. Pinzur, MD
Loyola University School of Medicine

PURPOSE:
Charcot Foot has recently been recognized as being responsible for a severe negative impact on health related quality of life in affected diabetic individuals, often leading to severe disability and lower extremity amputation.

METHODS:
The author will present a demonstration of a novel new application of the Illizarov method for this highly morbid patient population.

RESULTS:
In a retrospective review of over two hundred patients treated with this method, half with draining wounds and osteomyelitis, a successful outcome can be achieved in over ninety percent of patients.
Malunion of Calcaneus Fractures: A Treatable Condition

Steven L. Haddad, MD
Illinois Bone and Joint Institute, LLC
Chicago, IL

PURPOSE:
(1) To discuss pathophysiology of calcaneal malunion to include the mechanism of injury of calcaneus fractures with subsequent deformity. (2) To describe methods of correcting calcaneal fracture malunion.

METHODS:
Reviewing prior work on methodology and success rates of treating calcaneal malunion, while critically assessing outcomes of described techniques, and proposing new methods of treatment.

RESULTS:
Results of initial treatments were artificially elevated, with methods of assessment less critical and discerning (with respect to fusion outcomes). Based upon multiple and frequent failures, alternative strategies to treat calcaneal fracture malunion are proposed. Results are more predictable with subtalar fusion (docking talar and calcaneal and talar surfaces in direct apposition) supplemented by a vertical slide calcaneal osteotomy to correct shortening and elevation. Older methods such as the Romash osteotomy remain technically challenging, and are probably no longer necessary with modern techniques. With primary docking of talar and calcaneal surfaces, earlier weight bearing is enhanced by the stability of the construct, and tibiotalar impingement is lessened by changing the talo-first metatarsal angle. Peroneal tendons require debridement and relocation, and reduction can be used as a guide to determine the magnitude of lateral calcaneal wall resection necessary to eliminate subfibular impingement. Rarely a fibula groove deepening procedure is necessary. Ultimately, by a carefully structured algorithm, calcaneal malunion can be reversed into a successful outcome.
Purpose:
Compare Consecutive Series of Arthroscopic Ankle Arthrodesis (AAA) vs Total Ankle Arthroplasty (TAA) for treatment of End Stage Arthritis.

Methods:
Retrospective Review of 14 AAA and 32 TAA Patients with 2-5 year follow up were evaluated by SF-36/ VAS and AOFAS Scores, clinically and radiographically.

Results:
The physical and mental components of the SF-36 scores were evaluated separately. The average amount of improvement in the SF-36 score physical component in the TAA group improved was 17.32 and 10.12 in the AAA group. The improvement was only statistically significant for the SF-36 physical component for patients in both the TAA group (P<0.0001) and the AAA group (P=0.0140).

The average improvement in the AOFAS score in the TAA group was 57.91 and 44.92 in the AAA group. This improvement was statistically significant for both the AA group (P=0.0002) and the TAA group (P<0.0001). VAS scores were also improved and statistically significant in both groups (P<0.0001 for TAA and P<0.0002 for AAA) with the average post-operative score being 2.79 for the arthrodesis group 2.36 for the arthroplasty patients.

When the mean difference in pre-and post-operative outcome scores were compared between the groups, none of the outcome scores showed a statistically significant difference.
The adult acquired flat foot, most commonly attributed to posterior tibial tendon dysfunction, involves a broad spectrum of etiologic factors, including congenital pes planovalgus, hypermobility, arthritides and deltoid ligament insufficiency.

Presenting symptoms range from mild fatigue during ambulation to a fixed, arthritic flat foot deformity. Treatment options range from immobilization and orthoses to tendon transfer, corrective osteotomy, or fusion for advanced deformity with arthritis.

This presentation will review various etiologies of the adult acquired flat foot, classification schemes, examination, nonoperative and operative treatment options, as well as a review of the current literature.
Chronic Instability of Syndesmosis after Rotational Ankle Fracture

Brian C. Toolan, MD
University of Chicago Medical Center
Foot & Ankle Service

PURPOSE:
To evaluate the results of reduction and stabilization of the syndesmosis with an endo-button for chronic instability after ankle fracture

METHODS:
Retrospective review of patients with chronic instability of the syndesmosis.

RESULTS:
A review of the literature and discussion of the diagnosis and management with be presented
Evidence-Based Medicine—Is Purity a Virtue?

Richard H. Rothman, MD, PhD
Rothman Institute at Thomas Jefferson University
Philadelphia, PA

Throughout the history of science many major advances have been created and documented with lower levels of evidence. These often do not come close to reaching level I evidence and yet have great value to our society. The question for today’s discussion is, “Is Purity a Virtue?”

Our goals as we formulate clinical research projects are to enhance the precision of our decision making and to be certain that our studies are relevant to the practice of medicine. This then brings us to the question today, “What is the role of lower levels of evidence?”

These include observational studies, case reports, editorials and single surgeon reports.

Perhaps the greatest advance for our elderly population has been the development of ocular lens implants by ophthalmologists. This relates to the observational study of Sir Harold Ridgley, one of World War II fighter pilots who suffered fragments of plexiglass from the windows of the pilot’s cabin. The benign reaction of the eye as observed by Sir Harold Ridgley led to the use of ocular implants, which are now extraordinarily valuable.

Case reports have been critical to the expansion of knowledge in orthopaedics and these include most recently the disease now known as cobaltism. These case reports have indicated a profound effect on hearing, cognitive function and cardiac function in the human.

Editorial observations on metal on metal and its deleterious effects preceded the scientific studies by two years and served as clear warnings well in advance of EBM.

The bottom line message is that while level I evidence is wonderful it will not be available to settle most issues in our lifetime.
Advances in Tendon Transfer Surgery

Michael S. Bednar, MD
Loyola University - Chicago

PURPOSE:
Discuss advances in tendon transfer procedures for tetraplegia.

RESULTS:
It is estimated that 70% of patients with cervical spinal cord injury resulting in tetraplegia may be candidates for upper extremity tendon transfer procedures that can improve elbow extension, lateral pinch, grasp and release. The goal of this session is to discuss which patients are candidates for tendon transfer procedures, what the procedures are, and what the rehabilitation is following the procedures. Current advances in tendon transfer procedures, such as use of the surgical laser to measure intra-operative sarcomere distance and use of the surgical robot, will also be discussed.
Ulnar Abutment Syndrome

Daniel J. Nagle, MD
Northwestern University Feinberg School of Medicine
Chicago, IL
Innovations in Wrist Ligament Repair and Reconstruction

Mark S. Cohen, MD
Professor, Director Orthopaedic Education
Director, Hand and Elbow Section
Rush University Medical Center
Chicago, IL

PURPOSE:
To review the pathophysiology and current treatment recommendations for wrist ligament injuries involving the scapholunate articulation. This is the most commonly disrupted ligament about the wrist.

METHODS:
Treatment strategies for acute and chronic ligament disruptions will be discussed, including outcome studies on the various surgical procedures.

RESULTS:
Currently, considerable controversy remains as to the preferred method of intervention for acute, subacute and chronic ruptures of the scapholunate interosseous ligament. This lecture will attempt to provide up to date current concepts and evolving strategies for this unsolved problem of the wrist.
FRIDAY ABSTRACTS
Objective:
Rotator cuff tears are common injuries that are often treated with surgical repair. Because of the high concentration of growth factors within platelets, Platelet-Rich Plasma (PRP) has the potential to enhance healing in rotator cuff repairs. A rat rotator cuff model is employed to test the biomechanical and histological effects of PRP augmentation on surgically repaired rotator cuff tears.

Methods:
PRP was produced from inbred donor rats. A tendon from bone supraspinatus tear was created surgically and an immediate trans-osseous repair performed. The control group underwent repair only. The PRP group underwent a repair with PRP augmentation. Rats in each group were sacrificed at 7, 14 and 21 days. The surgically repaired tendons underwent biomechanical testing including failure load, stiffness, failure strain, and stress relaxation characteristics. Histological analysis evaluated the cellular characteristics of the repair tissue.

Results:
At 7 and 21 day time periods, augmentation with PRP showed statistically significant effects on the biomechanical properties of the repaired rat supraspinatus tear, however failure load was not increased at the 7, 14 or 21 day time periods (p=0.688, 0.209 and 0.477 respectively). The control group had significantly higher stiffness at 21 days (p=0.006). The control group had higher failure strain at 7 days (p=0.02), whereas the PRP group had higher failure strain at 21 days (p=0.008). Histologically, the PRP group showed increased fibroblastic response and vascular proliferation at each time point. At 21 days, the collagen fibers in the PRP group were oriented in a more linear fashion towards the tendon footprint.

Conclusions:
In this controlled, rat model study, PRP altered the tissue properties of the supraspinatus tendon without affecting the construct’s failure load.
7 Day

Max Load 7 Day
p=0.686

Stiffness 7 Day
p=0.274

Strain 7 Day
p=0.020

Max Load 21 Day
p=0.477

Stiffness 21 Day
p=0.006

Strain 21 Day
p=0.008
INTRODUCTION:
Although discordance exists between clinical and radiographic profiles, it remains a
convention to diagnosis knee osteoarthritis (KOA) by ACR guidelines and its severity by KL
grades. This customary approach is in continuum because nothing better could be evolved.

OBJECTIVES:
This study was undertaken to resolve a much debated issue as to why clinical features do not
correlate significantly with radiological KOA.

METHODS:
We postulated that there might be a particular reason for wide variation in the degree to which
clinical symptoms relate radiographic KOA and vice versa. The discordance noted by many
authors is primarily due to the limitations of outcome measures in their radiographic study.
We extended the radiological features beyond those included in KL Grades and analyzed
them with clinical symptoms. 180 cases of primary KOA were profiled for demographic,
clinical and radiological features. All the radiographs were evaluated for individual
radiological features (IRF) on index knees by an Orthopedic Radiologist. Clinical scores were
separately correlated with IRF to look for an association.

RESULTS:
Pain & functional disability were significant with increasing KL Grades (p=0.03, p=0.02)
whereas stiffness was not. On analysis of individual radiological features, WOMAC- pain
was significant with subchondral sclerosis (p=0.04), joint space width (p= 0.02) and tibio-
 femoral alignment (p=0.02). VAS-pain was significant with later two and articular incongruity
(p=0.00). Functional disability was associated with medial joint space narrowing (p=0.02),
tibiofemoral alignment (p=0.03), loose bodies (p=0.04) and juxta articular osteopenia
(p=0.01). However in linear regression model pain and stiffness was significantly associated
with articular incongruity (p=0.00, p=0.01) and functional disability (p=0.04) and clinical
severity assessed by total WOMAC scores with juxta articular osteopenia (p=0.03).

CONCLUSION:
Articular incongruity emerged a truer representative of pain and stiffness whereas Juxta
articular osteopenia strongly correlated with physical disability and clinical severity in knee
osteoarthritis. This study has essentially analyzed many more of the radiological features
than in many previous studies and this may have contributed to the increased association
between clinical and radiographic features
Objective:
The patella is the largest sesamoid bone in the human body and transmits forces from the quadriceps muscle-tendon unit to the tibial tuberosity during knee motion. The influence of anatomic closure of a parapatellar approach to the knee joint on patella kinematics and range of motion has not been assessed adequately in the literature. Potential implications to knee kinematics in both the native knee as well as knees undergoing total knee arthroplasty (TKA) are not well characterized. This study hypothesized that closure of the knee arthrotomy influences patellar kinematics and leads to decreased range of motion.

Methods:
A parapatellar knee arthrotomy was performed in 7 fresh human cadaveric knees (4 patients). The incision was carefully marked and the arthrotomy was closed using figure-of-eight 5-0 ethibond sutures in different positions: In the anatomic position, or with the patella shifted 1.5cm or 3cm distal, or proximal relative to the patella ligament. Following each closure, patella movement kinematics and range of motion were recorded throughout multiple passive flexion-extension trials using an intraoperative TKA navigation system based on bony landmarks. Differences in patella movement characteristics and range of motion were
assessed at 30°, 45°, 90°, and 120° of flexion, and analyzed using one-way ANOVA with alpha error probability of 0.05.

Results:
Average maximum knee flexion was significantly reduced with the arthrotomy closure shifted 3cm distal (139 ± 6.4°) or proximal (133 ± 8.2°) relative to patella ligament compared to an anatomic closure (147 ± 4.1°). All arthrotomy closure positions significantly influenced patella rotation at 30°, 45°, 90°, and 120° of flexion (p<0.05) (Figure 2A). Closure of the arthrotomy with a 1.5cm or 3cm distal in relation to the patella ligament led to an increased lateral shift of the patella relative to the midline of the knee joint (Figure 2B). Patellar tilt was significantly decreased at 90° and 120° when the arthrotomy was closed 3cm distal, and at 120° when closed 1.5cm distal relative to the patellar ligament (Figure 2C).

Conclusions:
Patella kinematics and range of motion are significantly influenced by the position of the arthrotomy closure. A 3cm shift distal or proximal can produce limited flexion and potentially decreased functional outcomes following arthrotomy. Therefore, the correct position of the arthrotomy closure, as close to the anatomical position as possible, appears to be desirable for maximizing knee range of motion as well as re-establishing normal patellar kinematics. Placing markings with a surgical pen before knee capsule incision may decrease the risk of non-anatomic closure. Also, wound closure following TKA in flexion instead of extension has been shown to increase range or motion, which may be due to improved patella alignment and movement kinematics as a result of anatomic arthrotomy closure. The outcomes of this study have prompted us to increased attention to the correct closure of knee arthrotomies in slight flexion to potentially improve functional outcomes for patient undergoing medial parapatellar arthrotomy, particularly TKA patients.

![Figure 2. Characteristic average curves for patella rotation (A), midline shift (B), and patella tilt (C) for all different closure position.](image)
TITLE: Patient-Specific Factors and Co-Morbidities that Influence Mortality and Complications After Spinal Fusion: Results from a series of 5,887 patients

AUTHOR: Paul A. Carey, MD

AFFILATION: William Beaumont Army Medical Center/Texas Tech University Health Sciences Center

Objective:
The impact of specific patient-based factors and medical co-morbidities on the risk of mortality and complications following lumbar fusion has not been well described. Prior works are limited by small sample size, performance at a single center, or inability to generalize to a broad American demographic. This study sought to define patient-specific factors, co-morbidities, and surgical characteristics that significantly increased the risk of mortality and complications following spinal fusion in a large series of patients.

Methods:
The dataset of the National Surgical Quality Improvement Program (NSQIP) from 2005-2010 was queried to identify all patients who underwent spinal fusion procedures. Demographic information, body mass index (BMI), medical co-morbidities, type of surgery performed, operative time, ASA classification, and pre-operative albumin were recorded for all patients identified as having a spinal fusion. Mortality, the development of post-operative complications, as well as the presence of specific post-operative complications were also abstracted. Risk factors for mortality and complications were initially evaluated using chi-square and univariate logistic regression analyses. Risk factors that maintained p-values <0.2 in univariate analysis were then combined in a multivariate fashion that identified significant, independent, predictors of mortality and complications while controlling for other factors present in the model. Multivariate analysis resulted in odds ratios (OR) with 95% confidence intervals (CI) for each risk factor. Only those predictors with ORs and 95% CI exclusive of 1.0 and p-values <0.05 were considered statistically significant.

Results:
In the time-period under study, 5,887 patients receiving spinal fusion were identified in the NSQIP dataset. The average age of patients was 56 (range 16-90). Twenty-five (0.42%) patients died following surgery, while 608 (10%) sustained a complication. Wound infection was the most common specific complication, occurring in 2%. Age (OR 1.04 per year increase in age), albumin <3.5 (OR 13.8, 95% CI 4.6, 41.6) and pulmonary conditions (OR 4.6, 95% CI 1.7, 11.9) were found to exert a significant influence on the risk of mortality. Ages exceeding 80 years were found to carry the highest risk of mortality. Age, pulmonary conditions, BMI, wound contamination, number of medical co-morbidities, albumin <3.5 and increased procedural times increased the risk of complications (Table). BMI (OR 1.04 per point increase in BMI), number of medical co-morbidities (OR 1.65, 95% CI 1.1, 2.5), albumin <3.5 (OR 2.4 95% CI 1.2, 4.8) and increased procedural times (OR 2, 95% CI 1.3, 3.0) increased the risk of infection. When compared to posterolateral fusion, transfemoral lumbar interbody fusion did not increase the risk of mortality or complications, but reduced
the need for transfusion (OR 0.7, 95% CI 0.5, 0.9).

Conclusions:
The 5,887 patients in this analysis represent one of the largest cohorts used to model patient-specific predictors of complications and mortality in the orthopaedic literature. Several factors, including patient age, BMI, the absolute number of medical co-morbidities, pulmonary conditions, procedural times, and pre-operative albumin < 3.5 seem to influence the risk of post-operative morbidity. The risk factors identified here may be more generalizable to the American population as a whole due to the design and methodology of the NSQIP dataset.

Figure 1 – Forest plot depicting the Odds Ratio and 95% Confidence Intervals for risk factors in the model and their relation to mortality.
Objective:
Predictors of complications and mortality after hip fracture are poorly understood. This study endeavored to describe the impact of patient demographics, injury-specific factors, and medical co-morbidities on outcomes after hip fracture using the National Sample Program (NSP) of the National Trauma Data Bank (NTDB).

Methods:
The 2008 NTDB national sample was queried to identify patients who sustained hip fractures. Patient demographics, medical co-morbidities, injury-specific factors, and outcomes were recorded and a national estimate model developed. Primary outcomes included mortality, and the development of complications, while secondary measures consisted of the development of a major complication and specific complications such as pulmonary/cardiac complications, venous thrombo-embolic disease and infection. Potential risk factors evaluated in the model consisted of age, gender, shock at presentation, injury severity score, fracture pattern, time to first procedure, and medical co-morbidities. Unadjusted differences among risk factors were evaluated using the t-test or Wald chi-square analysis. Weighted logistic regression was performed for categorical variables and weighted regression analysis was used for continuous variables to identify statistically significant independent risk factors while controlling for others present in the model. Weighted analyses resulted in odds ratios (OR) for specific risk factors. Initial determinations were checked against a sensitivity analysis constructed with imputed data.

Results:
The weighted sample contained 44,419 incidents of hip fracture. The average age of patients was 72.7. Thirty-eight percent of the population was male, 6% was Black/African-American and 6% were Hispanic/Latino. Hypertension and diabetes were the most common medical co-morbidities. The mortality rate was 4.5% and 12.5% of patients sustained at least one complication. Dialysis (OR 6.7), presenting in shock (OR 3.7), cardiac disease (OR 2.9), male sex (OR 2.3), and ISS (OR 1.1) were significant predictors of mortality, while dialysis (OR 2.9), shock (OR 2.9) obesity (OR 2.5), cardiac disease (OR 2.5), diabetes (OR 1.4), and shorter time to procedure (OR 0.56 if procedure performed within 2 days) influenced complications. Obesity, femoral neck fracture, cardiac disease and diabetes significantly increased the risk of major complications and these same factors were also found to play a significant role in influencing post-operative infection. The presence of shock following injury was the most important predictor of complications with an odds ratio exceeding 10 for the development of cardiac complications (OR 13.9, 95% confidence interval (3.9, 49.6).
Conclusions:
This is the first study to postulate predictors of morbidity and mortality following hip fracture using a national model. While many co-morbidities appear to be influential in predicting outcome, some of the more significant factors include the presence of shock, obesity, diabetes, and time to surgery. The results of this study can have an important impact on patient and family counseling, as well as managing expectations, in the peri-operative period. Modifiable risk factors could also be targeted for optimization prior to surgery.
SATURDAY ABSTRACTS
TITLE: Arthroscopic Partial Trapeziectomy and Soft Tissue Interposition Arthroplasty for Symptomatic Trapeziometacarpal Arthritis

AUTHORS:
Jonathan Twu, BS, University of Illinois College of Medicine in Rockford, MS3
Kenneth Korcek, MD, Rockford Orthopedic Associates, Hand Surgeon
Brian Bear, MD, Rockford Orthopedic Associates, Hand Surgeon

Objective:
Arthroscopic partial trapeziectomy and soft tissue interposition arthroplasty is an effective treatment for symptomatic trapeziometacarpal arthritis.

Methods:
We retrospectively evaluated 30 consecutive patients with symptomatic thumb trapeziometacarpal arthritis Eaton-Littler stage 2 and 3. Treatment consisted of an arthroscopic partial trapeziectomy with soft tissue interposition utilizing an acellular dermal matrix as the interposition material. Post-operative care consisted of six weeks of thumb spica immobilization followed by four weeks of hand therapy comprised of range of motion and strengthening exercises. We evaluated pre-operative and post-operative visual analog patient reported pain, patient reported satisfaction, post-operative grip strength, appositional pinch strength, oppositional pinch strength, post-operative arthroplasty space and QuickDASH scores. The follow-up was an average of 12 months after surgery (Range: 6 – 24 months).

Results:
30 of 30 patients reported a reduction in pain. Pre-operative visual analog reported pain was averaged 8.2 and decreased to an average of 1.3 after surgery. (p < .00) 27 of 30 patients were satisfied with the outcome of the surgery. 27 of 30 patients would proceed with the same procedure again. 26 of 30 patients would recommend it to a friend. Satisfaction was directly correlated with a decrease in visual analog pain scores. (r = -.43, p = .02) 29 thumbs adducted fully in the plane of the palm and opposed the fifth metacarpal head. Post-operative grip, oppositional pinch and appositional pinch strength were 97%, 93% and 85% of the contralateral hand respectively. The mean arthroplasty space was 1.5 mm in satisfied patients and 1.0 mm in dissatisfied patients with a significant correlation between dissatisfaction and lower post-operative arthroplasty space. (p = .018) Pre-operative QuickDASH outcome scores were obtained and 10 patients averaged 42. Post-operative QuickDASH scores were obtained in those 10 patients and averaged 23 while the average of all 30 patients was 19. (p = .03)

Conclusion:
Short term analysis demonstrates that arthroscopic partial trapeziectomy with soft tissue interposition arthroplasty utilizing an acellular dermal matrix as the interposition material provides satisfactory pain relief, patient satisfaction, thumb motion and strength. Decreased postoperative arthroplasty space may be correlated to dissatisfaction.
Objective:
Given the prevalence of CMC arthritis in the U.S. population, there is much warranted discussion in the current literature about CMC arthritis and its various surgical treatment methods. However, there has been no study to date which has analyzed post-operative protocols and their respective efficacies. The objective of this study was to show that casting with prolonged immobilization after CMC interpositional arthroplasty provided no benefit over removable splinting with early mobilization in the parameters of subjective pain, range of motion, and length of follow up.

Methods:
Eighty patients’ surgeries and their follow-up were retrospectively reviewed, 39 in the non-casting protocol and 41 in the casting protocol. Utilizing physician and occupational therapy notes, subjective pain scores and length of follow up data were gathered. Also, change in and final range of motion for the MCP and IP joints, as well as change in and final radial abduction and opposition values, were gathered for each patient. The data were averaged for both groups and analyzed using a t-test. Surgical techniques were identical for all patients, and post-operative protocols differed only by 4 weeks of casting versus non-casting with early, controlled movements.

Results:
After collecting the data, the mean values for each protocol were obtained and recorded (Chart 1). After utilizing a t-test for comparison, no significant difference was found between the casting and non-casting groups when evaluating length of follow-up with the surgeon and OT, final ROM values, change in ROM in the IP and MP joints, as well as radial abduction. However, there was a statistically significant difference (0.02) when evaluating the change in opposition of the two groups, with the casting group having a greater change, 3.2cm compared to 1cm in the non-casting group.

Chart 2 shows the subjective pain findings in the two different protocols evaluated. The casted group had 5 individuals with no pain, 9 with mild pain, and 3 with moderate pain. The non-casted group had 9 individuals with no pain, 7 with mild pain, and 2 with moderate. Neither protocol after completion showed patients having severe pain. Overall, both the casted and non-casted groups had greater than 80% of individuals experiencing none to mild pain, 83% and 89% respectively.

Conclusions:
The null hypothesis is confirmed; there is no statistical advantage to a casting protocol versus a non-casting protocol following CMC interpositional arthroplasty of the thumb.
Also, though the casting group achieved a greater change in their opposition, the two groups reached very similar opposition values. This large change is very likely due to increased stiffness after prolonged immobilization and thus a larger initial value with which to compare the final opposition value. Weaknesses of the investigation include its nature as a retrospective study as well as the unavailability of some patients’ data due to the transition of paper charts into electronic medical records at this institution. The tenable next step is to perform a prospective study to commiserate with current data and allow for more detailed analysis.

<table>
<thead>
<tr>
<th>CHART 1</th>
<th>Treatment Groups</th>
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<tr>
<td>Variables</td>
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<th>CHART 2</th>
<th>Treatment Groups</th>
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<td>Pain</td>
<td>Casting</td>
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<tr>
<td>Mild</td>
<td>9 (53%)</td>
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<td>Moderate</td>
<td>3 (17%)</td>
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<td>Severe</td>
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</table>
TITLE: Bone Mineral Density Loss Following Combat-Related Lower Extremity Amputation

AUTHOR: James H. Flint, MD

AFFILIATION:
Department of Orthopaedics and Rehabilitation, Walter Reed National Military Medical Center, Washington, DC

Objective:
Combat injuries sustained in current and recent military conflicts have resulted in a relatively large population of previously healthy lower extremity amputees. The subsequent loss of bone mineral density (BMD) in the femora of these individuals has been largely unreported. As several of these patients have experienced femoral neck and acetabular stress fractures or low-energy insufficiency fractures during their rehabilitation, we sought to determine the incidence, severity, and associated risk factors for the development of low BMD following combat-related lower extremity amputation.

Methods:
We conducted a retrospective review of the records of all soldiers treated at our facility sustaining combat-related amputation between September 2005 and August 2011. Patients with unilateral or bilateral amputation who underwent one or more DEXA scans during the treatment period were included in our study population. The study group consisted of all amputated limbs with low BMD (Z-score less than -1.0); the control group consisted of amputated limbs with normal bone mineral density. Statistical analysis was performed to identify significant factors associated with the development of low BMD.

Results:
During the study period, 487 patients with combat-related lower extremity amputations were treated. Of those, 156 patients met inclusion criteria, representing 182 amputations (76 in the study group and 106 controls). The observed rate of low BMD was 42%. The average Z-score was -0.6 +/- 1.1 among unilateral amputations, and -1.1 +/- 1.0 among bilateral amputations (p=0.007). Risk factors for the development of low BMD were found to be a prolonged time to first ambulation (p= less than 0.001), prolonged time to regular ambulation (p= less than 0.001), bilateral amputation (p=0.017), more proximal amputation level (p less than 0.0001), and greater than 30 days outpatient anticoagulation treatment (p=0.038). Among unilateral amputees, there was a significant difference in the BMD of the amputated and intact limbs at the femoral neck and total hip regions (p less than 0.0001). Among patients who received a repeat DEXA scan, there was significant improvement in the total hip BMD (p=0.027).

Conclusions:
This study represents the largest of its kind in the literature, and specifically addresses a subpopulation of combat-related amputation. We found several variables to be associated with the development of low BMD, as well as a significant difference in BMD between the amputated and intact limbs of unilateral amputees. This supports the established idea that the severity of BMD loss is related to disuse atrophy of the bone. We conclude that there is
a significant relationship between early and regular ambulation in the development of low bone density post-amputation, and prevention of low bone density should focus on early and aggressive rehabilitation. Further studies would be beneficial to clarify the relationship between low BMD and associated risk factors, as well as to evaluate more definitively subsequent DEXA scans that would provide information on response to therapeutic treatment and changes in BMD long after rehabilitation is complete and regular weight-bearing status has either been achieved or plateaued.
Objective:
To point out that physical diagnosis was a core component of spinal deformity assessment throughout most of the 20th century, but in recent years an AP radiograph paradigm has emerged that dominates decision making in scoliosis surgery with physical diagnosis now relegated to nearly an obsolete status.

Methods:
Literature review and author’s experience

Results:
School screening for scoliosis is being phased out in many states because the government has concluded that its impact is not enough to justify its cost. Correction of the Cobb angle on the AP radiograph is now the most important assessment metric for scoliosis surgery success. But is this radiographic gold standard all we need for the best care for our scoliosis patients, or are we ignoring the patient and their real problems while we gaze with undivided attention at their AP radiograph? The typical scoliosis patient is brought to an orthopaedist because parents, teachers, family physician, or school nurses have noticed a back asymmetry, or the curve is noted on a radiograph taken for other reasons or for back pain. Scoliosis is a 3-dimensional deformity of the spine and rib cage, easily appreciated on physical examination, poorly appreciated on a 2-dimensional AP radiograph, but the radiograph always wins out in importance in these modern times.

Conclusions:
Recognizing this attitude is short sighted and does not serve our patients well, it is time to change our approach in scoliosis surgery, re-emphasizing the role of physical examination in diagnosis and characterization of spine deformity and how it responds to surgery. As Dr. John R. Cobb once wrote in 1958, “In the future study of scoliosis it will be necessary to keep our eye on the patient and not on the curve”.
Objective:
Outcomes following a plated ACDF and either a TM interbody fusion device or an interbody bone graft for one-level cervical degenerative disease were compared. These two groups of patients participated in a larger prospective randomized controlled IDE study.

Methods:
This was a prospective, randomized, multi-center study. The primary inclusion criteria were single-level symptomatic cervical disc disease from C3 to T1 with radiculopathy or myelopathy. Patients were randomized into a control or TM group. Patients in the control group had the option of allograft or autograft. The TM group had anterior screw plate-augmented ACDF in which a trabecular metal cervical interbody fusion device TM-100 was placed in the interbody space. The control group had the same procedure, except that allograft or autograft bone was used in the interbody space. 127 patients were randomly assigned to the TM or control groups, at eleven investigational sites in the US. There was a 3:2 randomization ration. 74 patients were randomized to the TM group and 53 to the control group. Patients were assessed before surgery and postoperatively at 6 weeks, 3, 6, 12 and 24 months. At each time point, patients completed the Neck Disability Index (NDI) and the SF-36. SF-36 responses were used to calculate the physical (PCS) and mental health component summaries (MCS), indicators of quality-of-life status. Blood loss, surgery duration, and hospital stay were recorded. A/P neutral lateral, flexion and extension radiographs were obtained pre-operatively and at the 6, 12, and 24 month follow-up visits.

Results:
Mean age was 44 years in both groups. Females represented 58% of the TM group and 47% of the control group. Sympton duration, age, BMI, smoking, working status, compensation issues and operative levels were not different between groups. Fifty patients in the control group received allograft and three received autograft. There was no difference in blood loss, operative duration and hospital stay between the two groups. The fusion rates for TM at 6, 12, and 24 months were 80%, 83% and 92% respectively. For bone graft at the same time points, fusion rates were 62%, 70% and 94%. The difference in fusion rates at six months approached significance with p=0.07. Mean NDI improved from 40.3 preoperatively to 40.5 at six weeks, 46.1 at three months and 48.2 at 88...
24 months in the control group. In the TM group, the improvement in the average PCS was almost identical, from 37.3 preoperatively, the 40.9 at six weeks, 46.2 at three months, and 48.2 at 24 months. The mean MCS was unchanged at every time point assessed for both groups.

Conclusions:
The results show that both TM and bone graft yield a high fusion rate and clinically meaningful improvements in patient health. Differences in fusion rates at six months suggest an earlier fusion with TM. TM obviates any problems associated with a secondary harvest procedures, immunogenicity and disease transmission.
Objective:
Recreating joint mechanics similar to the patient's normal knee during ACL reconstruction has been suggested as a means to reduce negative effects such as risk of graft failure and progression of osteoarthritis. Properties such as graft laxity are thought to affect these mechanics. There is debate whether a single bundle (SB) or double bundle (DB) reconstruction best recreated the graft characteristics of the normal knee. The purpose of this clinical study was to compare the laxity of the ACL reconstructed knee to the normal knee between SB and DB patients.

Methods:
84 SB and 26 DB had undergone ACL reconstruction and participated in the IRB-approved protocol. Patients were positioned in a robotic knee test system with electromagnetic sensors placed bilaterally on proximal anterior tibias, patellae, and the anterior thighs. The system bilaterally cycled the knees into anterior and posterior translation to a target AP force threshold equal to 100 N greater than the mass of the low leg. Seven cycles were performed, with stress-strained curves generated from the means of the normalized kinemativ data of the last three cycles. The normal knee curve was subtracted from the reconstructed knee curve revealing the differences in translation (mm) throughout the loading cycle. The mean translation difference over the last quintile of the loading cycle was chosen to represent differences in endpoint laxity with a value of zero indicating perfect matching and values deviating from zero indicating a 'looseness' value. SB and DB values were compared using an independent t-test with significance set a priori at p=.05.

Results:
SB was looser than the normal knee by 4.4 +/- 3.0 mm (mean +/- SD) while DB was also looser but by only 3.0 +/- 2.0 mm. SB was shown to be significantly looser than DB (p=.035)

Conclusion:
SB was shown to significantly deviate more from the normal knee than DB. These data suggest that a DB procedure may produce laxity characteristics that more closely resembles the knee. A relation may exist between laxity and outcome scores which have shown several improvements with DB when compared to SB. The magnitude of deviation from relative normality, regardless of direction (too loose or tight), may also have an effect on future pathology such as osteoarthritis.
Objective: Shoulder instability and dislocation are significant topics of discussion among the orthopaedic sports literature, particularly regarding the incidence and outcomes of such injuries. Much has been published evaluating these factors in the civilian population, less so in a military cohort. The United States Naval Academy (USNA) accepts several students per year only after granting a waiver for preexisting shoulder conditions (dislocation and/or instability). Of particular interest in this young, active population is whether preexisting shoulder pathology predisposes patients to repeat injury, and the personal and professional implications associated with recurrence. In an effort to address this question, we sought to evaluate the incidence of recurrence of glenohumeral dislocation/instability, as well as evaluate the implications of recurrent injury (and sometimes recurrent surgical repair) on individual graduation, service selection and military occupation.

Methods: We conducted a retrospective review of approved medical waivers at the USNA over a two-year period to identify patients who met inclusion criteria. All students accepted after receiving a medical waiver for preexisting shoulder instability or dislocation were included in our study and followed for the entirety of their rigorous training at the USNA. The study group comprised patients who had recurrent shoulder instability or dislocation; the control group were those who did not have a recurrence. Statistical analysis was performed to identify risk factors for recurrence.

Results: In the initial two-year waiver period studied, 18 patients with preexisting shoulder conditions were identified. 67% (12/18) of these patients were treated operatively for their injury prior to matriculation at the USNA, and the majority of initial injuries were the result of participation in a contact sport. While at the USNA, 39% (7/18) had recurrence of shoulder instability or dislocation. 86% of these patients (6/7) had a recurrence within the first two years at the USNA. Though not statistically significant, 33% of patients treated operatively initially had a recurrent event after matriculation, compared to 50% of those treated non-operatively. We found no association between age, gender, or sport participation and recurrent shoulder instability/dislocation. Recurrent shoulder injury had no obvious impact on graduation, military service selection, or military occupation.

Conclusions: Our preliminary data show a 39% incidence of recurrent dislocation, with a predilection for those treated non-operatively initially. Of the 12 patients who were initially treated operatively, 33% of those had a failure of their repair during their time at the USNA.
Comparatively, 50% of those treated non-operatively for their initial instability event had a recurrence. These rates differ greatly from previous reports, which show more extreme values for operatively and non-operatively treated shoulders (22% & 92%, respectively, in one study). We found no significant risk factors for recurrence; however, our current population is small, representing only two classes at the USNA. This study is currently being expanded to include an 11-year period (11 classes), to increase the power of our statistical analysis. Even in its current state, this study provides valuable information regarding survivability of prior surgical repair and recurrence rates of shoulder injury among students accepted after medical waiver to a physically demanding service academy. This information is particularly relevant to any organization (military or civilian) considering accepting, training or hiring students, cadets, athletes, etc. with preexisting shoulder pathology.
Objective:
Osteoarthritis (OA) of the knee is a common condition, especially with the increasing age of the U.S. population. Currently, there is no curative therapy for osteoarthritis and clinical treatment goals are to reduce pain and prevent disability. Optimal management generally requires a combination of both nonpharmacological and pharmacological therapies. Hyaluronan intra-articular injection for the treatment of OA of the knee was approved by the FDA in 1997 and has a very good tolerability profile with few serious side-effects. There are a number of commercially available hyaluronans in the U.S. and these preparations are either naturally-derived or produced by covalently cross-linking hyaluronan molecules. Over the last several years, there has been accumulating evidence of a unique safety concern associated with the cross-linked hyaluronans; pseudosepsis, also termed severe acute inflammatory reaction, which is clinically distinct from local inflammatory reactions. Pseudosepsis of the knee can be defined clinically by the following characteristics (1) severe inflammation of the joint often with significant cellular effusion and significant pain normally occurring within 24 and 72 hours after intraarticular injection; (2) occurs after exposure to more than one injection or before sensitization, such as the second or third injection of first course, or after an injection of a repeat course; (3) sepsis or pseudogout are ruled out because of the absence of infectious agents and calcium pyrophosphate crystals in the synovial fluid; (4) other distinctive characteristics may include high numbers of mononuclear cells infiltrating the synovial fluid from the surrounding membrane; and (5) pseudosepsis generally is not self-limiting and often requires clinical intervention. The cost of managing this reaction and its overall economic burden has not been studied. Therefore, the objective of this research is to quantify the medical resource utilization and cost associated with treating pseudosepsis.

Methods:
Peer-reviewed literature was used to document the epidemiology of OA and pseudosepsis. Practice patterns and medical resource utilization associated with the treatment of pseudosepsis was based on the literature and a comprehensive survey of 42 orthopedic surgeons and pain specialists. Resources included those that would be reimbursed by a typical public or private payer such as office visits, diagnostic tests, procedures, and inpatient admissions. Standardized costing algorithms (e.g., Medicare fee schedules) were used to monetize the medical resources and determine the expected cost of a pseudosepsis event as well as the overall economic burden from the perspective of a U.S. health plan or in the entire U.S. population.
Results:
The estimated cost of treating a pseudosepsis event ranged from $682 to $914 for a
typical public (Medicare) and private payer, respectively. Although pseudosepsis does
not commonly require hospitalization (<10% of cases), inpatient admission was the key
cost driver responsible for approximately 75% of the total estimated cost. Arthrocentesis
and physician office visits accounted for 11% and 15% of the total cost, respectively.
Using conservative estimates of OA prevalence, percentage of patients treated with hylan
viscosupplementation, and the rate of pseudosepsis, the estimated economic burden of
treating pseudosepsis to a hypothetical one-million member U.S. payer is $128,328 (2011
U.S. dollars). When extrapolated to the entire U.S. population, the estimated economic
burden is $39.6 million. Using less conservative estimates, but within the range cited in the
literature, the total cost may exceed $150 million.

Conclusions:
Although pseudosepsis is not commonly considered a frequent adverse event associated
with viscosupplementation, the overall cost to U.S. payers may be greater than expected, due
to increased medical resource utilization. Taking steps to avoid pseudosepsis may reduce
the overall cost of treating osteoarthritis of the knee with viscosupplementation. Although
this research is preliminary, it uses conservative assumptions and does not account for the
economic or quality-of-life impact of pseudosepsis on the patient. Therefore, further study
is warranted to more comprehensively document the overall burden of pseudosepsis and the
benefits that may be achieved by its prevention.
Objective:
There were many reports which proposed about the impacts of the foot and ankle conditions to the quality of life. Little was known about the factors associated with poor quality of life in patients with foot and ankle conditions. The aim of this study is to determine the factors affecting the quality of life in patients with traumatic or non-traumatic conditions of the foot and ankle prior to their definitive treatments. The validated outcome score (Visual Analogue Scale-Foot and Ankle (VAS-FA)) was additionally used to measure and examine the relationship with the quality of life.

Methods:
In 2010-2011, a prospective cross-sectional study was performed in 70 patients (70 feet) with traumatic or non-traumatic conditions of the foot and ankle. All patients were examined by an experienced orthopedic surgeon. The Short Form-36 (SF-36) and VAS-FA questionnaires (ranges from 0 [worse] to 100 [excellent] points) were distributed to all patients to complete to evaluate the health-related quality-of-life and the clinical impairment, respectively. After the completion of the SF-36 data, all patients were divided into two groups regarding their levels of total SF-36 score which based on the normative reference. Group I (21 patients) and II (49 patients) were patients who had unsatisfactory (total SF-36 score: < 60) and satisfactory (total SF-36 score: ≥ 60) level of the quality of life, respectively. All patient demographics, clinical variables, and the VAS-FA scores were collected and compared between the two groups to determine the solid factors affecting the levels of quality of life.

Results:
Mean duration of symptoms was 3 months. Mean age was 36.5 years for group I and 34.6 years for group II (p = 0.623). Mean total VAS-FA score was 63.1 for group I and 83.6 for group II (p < 0.001). Correlations between SF-36 and VAS-FA scores were strong and moderate regarding the components of functional (r = 0.54, p < 0.001) and total scores (r = 0.46, p < 0.001). Linear regression analysis demonstrated the high prognostic significances of the functional and total VAS-FA scores with the cutoff scores as <55 and <57.5 for the optimum identification of the unsatisfied quality of life (p < 0.001). For the clinical variables, the midfoot involvement was an only main factor affecting the unsatisfied quality of life in the univariate (odds ratio [OR], 3.11; 95% confidence interval [CI], 1.23-7.86, p = 0.013) and the age- and sex-adjusted regression analysis (OR, 4.41; 95%CI, 1.29-15.04, p = 0.018).
In addition to these findings, there were no significant differences between the two groups
in terms of all other demographics including genders, causes of condition (traumatic versus non-traumatic), p > 0.05).

Conclusions:
The present study concluded that the main factors affecting the unsatisfied quality of life, in patients with traumatic or non-traumatic foot and ankle conditions, were the low level of functional and total VAS-FA scores, and the midfoot involvement. Traumatic cause was not associated with poor quality of life. In both traumatic and non-traumatic conditions, physicians should particularly focus on the patients who present the main components associated with functional disturbances and lesions at midfoot area which is the important structural zone in terms of the plantar load distribution in the foot.
Purpose:
Femoral neck fractures are a major public health problem and a common injury encountered by Orthopaedic Surgeons. Multiple screw fixation is the most commonly used surgical technique for the treatment of nondisplaced femoral neck fractures. The purpose of this study was to determine the rate of osteonecrosis and nonunion requiring revision surgery following percutaneous screw fixation of nondisplaced femoral neck fractures in patients > 65 years of old.

Methods:
A retrospective case series of all patients > 65 years old with nondisplaced femoral neck fractures secondary to low-energy trauma treated surgically between 2005-2008 was performed. 120 patients. All fractures were treated surgically with percutaneous screw fixation (cannulated screws). Capsulotomy or needle aspiration of the fracture hematoma was not performed. Radiographs, operative reports, and medical records were reviewed. Fracture union, nonunion, osteonecrosis, capsulotomy, infection, intra-articular hardware, loss of fixation, conversion to arthroplasty were noted.

Results:
10 patients (10/121 10%) required conversion to total hip arthroplasty. 4 patients had loss of fixation in the early post-operative period, 6 patients went on to non-union, 2 patients had osteonecrosis, 2 patients had peri-implant subtrochanteric femur fractures requiring surgical repair.

Conclusions/Significance:
Rates of revision surgery of nondisplaced femoral neck fractures may be higher than previously reported in the literature. The etiology is likely multifactorial.
Welcome New Members

L. Thomas Cashio, MD ................................. New Orleans, LA
Terrance Devlin, MD ........................................ Lafayette, IN
Per Freitag, MD, PhD ................................. Springfield, IL
Thomas Gleason, MD ................................. Glenview, IL
Roland A. Hester, MD ................................. Montgomery, AL
James Kudrna, MD, PhD ............................. Glenview, IL
Harold Rees, MD ........................................ Oak Park, IL
Jeffrey R. Sawyer, MD ............................... Germantown, TN
Mark Sokolowski, MD ............................... Naperville, IL
NECROLOGY LIST

A
Abbott, LeRoy C.
Acker, Robert B.
Agins, Howard J.
Ainsworth, William H.
Aitken, George T.
Albrecht, Franklin H.
Allard, L. W.
Aldredge, Rufus H.
Allen, H. R.
Allison, Nathaniel
Alsfielder, S. Russell
Altenberg, Alfons R.
Amspacher, James C.
Anderson, Harry O.
Anderson, Lewis D.
Andre, Harvey M.
Ashby, J. Jefferson
Atmore, William G.

B
Bacon, J. H.
Badgley, Carl E.
Bailey, G. L.
Bailey Robert W.
Baird, William A.
Banks, Sam
Banks, Tyre E., Jr.
Bannerman, Moss M.
Barber, C. Glenn
Barker, William E.
Barnett, Harry E.
Barnhart, Joseph M.
Bartels, Wilbur W.
Barton, Francis W.
Batman, Gordon W.
Battalora, George C.
Bauman, George L.
Beatty, B. W.
Beer, John J.
Bell, James P.
Bence, A. E.
Bender, Jr., Theodore J.
Bendixen, Peter A.
Berkeheiser, E. J.
Bershon, Albert L.
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Bickel, William H.
Billington, R. Wallace
Bishop, Jr., W.A.
Blackwell, Donald S.
Blake, Thomas H.
Blanchard, Wallace
Bland, William Griffin
Blodgett, William E.
Blodgett, William H.
Blount, Walter P.
Blunck, Conrad F.
Bohne, William R.
Bombach, Jaren D.
Bost, J. R.
Bowman, Harold S.
Boyd, Harold B.
Boyd, John F.
Brady, Thomas
Brainard, Clifford W.
Brand, Paul Wilson
Breck, Louis W.
Brewer, Bruce J.
Brindley, Hanes
Brown, Frederic W.
Brown, Joseph E.
Brown, Marion G.
Brown, Robert R.
Brumbaugh, Herbert L.
Bryan, Richard S.
Bungardt, Alfred H.
Burney, Dwight W., Jr.
Burns, Robert E.
Bywaters, Theodore W.

C
Calandruccio, Rocco A.
Caldwell, Gene D.
Caldwell, Guy A.
Callander, C. N.
Cain, Thomas
Cameron, David M.
Campbell, Willis C.
Canales, Gregoria M.
Carlander, Lester W., Jr.
Carlson, Milton R.
Carothers, Robert
Carpenter, Jr., George K.
Carr, Bradley W.
Carr, Lewis R.
Carrell, Brandon
Carrell, William Beall
Carruthers, F. Walter
Carter, Ralph M.
Caspers, Carl G.
Cassidy, Robert H.
Chandler, Fremont A.
Chatterton, Carl C.
Chollet, Burt G.
Clark, Robert R.
Clark William A.
Claussen, Bruce F.
Clayton, Charles F.
Clayton, Mack L.
Cofield, Robert B.
Cole, Bart
Cole, Wallace H.
Cole, Walter F.
Colonna, Paul C.
Collopy, Paul J.
Colvin, Alex R.
Comfort, Thomas
Compere, Clinton
Compere, Edward
Conn, Harold Russell
Conrad, Marshall B.
Conwell, H. Earle
Cooper, Hugh E.
Costen, William S.
Cotten, Stonie
Coughlin, Jr., Dennis
Coventry, Mark B.
Cowle, Arch E.
Crawford, John A.
Cress, Ronald D.
Crego, C. H., Jr.
Crenshaw, A. Hoyt
Culley, Thomas
Culmer, Ausmon E., Jr.
Cunningham, Samuel B.
Curtis, Frank E.
Czaja, Leo M.

D
Davis, Sam J.
Davis, William M.
Dawson, Clyde W.
Davis Jr., Paul M.
Day, A. Jackson
Day, Philip L.
Denham, Jr., Robert H.
Desch, Charles A.
Dickson, Frank D.
Dickson, James A.
<table>
<thead>
<tr>
<th>Name</th>
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Keagy, Robert D.
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Key, J. Albert
Kidner, Frederick C.
Kiene, Richard H.
Killeffer, John J.
Kimbrough, Robert F.
King, Joe W.
King, Robert T.
King, Walter W.
Kingsley, Daniel M.
Kitchen, Benjamin
Kitterman, H. E.
Klein, Armin E.
Klein, Elmer A.
Klinefelter, M. L.
Knight, Marvin P.
Knight, Robert Allen
Knodt, Herbert
Kremchek, Edward
Kreuscher, Philip H.
Krigsten, William M.
Kroll, Harry G.
Kulowski, Jacob
Kurtz, James F.
Kuth, Joseph R.

L

Lacey, Henry B.
LaFerte, Alfred D.
LaFerte, Daniel
Lambert, Claude N.
Lance, Jr., John F.
Lannin, Donald R.
Larmon, William A.
Larson, Carroll B.
Lea, Robert B.
Leatherman, Kenton
Ledbetter, Jr., Roy H.
Leimbacher, Earl
Levy, Sr., Louis J.
Lewin, Philip
Leydig, Stanley
Link, Joseph A.
Lipscomb, Sr., Paul R.
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Litton, Lynn O.
Lockhart, LeRoy D.
Logue, Richard M.
Loiselle, Albert O.
Lord, John Prentiss
Lutter, Lowell D.
Lynam, T. P.

M

MacDonnell, James A.
Macey, Harry B.
MacPherson, Ford John
Maddox, Robert
Magnuson, Paul B.
Manning, K. Randolph
Margo, Elias
Marsalka, David S.
Marsh, Henry O.
Martz, Carl D.
Matchett, Foster L.
Mateskon, Victor
McBride, Earl D.
McCabe, John O'D.
McCain, Donovan L.
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McDonald, John Laing
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McElroy, Glenn L.
McElvenny, Robert T.
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McGinnis, Albert E.
McGraw, Wilbert H.
McKeever, Duncan C.
McKinnon, A. P.
McReynolds, L. S.
Mellen, Richard H.
Mercer, C. W.
Meyer, Alphonso H.
Meyer, Benjamin S.
Meyer, Paul W.
Meyerding, H. W.
Miller, Alexander
Miller, Donald S.
Miller, James E.
Miller, Leo Frederick
Miller, Orville
Miller, Owen E.
Miller, Paul R.
Miller, Robert J.
Milligan, John J.
Milliken, Robert Addison
Mitchell, C. Leslie
Mitchell, John
Mitchell, Joseph I.
Mladick, Edward A.
Mock, Harry E.
Moe, John H.
Molin, Edwin L
Montgomery, Robert P.
Moore, Beveridge H.
Moore, Jr., Moore
Moore, Robert D.
Moore, Thomas
Morgan, Harry C.*
Morrill, Gordon
Morris, Harry D.
Mroz, Rudolph
Mumford, E. Bishop
Muro, Felipe
Murphy, Frank C.
Murphy, John Patrick
Murphy, Owen B.
Murray, John A.
Murray, Robert A.

N

Nellen, James William
Nelson, H. D.
Neumann, Roland F., Jr.
Newman, William Vernon
Nichol, Adam G.
Niemann, Kurt M.W.
Ninez, Francis N.
Noell, Robert L.
Norcross, John R.
Norman, William H.

O

O'Brien, Robert M.
O'Connor, Gerald A
O'Connor, Sylvester J.
Odell, Richard T.
O'Donnell, James J.
O'Donoghue, Arch E.
O'Reilly, John F.
O'Reilly, J. Archer
Orr, H. Winnett
Overton, Lewis M.
Owen, W. Barnett

P

Packard, Robert G.
Page, Manley A.
Papurt, Louis E.
Parker, G. A.
Parrish, Frank F.
Patterson, Robert F.
Payne, John
Peabody, Charles W.
Pease, Charles N.
Pedersen, Herbert E.
Pendy, John M.
Penn, Herschel
Perlman, Robert
Phalen, George S.
Pickard, Nicholas S.
Pipkin, Garrett
Pomeroy, Richard
Porter, John Lincoln
Post, Melvin*
Powers, John W.
Prevo, Samuel B.
Price, William H.
Purcell, Frank H.
Pusitz, M.

R
Radkowski, Casimer F.
Radtke, H. P.
Rainey, C. L.
Rath, Edward Kenneth
Ray, R. Beverly
Reed, Charles A.
Reef, Thomas C.
Regen, Eugene M., Sr.
Reich, Rudolph S.
Reid, John G.
Reiley, Richard E.
Reynolds, Fred C.
Richards, Jr., James F.
Ridlon, John
Riley, James M., Jr.
Ritter, Robert O.
Roberts, Fowler B.
Roberts, James Gordon
Robertson, Robert C.
Roche, Maurice B.
Rogers, S. Perry
Rogers, Sion Clay
Rombold, Charles R.
Rosenerg, Norman J.
Rountree, C. R.
Russell, Donald E.
Ryerson, Edwin W.

S
Sachtjen, Kenneth M.
Salovich, Edward L.
Schauffler, Robert McE.
Scheer, George
Schlesinger, Lee C.
Schmidt, Albert C.
Schneider, Chester C.
Schneider, Howard W.
Schnute, William L.
Schock, Robert D.
Schum, Herman C.
Schwartzmann, J. R.
Schwingel, William H.
Scott, Jr., Daniel J.
Scuder, Carlo S.
Secord, Eugene W.
Seidler, Ferdinand
Selakovich, Walter G.
Selleseth, I. F.
Shapiro, Fred
Shelton, George W.
Shepanek, Leonard A.
Shepard, Cassius M.
Sherrill, John D.
Shindler, Thomas O.
Shorbe, Howard B.
Shuler, Lacey L.
Sideman, Sidney
Sigmond, Harvey W.
Simon, H. Theodore
Sisler, Wade
Smith, Edward
Smith, Lemuel D.
Smith, Lyman
Smith, Richard D.
Smith, William S.
Snyder, Clarence H.
Soboloff, Hyman R.
Sofield, Harold A.
Spankus, Jack D.
Speed, J. S.
Starin, Louis M.
Stark, William A.
Staufeler, Richard C.
Stein, Arthur H., Jr.
Steindler, Arthur
Steinfeld, Alexander Michael
Stephenson, George B.
Sterne, Walter G.
Steward, Dudley M.
Stewart, Marcus J.
Stewart, J. Edgar
Stewart, William J.
Stone, Charles A.
Stool, Newsom
Stovall, Sidney

T
Tait, C. M.
Tanner, Henry S.
Tarpley, William
Tate, C. H.
Teal, Fritz
Test, Frederic C.

V
Van Demark, G. E.
Van Driest, John J.
Veley, David
Vinke, Theodore H.
von der Wyer, William H.

W
Wainscott, Clinton S.
Waismian, Raymond C.
Walker, James C.
Walsh, Francis P.
Waring, Thomas L.
Waters, Chester H., Jr.
Weaver, James B.
Weinstein, Leonard
Werndorff, Karl Robert
Wheeler, Joseph E.
Whiston, Gordon C.
White, Edgar H.
White, Jr., John B.
Whitecloud, III, Thomas S.
Whittemore, Wendell L.
Wickstrom, Jack K.
Wilcox, Henry W.
Willens, Samuel D.
Williams, Paul C.
Williamson, George A.
Willis, Theodore A.
Wilson, Dale
Wilson, Edward H.
Wilson, Judson D.
Wiltberger, Benjamin R.
Wirka, Herman W.
Wittenstrom, Eugene C.
Wolcott, W. Eugene
Wolgamot, John C.
Wolin, Irving
Wood, Francis C.
Woodard, Robert L.
Woodward, Joe W.
Wray, Robert M.

Y
Yancey, Daniel L.
Yelton, Chestley
Young, H. Herman

Z
Zeligs, I. Mark
Zenni, Edward J.
Clinical Orthopaedic Society

MEMBERSHIP 2012

Alphabetical Membership Directory
Adams, Jeffrey
Regular Member
1050 N James Campbell Blvd
Ste 200
Columbia, TN 38401
Phone: 931-388-4276
Fax: 931-380-1562
E-mail: adamsjtdoc@aol.com
Member since: 2002
Spouse: Tina

Allen, Richard
Emeritus Member
227 East Emmett Street
Battle Creek, MI 49017
E-mail: pattywallen@sbcglobal.net
Member since: 1978
Spouse: Patricia

Agarwal, Animesh
Regular Member
UTHSCSA
Div of Ortho Trauma
7703 Floyd Curl Dr., MC 7774
San Antonio, TX 78229-3901
Phone: 210-567-5154
Fax: 210-567-3113
E-mail: agarwal@uthscsa.edu
Member since: 2006
Spouse: Jennifer

Allen, William
Emeritus Member
Univ. of Missouri Med. Center
1 Hospital Dr. MC 213
Columbia, MO 65212
Fax: 573-882-1760
E-mail: allennw@health.missouri.edu
Member since: 1993
Spouse: Kathryn

Ahstrom, Jr., James
Emeritus Member
4 Oak Brook Club Drive G106
Oak Brook, IL 60523-1328
E-mail: jamespahstrom@aol.com
Member since: 1960
Spouse: Harriet

Allen, III, Herbert
Regular Member
601 Bishop Lane, N
Unit 811
Mobile, AL 36608-5839
Phone: 850-460-2667
Fax: 850-460-2670
E-mail: hallenmd@aol.com
Member since: 2009
Spouse: Jan Allen

Alfred, Karl
Emeritus Member
257 Bayview Ave
Naples, FL 34108-2139
Phone: 216-292-4662
Member since: 1960
Spouse: Mollie

Anderson, Gunnar
Regular Member
Rush University Medical Center
Rm 201 - Orthopaedic Building
1653 West Congress Parkway
Chicago, IL 60612
Fax: 312-942-2101
E-mail: Gunnar_Andersson@rsh.net
Member since: 1989
Spouse: Kerstin
Apfelbach, Henry  
Emeritus Member  
1100 Pembridge Drive  
Apt 301  
Lake Forest, IL 60045-4216  
Member since: 1964  
Spouse: Priscilla

Bardenstein, Maxwell  
Emeritus Member  
1305 Baldwin Ave  
Ann Arbor, MI 48104-3624  
Member since: 1966  
Spouse: Renah

Baehr, James  
Emeritus Member  
10 Meadowlark Lane  
Hilton Head Island, SC 29926-1370  
E-mail: jmbaehr@aol.com  
Member since: 1970  
Spouse: Mary Anne

Barnard, Jr, John  
Emeritus Member  
4301 Madison Ave, Apt 303  
Kansas City, MO 64111-3493  
Member since: 1966  
Spouse: Mary

Bal, Sonny  
Regular Member  
1100 Virginia Avenue  
Columbia, MO 65212-0001  
Phone: 573-882-6762  
Fax: 573 882-8200  
E-mail: balb@health.missouri.edu  
Member since: 2006  
Spouse: Dana

Bankoff, David  
Regular Member  
53880 Carmichael Drive  
South Bend, IN 46635-1567  
Phone: 574-247-9441  
Fax: 574-247-9442  
Member since: 1985  
Spouse: Billie

Berkebile, Dale  
Emeritus Member  
1717 West Blvd.  
Rapid City, SD 57701  
Fax: 605 343-4026  
Member since: 1982  
Spouse: Mary
Bostick, Robert
Regular Member
Jefferson Orthopedic Clinic
920 Avenue B
Marrero, LA 70072
Phone: 504-349-6804
E-mail: rdbostick@cox.net
Member since: 2010
Spouse: Gwen Bostick

Booze, James
Emeritus Member
Fort Harrison VA Hospital
724 Monroe St.
Helena, MT 59601
Fax: 406-442-6410
Member since: 1988
Spouse: Mary Beth

Blair, Jr., William
Regular Member
1981 South Old Temple Road
Lorena, TX 76655
Phone: 254-399-6662
Fax: 254-399-6682
E-mail: billblairmd@msn.com
Member since: 1987
Spouse: Elizabeth Ann

Bloss, Bryant
Emeritus Member
4770 Covert Ave, Ste 104
Evansville, IN 47714
Phone: 812 479-8571
Fax: 812 474-6239
E-mail: blossortho@evansville.net
Member since: 1976
Spouse: Bette

Bonutti, Peter
Regular Member
1303 W Evergreen
Effingham, IL 62401
Phone: 217-342-3400
Fax: 217-342-6416
E-mail: p@bonutti.net
Member since: 2005
Spouse: Simone

Berry, Daniel
Regular Member
Mayo Clinic
200 First St SW
Rochester, MN 55905-0001
Phone: 507-284-4204
Fax: 507-266-4234
E-mail: berry.daniel@mayo.edu
Member since: 2001
Spouse: Camilla

Berry, Sidney
Emeritus Member
446 Saint Andrews Dr
Jackson, MS 55905
Fax: 601-933-1996
Member since: 1989
Spouse: Betsy

Bishop, Don
Emeritus Member
Fort Harrison VA Hospital
724 Monroe St.
Helena, MT 59601
Fax: 406-442-6410
Member since: 1981
Spouse: Joan

Berry, Daniel
Brown, David
Emeritus Member
6303 N Portland, Suite 304
Oklahoma City, OK 73112
Phone: 405-840-4920
Fax: 405-840-4920
E-mail: drbokc@earthlink.net
Member since: 1973
Spouse: Ann

Brahms, Malcolm
Emeritus Member
3755 Orange PL
Beachwood, OH 44122
Fax: 216-831-5320
Member since: 1971
Spouse: Evelyn

Brackett, III, E. Boone
Regular Member
Westgate Orthopaedics Ltd
1125 Westgate
Oak Park, IL 60301
Phone: 708-848-7700
Fax: 708-848-9375
E-mail: Boone8921@sbcglobal.net
Member since: 1977
Spouse: Andrea Brackett

Brackett, Bess
Regular Member
44 Walker Road
Berlin, VT 05602-8960
Phone: 802-728-2455
Fax: 802-728-2650
E-mail: drbess@comcast.net
Member since: 1998
Spouse: James Currie, MD

Brackett, Dennis
Emeritus Member
3468 Courtland Rd.
Pepper Pike, OH 44122-4280
Phone: 216 765-0225
Fax: 216-595-5382
E-mail: 336647@sbcglobal.net
Member since: 1976
Spouse: Laura

Brooks, Arthur
Emeritus Member
1215 S. Harpeth Road
Kingston Springs, TN 37082
Member since: 1964

Brooks, Dennis
Emeritus Member
3468 Courtland Rd.
Pepper Pike, OH 44122-4280
Phone: 216 765-0225
Fax: 216-595-5382
E-mail: 336647@sbcglobal.net
Member since: 1976
Spouse: Laura

Brooks, Ann
Emeritus Member
20300 Highland Rd.
Cleveland, OH 44128
Phone: 216-765-0225
Fax: 216-595-5382
E-mail: 336647@sbcglobal.net
Member since: 1976
Spouse: Dennis

Bowman, Michael
Regular Member
20130 Rt 19 Ste. 1100
Cranberry Twp, PA 16066
Fax: 724-933-3300
Member since: 2002
Spouse: Beth

Boston, Jr., H. Chester
Regular Member
305 Bryant Drive East
PO Box 2447
Tuscaloosa, AL 35403
Phone: 205-345-0192
Fax: 205-345-3371
E-mail: cboston@univorthoclinic.com
Member since: 1983
Spouse: Paula
Bussey, Kenneth
Regular Member
1809 Gunbarrel Rd., Ste 101
Chattanooga, TN 37421
Phone: 423-893-9040
Fax: 423-893-9040
E-mail: cbjs1@comcast.net
Member since: 2003
Spouse: Susan

Brueckmann, F. Robert
Emeritus Member
3302 S. 975 E
Zionsville, IN 46077-8915
E-mail: rbrueckmann@indy.rr.com
Member since: 1969
Spouse: Betty Lee

Brown, Douglas
Regular Member
312 Grammont Street, Ste 302
Monroe, LA 71201
Phone: 318-323-6603
Fax: 318-387-3601
E-mail: dcbrownmd@aol.com
Member since: 1978
Spouse: Caroline

Brueckmann, F. Robert
Emeritus Member
3302 S. 975 E
Zionsville, IN 46077-8915
E-mail: rbrueckmann@indy.rr.com
Member since: 1969
Spouse: Betty Lee

Bruce, W. David
Regular Member
1809 Gunbarrel Rd., Ste 101
Chattanooga, TN 37421
Phone: 423-893-9040
Fax: 423-893-9040
E-mail: cbjs1@comcast.net
Member since: 2003
Spouse: Susan

Bussey, Kenneth
Regular Member
834 N. Seminary St Ste 102
Galesburg, IL 61401
Fax: 309-342-9759
E-mail: cbussey@centurytel.net
Member since: 1989
Spouse: Karren

Brown, Treg
Regular Member
110 Sunrise Trail
Carbondale, IL 62902
Phone: 618-559-3267
E-mail: tbrown@sioc.com
Member since: 2010
Spouse: Greyson Brown

Burnham, Wesley
Emeritus Member
PO Box 514
Minneapolis, MN 55480-0514
Member since: 1950
Spouse: Esther

Brown, Tommy
Regular Member
2707 Citico Ave
Chattanooga, TN 37406
Fax: 423-622-3069
E-mail: dbrown@chattsportsmed.com
Member since: 2005
Spouse: Greyson Brown

Bubb, Stephen
Emeritus Member
17 Water Island
St Thomas, VI 00802-7801
Phone: 340-244-7881
Fax: 816 926-0506
E-mail: true-north@email.msn.com
Member since: 1981
Spouse: Susan
Cary, Jr., George R.
Emeritus Member
3434 Prytania St., Suite 450
New Orleans, LA 70115
Fax: 504-899-4933
Member since: 1979
Spouse: Elizabeth

Canale, S. Terry
Regular Member
1400 South Germantown Road
Germantown, TN 38138
Phone: 901-759-3126
Fax: 901-759-3195
E-mail: stcanale@campbellclinic.com
Member since: 2001
Spouse: Martha

Carothers, Thomas
Regular Member
2526 Handasyde Court
Cincinnati, OH 45208-2720
Phone: 513-791-6611
Fax: 513-791-6778
E-mail: tcarothers@cinci.rr.com
Member since: 1989
Spouse: Annette

Cain, E. Lyle
Regular Member
805 St. Vincent’s Drive
Ste 100
Birmingham, AL 35205
Phone: 205-939-3699
Fax: 205-314-2568
E-mail: lylecain@aol.com
Member since: 2001
Spouse: Jill

Campbell, Dwight
Regular Member
7785 North State St.
Ste 120
Lowville, NY 13367
Phone: 315-376-5163
E-mail: dcampbell@pcgh.net
Member since: 2010
Spouse: Jean Campbell

Campbell, Jr., Robert
Regular Member
Children’s Hspt Philadelphia
Wood Building, 2nd Floor
3400 N. 2nd St.
Philadelphia, PA 19140-4602
Phone: 215-590-1527
Fax: 267-426-5475
E-mail: campbellrm@email.chop.edu
Member since: 1993
Spouse: Corey Duong

Campbell, Dwight
Regular Member
805 St. Vincent’s Drive
Ste 100
Birmingham, AL 35205
Phone: 205-939-3699
Fax: 205-314-2568
E-mail: lylecain@aol.com
Member since: 2001
Spouse: Jill

Carothers, Charles O.
Emeritus Member
2737 Walsh Place
Cincinnati, OH 45208
Fax: 513-871-8449
Member since: 1962
Spouse: Twink

Canale, S. Terry
Regular Member
1400 South Germantown Road
Germantown, TN 38138
Phone: 901-759-3126
Fax: 901-759-3195
E-mail: stcanale@campbellclinic.com
Member since: 2001
Spouse: Martha

Carothers, Thomas
Regular Member
2526 Handasyde Court
Cincinnati, OH 45208-2720
Phone: 513-791-6611
Fax: 513-791-6778
E-mail: tcarothers@cinci.rr.com
Member since: 1989
Spouse: Annette

Cary, Jr., George R.
Emeritus Member
3434 Prytania St., Suite 450
New Orleans, LA 70115
Fax: 504-899-4933
Member since: 1979
Spouse: Elizabeth

Carlton, Robert
Emeritus Member
2939 Chelton Road
Colorado Springs, CO 80909
Fax: 719-635-2855
Member since: 1967
Spouse: Barbara

Carothers, Charles O.
Emeritus Member
2737 Walsh Place
Cincinnati, OH 45208
Fax: 513-871-8449
Member since: 1962
Spouse: Twink

Carlton, Robert
Emeritus Member
2939 Chelton Road
Colorado Springs, CO 80909
Fax: 719-635-2855
Member since: 1967
Spouse: Barbara
Clayburgh, Robert H.
Regular Member
Valley Bone & Joint Clinic
3035 Demers Avenue
Grand Forks, ND 58201
Phone: 701 738-0790
Fax: 701-795-2553
E-mail: clayburgh@valleyboneandjoint.com
Member since: 1989
Spouse: Sally

Chow, James C.
Emeritus Member
Orthopaedic Center of Southern
4121 Veterans Memorial Drive
Mount Vernon, IL 62864
Fax: 618-242-9717
E-mail: ocsjic@charter.net
Member since: 1991
Spouse: Ada

Castle, Maurice E.
Emeritus Member
19966 Old Pond Ct.
Franklin, MI 48025
Member since: 1967
Spouse: Helen

Chow, James C.
Emeritus Member
Orthopaedic Center of Southern
4121 Veterans Memorial Drive
Mount Vernon, IL 62864
Fax: 618-242-9717
E-mail: ocsjic@charter.net
Member since: 1991
Spouse: Ada

Clarke, Michael
Emeritus Member
6725 East Farm Road 138
Springfield, MO 65802
Phone: 417-881-5529
Fax: 417-885-3921
E-mail: mscdr@sbcglobal.net
Member since: 1982
Spouse: Krystyna K. Clarke RN

Chandrasekharan, Rama
Regular Member
1210 East Eighth Street, Ste 1
Weslaco, TX 78596
Fax: 956-969-1761
E-mail: docchandra@aol.com
Member since: 1999
Spouse: Mae P. Chandra

Cashio, L. Thomas
Regular Member
66 Yellowstone Dr.
New Orleans, LA 70131
Phone: 504-392-8983
E-mail: ltcashio@cox.net
Member since: 2012

Chang, Paul
Regular Member
11 Hood Circle
Boxford, MA 01921-2457
Phone: 210-296-5244
Fax: 210 567-0893
Member since: 2005
Spouse: Mary Chang

Clayburgh, Bennie
Emeritus Member
1626 Belmont Road
Grand Forks, ND 58201
E-mail: benclayburgh@undalumni.org
Member since: 1964
Spouse: Beverly

Clayburgh, Robert H.
Regular Member
Valley Bone & Joint Clinic
3035 Demers Avenue
Grand Forks, ND 58201
Phone: 701 738-0790
Fax: 701-795-2553
E-mail: clayburgh@valleyboneandjoint.com
Member since: 1989
Spouse: Sally
Clayton, Robert
Regular Member
13450 North Meridian Street
Carmel, IN 46032
Fax: 317-575-2713
Member since: 1989
Spouse: Diane

Collie, Jr., Lamar P.
Emeritus Member
24165 W Interstate 10, Ste 217
San Antonio, TX 78257-1160
Member since: 1970
Spouse: Lexie

Cletcher, Jr., John O.
Emeritus Member
Front Range Orthopaedics
1551 Professional Ln #200
Longmont, CO 80501-6963
Fax: 303-772-5303
E-mail: docjoc@juno.com
Member since: 1992

Collumpy, Michael
Emeritus Member
16505 Shoreline Drive
Brookfield, WI 53005
Phone: 414-643-8800
Fax: 414-643-6600
E-mail: mcollopy@wi.rr.com
Member since: 1977
Spouse: Shelia

Coleman, Carl
Emeritus Member
10230 Ashton Close
Powell, OH 43065
Fax: 614-885-6653
E-mail: carlrcoleman@columbus.rr.com
Member since: 1965
Spouse: Judith

Colme, Thomas
Emeritus Member
560 Park Ave
River Forest, IL 60305
E-mail: eljaccc@hotmail.com
Spouse: Lynette

Coleman, Thomas P.
Emeritus Member
513 Maple Dell Road
Cambridge, MN 55008
Member since: 1977
Spouse: Elaine

Cooper, Douglas M.
Regular Member
1722 Country Club Lane
Marshalltown, IA 50158
Phone: 641-752-7191
Fax: 641-752-2781
E-mail: coope@mchsi.com
Member since: 2000
Spouse: Margaret Fehrle, MD
Cooper, Jr., Hugh E.
Emeritus Member
6300 School St Apt 309
Windsor Heights, IA 50311
E-mail: hec325@msn.com
Member since: 1965
Spouse: Beryl

Craig, Jr., James T.
Emeritus Member
11 Okeena Drive
Jackson, TN 38305
Phone: 731-660-8351
Fax: 731-660-8375
E-mail: crai2990@bellsouth.net
Member since: 1986
Spouse: Patricia

Corban, Magruder S.
Emeritus Member
PO Box 1430
Long Beach, MS 39560
Phone: 228-864-4352
Fax: 228-864-4352
E-mail: magruderscor@cableone.net
Member since: 1975
Spouse: Peggy

Damschroder, Allen D.
Emeritus Member
7737 Indian Garden Rd.
Petoskey, MI 49770
E-mail: aljaned@chartermi.net
Member since: 1975
Spouse: Jane

Cotton, Ralph L.
Emeritus Member
130 Vine Street
Denver, CO 80206
Member since: 1967
Spouse: Nancy

Dangles, Chris
Regular Member
1107 W University Ave
Champaign, IL 61821
Phone: 217-383-3260
Fax: 217-383-4459
E-mail: cdanglesmd@comcast.net
Member since: 1988
Spouse: Donna deCamara M.D.

Couden, Trevert L.
Emeritus Member
204 Tigitsi Place
Louden, TN 37774
Member since: 1975
Spouse: Karen

Daugherty, Jr., M. Preston
Regular Member
3610 Springhill Memorial Dr N
Mobile, AL 36608-1162
Fax: 251-380-1157
E-mail: daugherty6041@bellsouth.net
Member since: 1985
Spouse: Amelia
Davidson, Vanda L.  
Regular Member  
211 N 3rd St Ste A  
Alexandria, LA 71301  
Phone: 318 443-4514  
Fax: 318 443-6567  
Member since: 1993  
Spouse: Carrie Sue

DeFiore, Jr., Joseph  
Emeritus Member  
3774 Edgewater Way  
Louisville, TN 37777-3786  
Phone: 665 558-4412  
Fax: 315-558-4421  
E-mail: defiore@aol.com  
Member since: 1981  
Spouse: Jayne

Davidson, Jr., Randall L.  
Regular Member  
Ste 200  
1050 N James Campbell Blvd  
Columbia, TN 38401-2754  
Fax: 931380-0513  
E-mail: rdavidson8@hotmail.com  
Member since: 2004  
Spouse: Jeannie

DeFreest, Lynn J.  
Emeritus Member  
6000 Pelican Bay Blvd., #C1103  
Naples, FL 34108  
Member since: 1979  
Spouse: Patricia

Davino, Nelson A.  
Regular Member  
1517 Thompson Rd  
Richmond, TX 77469  
Fax: 281344-1716  
E-mail: ndavino@rbjc.com  
Member since: 1998  
Spouse: Karen

Deinlein, Donald A.  
Regular Member  
FOT 901  
510 20th St South  
Birmingham, AL 35294-0001  
Phone: 205-975-0472  
Fax: 205-975-4701  
Member since: 1998  
Spouse: Phyllis

Davis, John A  
Regular Member  
Tulane University  
1430 Tulane Ave. SL32  
New Orleans, LA 70112  
Phone: 504-988-3515  
Fax: 504-988-3517  
E-mail: jdadvis7@tulane.edu  
Member since: 2007  
Spouse: Vicki Davis

Denker, Merle J.  
Emeritus Member  
2525 Kaneville Road  
Geneva, IL 60134-2578  
Phone: 630-584-1733  
Fax: 630-584-1733  
Member since: 1993  
Spouse: Gail
DePersio, Kenneth P.
Regular Member
2201 Indian Trail
Douglas, GA 31533
Phone: 912-384-9682
E-mail: kdpmd@hotmail.com
Member since: 1989
Spouse: Colleen

Dorris III, John R
Regular Member
3351 Masonic Dr
Alexandria, LA 71301
Phone: 318-441-8334
Fax: 318-441-8363
E-mail: mardod@aol.com
Member since: 2002
Spouse: Toya

Devlin, Terrance
Regular Member
8611 Patience Lane
Lafayette, IN 47905
Phone: 765-296-7378
E-mail: tdevlin@witham.org
Member since: 2012
Spouse: Michelle

Donahoe, David K
Regular Member
354 Ridgelawn Dr. W
Mobile, AL 36608
Phone: 251-380-0880
E-mail: dkdonahoe@yahoo.com
Member since: 2010
Spouse: Laurie Donahoe

DiFilippo, Emil A.
Regular Member
1877 Spring Mill Creek
St. Charles, MO 63303
Phone: 636-561-5037
Fax: 636 946-3368
E-mail: emil.d@sbcglobal.net
Member since: 1993
Spouse: Rebecca

Dorris, Emil A.
Regular Member
1877 Spring Mill Creek
St. Charles, MO 63303
Phone: 636-561-5037
Fax: 636 946-3368
E-mail: emil.d@sbcglobal.net
Member since: 1993
Spouse: Rebecca

Do, Pat
Regular Member
1923 North Webb Road
Wichita, KS 67206
Phone: 316-262-4886
E-mail: pdo@midamortho.com
Member since: 2006
Spouse: Sylvia

Duck, Holly J.
Regular Member
340 S. Whitney Way
Madison, WI 53705
Phone: 608-238-9311
Fax: 608-238-8810
E-mail: onequack@sbcglobal.net
Member since: 2010
Edmonson, Allen S.
Emeritus Member
Campbell Clinic
1211 Union Ave # 500
Memphis, TN 38104-6656
Fax: 901-448-5880
Member since: 1971
Spouse: Joanne

Easley, Mark Erik
Regular Member
Duke Health Center
3116 N Duke St Rm 243
Durham, NC 27704
Phone: 919-660-2266
Fax: 919-668-6475
E-mail: easle004@mc.duke.edu
Member since: 2004
Spouse: Mary

Edholm, Curtis D.
Emeritus Member
1421 Woodcliff Drive, S.E.
Grand Rapids, MI 49506
E-mail: leecur@aol.com
Member since: 1973
Spouse: Lois

Eckhoff, Donald G.
Emeritus Member
2021 Bellaire
Denver, CO 80207
Fax: 720-848-2157
Member since: 1993
Spouse: Lois

Dunitz, Norman
Emeritus Member
4722 South Yorktown Place
Tulsa, OK 74105
Phone: 918-392-1522
Fax: 918-743-0324
E-mail: ndunitz@aol.com
Member since: 1975
Spouse: Annette

Durbin, Robert A.
Regular Member
170 Taylor Station Rd
Columbus, OH 43213
Phone: 614-545-7900
Fax: 614-545-7901
Member since: 1986
Spouse: Sue

Edholm, Curtis D.
Emeritus Member
1421 Woodcliff Drive, S.E.
Grand Rapids, MI 49506
E-mail: leecur@aol.com
Member since: 1973

Dyer, Jr., W. Carl
Regular Member
2339 McCallie Ave., Ste 402
Chattanooga, TN 37404
Phone: 423-266-1800
Fax: 423-266-1800
E-mail: wcdyer@msn.com
Member since: 1991
Spouse: Mable

Edmonson, Allen S.
Emeritus Member
Campbell Clinic
1211 Union Ave # 500
Memphis, TN 38104-6656
Fax: 901-448-5880
Member since: 1971
Spouse: Joanne
Flatley, Thomas
Emeritus Member
Dept. of Orthopaedics
9200 West Wisconsin Avenue
Milwaukee, WI 53226-0099
Phone: 414-805-7499
Fax: 414-805-7424
Member since: 1978
Spouse: Neva

Eyler, Don L.
Emeritus Member
806 Judson Bullock Rd.
Warm Springs, GA 31830
Member since: 1957
Spouse: Kathy

Eichler, Elwood J.
Emeritus Member
4633 Far West Blvd, #4
Austin, TX 78731
Fax: 524-771-1148
Member since: 1967
Spouse: Sue

Faust, Donald
Regular Member
2633 Napoleon Ave Ste 600
New Orleans, LA 70115
Phone: 504-899-1000
Fax: 504-899-4980
E-mail: dfaustmd@yahoo.com
Member since: 1991
Spouse: Mary Kay

Eisele, Sandra A.
Regular Member
5105 Ivyfarm Road
Cincinnati, OH 45243
Phone: 513-271-3222
Fax: 513-271-3135
E-mail: s.eisele@att.net
Member since: 1993
Spouse: Thomas

Fitzgibbons, Timothy C.
Regular Member
17030 Lakeside Hills Plz, #200
Omaha, NE 68130
Phone: 402-361-5205
Fax: 402-361-5272
E-mail: drfitz@gikk.com
Member since: 1985
Spouse: Therese

Ellsasser, James C.
Emeritus Member
13700 Highway 40 West
Rocheport, MO 65279
E-mail: bigchiefdog@msn.com
Member since: 1976
Froimson, Avrum I.
Emeritus Member
2529 Crestwood Rd
Marrero, LA 70072
Phone: 504 348-4078
E-mail: froimsa@ccf.org
Member since: 1969
Spouse: Phyllis

Froehling, Alan L.
Regular Member
302 Broadway St.
Mount Vernon, IL 62864-5116
Phone: 618-242-4750
Fax: 618-242-7674
E-mail: alfmd@mvn.net
Member since: 1993
Spouse: Barbara

Froehling, Charles Jr.
Regular Member
2119 E South Blvd #200
Montgomery, AL 36116
Phone: 334-613-9000
Fax: 334-286-6311
E-mail: docfletch71@aol.com
Member since: 1991
Spouse: Deborah L. Russell

Friedman, Barry A.
Emeritus Member
8515 Costa Verde Blvd #906
San Diego, CA 92122-1142
Phone: 858 622-1297
Member since: 1956
Spouse: Susan

Fleming, Jr., Robert A.
Emeritus Member
2529 Crestwood Rd
Marrero, LA 70072
Phone: 504 348-4078
E-mail: raf1966@aol.com
Member since: 1981

Freiberg, Richard A.
Emeritus Member
779 Windings Lane
Cincinnati, OH 45220
E-mail: raf@cinci.rr.com
Member since: 1971
Spouse: Adrianne

Freiberg, Per
Regular Member
SIU SOM
PO Box 19679
Springfield, IL 62794
Phone: 217 545-7746
E-mail: pfreitag@siumed.edu
Member since: 2012

Fox, Kermit
Emeritus Member
1034 Liberty Park Dr, Apt 241R
Austin, TX 78746
Member since: 1953
Spouse: Jewel

Fletcher, Jr., Charles
Regular Member
2119 E South Blvd #200
Montgomery, AL 36116
Phone: 334-613-9000
Fax: 334-286-6311
E-mail: docfletch71@aol.com
Member since: 1991
Spouse: Deborah L. Russell

Froimson, Avrum I.
Emeritus Member
19300 Shelburne Rd.
Shaker Heights, OH 44118
E-mail: froimsa@ccf.org
Member since: 1969
Spouse: Phyllis
Furry, Dean L.  
Emeritus Member  
PO Box 1307  
Durango, CO 81302  
Phone: 970-247-4276  
Fax: 970-759-6045  
E-mail: dfurry@q.com  
Member since: 1976  
Spouse: Nancy

Furry, Kim  
Regular Member  
1 Mercado St. Ste 202  
Durango, CO 81301  
E-mail: klf@dgoortho.org  
Member since: 2010  
Spouse: Mike Sigman

Galante, Jorge O.  
Emeritus Member  
Rush Arthritis & Ortho Inst.  
1725 W. Harrison St. Rm 1055  
Chicago, IL 60612  
Fax: 312-243-7707  
Member since: 1972  
Spouse: Sofija

Garber, John E.  
Regular Member  
Witham Orthopaedic Associates  
2705 N. Lebanon Street  
North Pavilion, Ste 210  
Lebanon, IN 46052  
Phone: 765-485-8790  
Fax: 765-485-8795  
E-mail: john_garber_56@comcast.net  
Member since: 1988  
Spouse: Anne

Garner, Jr., James H.  
Emeritus Member  
3524 West 92nd Terrace  
Leawood, KS 66206-1736  
Fax: 816-941-3835  
Member since: 1975  
Spouse: Carol

Geline, Richard Allen  
Emeritus Member  
1225 Central Road  
Glenview, IL 60025  
Fax: 847-729-9089  
E-mail: rgeline@sbcglobal.net  
Member since: 2000  
Spouse: Patricia

Gilligan, William J.  
Emeritus Member  
550 W. Ogden Avenue  
Hinsdale, IL 60521  
Fax: 630-323-6958  
Member since: 1998  
Spouse: Jayne

Gislason, Paul H.  
Emeritus Member  
Apt 314  
5919 Centerville Road  
Saint Paul, MN 55127-6831  
Phone: 507 388-3113  
Member since: 1974  
Spouse: Marian
Green, Milton M.
Emeritus Member
4920 Lagoons Circle
W. Bloomfield, MI 48323
Fax: 248-681-7796
E-mail: orthopod@aol.com
Member since: 1977
Spouse: Sally

Granberry, W. Malcolm
Emeritus Member
3610 Springhill Memorial Dr N
Mobile, AL 36608
Phone: 251-410-3600
E-mail: mlg@alortho.com
Member since: 1993
Spouse: Margaret

Green, Milton M.
Emeritus Member
4920 Lagoons Circle
W. Bloomfield, MI 48323
Fax: 248-681-7796
E-mail: orthopod@aol.com
Member since: 1977
Spouse: Sally

Glessner, Jr., James
Emeritus Member
5089 S. Quail Crest S.E.
Grand Rapids, MI 49546
Member since: 1965
Spouse: Winnie

Granberry, Michael L.
Regular Member
3610 Springhill Memorial Dr N
Mobile, AL 36608
Phone: 251-410-3600
E-mail: mlg@alortho.com
Member since: 1993
Spouse: Sheri

Glessner, Jr., James
Emeritus Member
5089 S. Quail Crest S.E.
Grand Rapids, MI 49546
Member since: 1965
Spouse: Winnie

Gore, Donald R.
Emeritus Member
Sheboygan Orthopaedic Associat
2920 Superior Avenue
Sheboygan, WI 53081
Fax: 920-458-3783
E-mail: dgor@physhealthnet.com
Member since: 1975
Spouse: Jacquelyn

Gore, Donald R.
Emeritus Member
Sheboygan Orthopaedic Associat
2920 Superior Avenue
Sheboygan, WI 53081
Fax: 920-458-3783
E-mail: dgor@physhealthnet.com
Member since: 1975
Spouse: Jacquelyn

Gould, John S.
Regular Member
1313 13th St. South
Birmingham, AL 35205
Phone: 205-930-7708
Fax: 205-930-8530
E-mail: gouldjs@aol.com
Member since: 1978
Spouse: Sheryl H. Gould

Gould, John S.
Regular Member
1313 13th St. South
Birmingham, AL 35205
Phone: 205-930-7708
Fax: 205-930-8530
E-mail: gouldjs@aol.com
Member since: 1978
Spouse: Sheryl H. Gould

Gottesman, Martin J.
Regular Member
931 Chatham Lane Ste. 101
Columbus, OH 43221
Fax: 614-451-2197
E-mail: orthopod@columbus.rr.com
Member since: 1987
Spouse: Jenny

Granberry, W. Malcolm
Emeritus Member
1758 Rice Blvd.
Houston, TX 77005
Fax: 713-790-7500
E-mail: wmalcolm@gmail.com
Member since: 1974
Spouse: Margaret

Granberry, W. Malcolm
Emeritus Member
1758 Rice Blvd.
Houston, TX 77005
Fax: 713-790-7500
E-mail: wmalcolm@gmail.com
Member since: 1974
Spouse: Margaret
Greene, Jr., Perry W.
Emeritus Member
2750 Bonnell SE
Grand Rapids, MI 49506
Fax: 616-942-7708
E-mail: perrygreene@msn.com
Member since: 1980
Spouse: Janet

Grunsten, Russell C.
Emeritus Member
7 Indian River Ave
#307
Titusville, FL 32796
Member since: 1975
Spouse: Marian

Griffin, James
Regular Member
3116 S. Birmingham Ave
Tulsa, OK 74146
Phone: 918-392-1400
Fax: 918-392-1401
E-mail: jgriffinT28@cox.net
Member since: 1987
Spouse: Anna

Gustilo, Ramon B.
Emeritus Member
825 South Eighth Street, #550
Minneapolis, MN 55404
Phone: 612-337-0620
Fax: 612-337-0620
E-mail: hckbarth@mcw.edu
Member since: 1977
Spouse: Gloria

Grinblat, Enrique
Emeritus Member
1130 New Trier Ct
Wilmette, IL 60091-1033
Fax: 847-677-0231
Member since: 1991
Spouse: Fanny

Hackbarth, Jr., Donald A.
Regular Member
Medical College of Wisconsin
Dept. of Orthopaedic Surgery
9200 W. Wisconsin Ave.
Milwaukee, WI 53226-0099
Phone: 414-805-7424
Fax: 414-805-7499
E-mail: hckbarth@mcw.edu
Member since: 1987
Spouse: Sandra

Gross, Worth
Emeritus Member
5812 S. Delaware Ave.
Tulsa, OK 74105
Phone: 918 742-1159
Member since: 1970
Spouse: Charlotte

Hamilton, James J.
Regular Member
8736 Cherokee Court
Leawood, KS 66206
Phone: 816-404-5404
Fax: 816-404-5381
E-mail: james.hamilton@tmcmed.org
Member since: 1988
Spouse: Linda
Heidt, Jr., Robert S.
Emeritus Member
7663 Five Mile Rd
Cincinnati, OH 45230
Phone: 513-232-6677
Fax: 513-624-4113
E-mail: kferguson@wellingtonortho.com
Member since: 1988
Spouse: Julie

Hayes, James
Emeritus Member
1845 East Purple Martin Lane
Green Valley, AZ 85614
Phone: 520-777-8328
Fax: 520-777-8328
E-mail: Sjzoo@cox.net
Member since: 1990
Spouse: Sharon

Hartman, J. Ted
Emeritus Member
4018 16th Street
Lubbock, TX 79416
Phone: 806-795-3798
Fax: 806-795-3798
E-mail: jth@nts-online.net
Member since: 1965
Spouse: Jean

Heidt, Jr., Robert S.
Regular Member
7663 Five Mile Rd
Cincinnati, OH 45230
Phone: 513-232-6677
Fax: 513-624-4113
E-mail: kferguson@wellingtonortho.com
Member since: 1988
Spouse: Julie
Hejna, William F.
Emeritus Member
77 E Burlington Street
Riverside, IL 60546-2124
Fax: 708-447-4676
E-mail: wfhejna@comcast.net
Member since: 1969
Spouse: Eva

Henry, Jack
Emeritus Member
3601 4th St
STOP 9436
Lubbock, TX 79430-0001
Phone: 806 743-2465
Fax: 806 743-1305
E-mail: alicia.niemeyer@ttuhsc.edu
Member since: 1993
Spouse: Jane

Heller, Mark A.
Regular Member
Twin Cities Orthopaedics
701 25th Ave S #505
Minneapolis, MN 55454
Fax: 612-455-2045
E-mail: markheller@tcomm.com
Member since: 2004
Spouse: Anna Marie

Herman, Sr., Daniel
Emeritus Member
1019 Bayou Street
Vincennes, IN 47591
Phone: 812-882-6972
Fax: 812-885-2371
Member since: 1986
Spouse: Mary

Helper, Stephen D.
Regular Member
29001 Cedar Road, Ste 519
Lyndhurst, OH 44124
Phone: 440 449-6291
Fax: 440 449-6948
Member since: 1992
Spouse: Barbara George

Hester, Roland A.
Regular Member
2119 E. South Blvd. Ste. 200
Montgomery, AL 36226
Phone: 334-619-9000
Member since: 2011

Henke, John A.
Emeritus Member
Ann Arbor Orthopaedic Surgery
5315 Elliott Drive, Ste 304
Ypsilanti, MI 48197
Fax: 712-734-0607
E-mail: jhenke05@comcast.net
Member since: 1991
Spouse: Donna

Higley, Jr., George B.
Emeritus Member
1143 Cordova Club Drive
Cordova, TN 38018-2819
Member since: 1976
Spouse: Patricia
Huber, David F.
Emeritus Member
170 Taylor Station Road
Columbus, OH 43213
Phone: 614-545-7900
Fax: 614-545-7901
Member since: 1990
Spouse: Mary R.

Holt, Richard T.
Regular Member
210 East Gray, Ste 601
Louisville, KY 40202
Phone: 502 585-2300
Fax: 502 584-2726
E-mail: holt@spine-surgery.org
Member since: 1985
Spouse: Sue

Hoekman, Ronald
Emeritus Member
10369 Lakeshore Ave
West Olive, MI 49660
Phone: 616-450-0144
Fax: 616-847-8346
E-mail: rhoekman@charter.net
Member since: 1983
Spouse: Pat

Hood, L. Thomas
Emeritus Member
6022 Country Club Oaks
Omaha, NE 68152
Member since: 1964

Hodurski, Donald F.
Emeritus Member
P O Box 250450
Montgomery, AL 36125-0450
Fax: 334-286-6311
Member since: 1990
Spouse: Mary Ellen

Hubbard, Charles N.
Regular Member
Carrollton Orthopaedic Clinic
150 Clinic Ave. Ste 101
Carrollton, GA 30117
Phone: 770-834-0873
Fax: 770-834-6118
E-mail: cnhmd@bellsouth.net
Member since: 2001
Spouse: Marilyn

Holm, John H.
Emeritus Member
1637 2nd Ave.
Columbus, OH 43215
Phone: 614-464-1515
Fax: 614-464-1516
E-mail: john@hohns.com
Member since: 1988
Spouse: Carol

Hofmann, Dabney
Regular Member
1103 16th Ave. SE
Decatur, AL 35601
Phone: 256-350-0362
Fax: 256-340-4415
E-mail: scout776@aol.com
Member since: 1993
Spouse: Leslie

Hubbard, Ronald E.
Regular Member
2000 Park Place
Savannah, GA 31401
Phone: 912-233-1234
Fax: 912-233-1235
E-mail: hohme@spine-surgery.org
Member since: 1967
Spouse: Jane

Holmes, Henry M.
Emeritus Member
1700 Riverwoods Dr #519
Melrose Park, IL 60160
E-mail: hankholmes15@comcast.net
Member since: 1989
Spouse: Judith

Huber, David F.
Regular Member
170 Taylor Station Road
Columbus, OH 43213
Phone: 614-545-7900
Fax: 614-545-7901
Member since: 1990
Spouse: Gail R.
Jeffries, G. Edward
Emeritus Member
1932 Alcoa Hwy #360
Knoxville, TN 37920
Phone: 865-546-2663
Fax: 865-546-4421
Member since: 2001
Spouse: Celle

Hurwitz, Shepard R.
Regular Member
400 Silver Cedar Ct
Chapel Hill, NC 27514
Phone: 919-929-7103
Fax: 919-942-8899
E-mail: shurwitz@abos.org
Member since: 2011

Irwin, Peter
Emeritus Member
4015 Free Ferry Road
Fort Smith, AR 72903-1800
Member since: 1993
Spouse: Kathryn

Hudgens, Russell A.
Regular Member
3610 Springhill Memorial Dr, N
Mobile, AL 36608-1162
Phone: 251-410-3600
Fax: 251-410-3744
E-mail: rhudgensmd@comcast.net
Member since: 1996
Spouse: Celle

Huff, James M.
Emeritus Member
40 Settler Hill Circle
Madison, WI 53717
Member since: 1973
Spouse: Leonette

Ihle, Peter M.
Emeritus Member
4002 Forest Heights Drive
Eau Claire, WI 54701
E-mail: pmimdfacs@hotmail.com
Member since: 1982
Spouse: Nancy

Hunter, A. Lee
Regular Member
Ste. 200
1050 N James Campbell Blvd
Columbia, TN 38401-2754
Phone: 931-388-4276
Fax: 931-380-0513
E-mail: elaine@mtbj.net
Member since: 2006
Spouse: Mary

Hudgens, Wiley C.
Emeritus Member
1712 Bramblewood Drive
Columbus, MS 39701
Member since: 1977

Jeffries, G. Edward
Emeritus Member
1932 Alcoa Hwy #360
Knoxville, TN 37920
Phone: 865-546-2663
Fax: 865-546-4421
Member since: 2001
Jones, David T.
Regular Member
3410 Executive Dr.
Raleigh, NC 27609
Phone: 919-872-5296
Fax: 919-850-9718
E-mail: sportsmedmd@hotmail.com
Member since: 2010
Spouse: Shawna Jones

Johnson, Lanny L.
Emeritus Member
PO Box 2220
Frankfort, MI 49635
E-mail: ljmd@aol.com
Member since: 1988
Spouse: Carol

Jolly, Susan
Regular Member
9351 Grant St #360
Thornton, CO 80229
Phone: 303-423-2000
Fax: 303-430-6420
E-mail: susandyer1@mac.com
Member since: 1993
Spouse: Kent Dyer

Johansen, R. Lance
Regular Member
15190 Community Road
Suite 120
Gulfport, MS 39503
Phone: 228-328-2400
Fax: 228-328-4200
E-mail: pasmith@msortho.net
Member since: 2009
Spouse: Shawna Jones
Jones, Jr., Lowry  
Regular Member  
Kansas City Orthopaedic Instit  
3651 College Blvd  
Leawood, KS 66211  
Fax: 913-319-7664  
E-mail: ljones@kcoi.com  
Member since: 1998  
Spouse: Kristy

Kahn, Ill, Alfred  
Regular Member  
9250 Blue Ash Road  
Cincinnati, OH 45242-6822  
Phone: 513-792-7445  
Fax: 513-792-4042  
E-mail: squiresp5@yahoo.com  
Member since: 1979  
Spouse: Susan

Kant, Andrew P.  
Regular Member  
17270 Red Oak Drive, Ste 200  
Houston, TX 77090  
Phone: 281 440-6960  
Fax: 281 440-6205  
E-mail: apk@ksfortho.com  
Member since: 1991  
Spouse: Patricia

Juneau, Jr., Mark  
Regular Member  
Jefferson Orthopedic Clinic  
920 Avenue B  
Marrero, LA 70072  
Phone: 504-349-6804  
Fax: 504-349-6844  
Member since: 1997  
Spouse: Jeanne

Kappel, Stephen R.  
Emeritus Member  
8800 Bracken Circle  
St. Louis, MO 63123-1111  
Fax: 618-235-9020  
E-mail: srkmd@charter.net  
Member since: 1988  
Spouse: Mary

Kahn, Ralph H.  
Emeritus Member  
1400 N. Ritter Avenue, #351  
Indianapolis, IN 46219  
Fax: 317-259-8693  
Member since: 1993  
Spouse: Joan

Kasselt, Max R.  
Emeritus Member  
3424 Lakeview Trail  
Kinston, NC 28504  
Fax: 252-523-2953  
E-mail: mkasselt@suddenlink.net  
Member since: 1989  
Spouse: Gisela Kasselt
Kirchner, John S.
Regular Member
1313 13th Street South, # 226
Birmingham, AL 35205-5327
Phone: 205-930-8417
Fax: 205-930-8530
E-mail: john.kirchner@ortho.uab.edu
Member since: 2002
Spouse: Jane

King, Andrew
Regular Member
1542 Tulane Avenue
New Orleans, LA 70112
Phone: 504-568-4680
Fax: 504-568-4466
Member since: 2009
Spouse: Carey King

Spouse: Patricia Kenter

Kenter, Keith
Regular Member
Dept of Orthopaedic Surgery
Univ of Cincinnati
PO Box 670212
Cincinnati, OH 45267
Phone: 513-558-4592
Fax: 513-558-2220
E-mail: kenterk@ucmail.uc.edu
Member since: 2006
Spouse: Patricia Kenter

Kaufer, Herbert
Emeritus Member
209 E. Washington St. Ste #300
Ann Arbor, MI 48104
Fax: 734-668-0774
E-mail: hkauf@umich.edu
Member since: 1972
Spouse: Jane

Kennedy, Terence J.
Emeritus Member
733 W Latoka Drive, SW
Alexandria, MN 56308
Fax: 320-762-1935
E-mail: terken@charter.net
Member since: 1990
Spouse: Pat

Keener, William H.
Emeritus Member
3333 E. Florida Ave., #47
Denver, CO 80210
Member since: 1967
Spouse: Joanne

Kendrick, Ronald E.
Emeritus Member
911 Stoney Creek RD
Columbus, OH 43235
E-mail: ronekend@aol.com
Member since: 1986
Spouse: Suzanne

King, Andrew
Regular Member
1542 Tulane Avenue
New Orleans, LA 70112
Phone: 504-568-4680
Fax: 504-568-4466
Member since: 2009
Spouse: Carey King

Kirchner, John S.
Regular Member
1313 13th Street South, # 226
Birmingham, AL 35205-5327
Phone: 205-930-8417
Fax: 205-930-8530
E-mail: john.kirchner@ortho.uab.edu
Member since: 2002
Spouse: Jane
Kitziger, Kurt J.
Regular Member
The Carrell Clinic
9301 North Central Expressway
Dallas, TX 75231
Phone: 214-220-2468
E-mail: kkitziger@WBCarrellClinic.com
Member since: 1998
Spouse: Joanna

Kline, Jr., Duane M.
Emeritus Member
2812 Pine Drive
Cheyenne, WY 82001
Member since: 1967
Spouse: Joanna

Kohlmann, James
Regular Member
100 Deerpath Rd
PO Box 534
Charleston, IL 61920
Phone: 217-345-2727
Fax: 217-345-2781
Member since: 1999
Spouse: Ana Maria

Koman, L. Andrew
Regular Member
Dept of Orthopaedic Surg
Wake Forest Univ School of Med
Medical Center Blvd
Winston Salem, NC 27157-1070
Phone: 336-716-2878
Fax: 336-716-6286
E-mail: lakoman@wfubmc.edu
Member since: 1998
Spouse: Leigh

Kotcamp, Wayne W.
Emeritus Member
4701 Haley LN
Louisville, KY 40241-6143
E-mail: wayne kotcamp@insightbb.com
Member since: 1973
Spouse: Eileen

Kramer, James
Emeritus Member
4832 Greenhaven Drive
Saint Paul, MN 55127-7073
Phone: 612-227-1575
Member since: 1975
Spouse: Mimi

Koscielniak, Jr, Joseph B.
Regular Member
Orthopaedics Inc. of Indiana
5587 Broadway
Merrillville, IN 46410-2695
Fax: 219-884-3761
E-mail: docjbk@aol.com
Member since: 1987
Spouse: Mary Kathleen

Konkel, Kurt F.
Regular Member
Aurora Adv Healthcare, S.C.
Falls Division
N84W16889 Menomonee Ave
Menomonee Falls, WI 53051
Phone: 262-251-7500
Fax: 262-532-1554
E-mail: kkonke@ah.com
Member since: 2004
Spouse: Maureen Jane

Kohlmann, James
Regular Member
100 Deerpath Rd
PO Box 534
Charleston, IL 61920
Phone: 217-345-2727
Fax: 217-345-2781
Member since: 1999
Spouse: Ana Maria

Kotcamp, Wayne W.
Emeritus Member
4701 Haley LN
Louisville, KY 40241-6143
E-mail: wayne kotcamp@insightbb.com
Member since: 1973
Spouse: Eileen

Kramer, James
Emeritus Member
4832 Greenhaven Drive
Saint Paul, MN 55127-7073
Phone: 612-227-1575
Member since: 1975
Spouse: Mimi
Lamson, Michael  
Emeritus Member  
17030 Lakeside Hills Plz, Ste  
Omaha, NE 68130-2396  
Fax: 402-361-5276  
E-mail: mdlamson@tds.net  
Member since: 2006  
Spouse: Kathy

Kudrna, James  
Regular Member  
2150 Pfingsten Rd. Ste. B028  
Glenview, IL 60025  
Phone: 847-975-1562  
E-mail: jkudrna5@aol.com  
Member since: 2012

Kyle, Richard F.  
Regular Member  
701 Park Avenue  
Minneapolis, MN 55415  
Phone: 612-673-4220  
Fax: 612-904-4280  
Member since: 1982  
Spouse: Kathy

Kuhlman, Robert  
Emeritus Member  
12 Upper Barnes Rd.  
Saint Louis, MO 63124  
Fax: 314-997-2648  
E-mail: ocibones@sbcglobal.net  
Member since: 1973  
Spouse: Ana Maria

Kriegshauser, Lawrence A.  
Regular Member  
Premier Care Orthopaedics-South  
12639 Old Tesson Rd  
Saint Louis, MO 63128-2786  
Phone: 314-849-0311  
Fax: 314-849-2068  
Member since: 1987  
Spouse: Dianne

Kruckemyer, Alan  
Emeritus Member  
520 S. Sante Fe Ste 400  
Salina, KS 67801  
Phone: 785-827-2149  
Fax: 785-823-7459  
E-mail: akruckemyer@sbcglobal.net  
Member since: 1998  
Spouse: Marti

Krugel, Richard  
Regular Member  
18100 Oakwood Blvd, Ste 300  
Dearborn, MI 48124-4085  
Phone: 313-429-7977  
Fax: 313-429-7981  
E-mail: rskrugel@umich.edu  
Member since: 1986

Kuhlm, Robert  
Emeritus Member  
12 Upper Barnes Rd.  
Saint Louis, MO 63124  
Fax: 314-997-2648  
E-mail: ocibones@sbcglobal.net  
Member since: 1973  
Spouse: Ana Maria

Kratochvil, Bernard L.  
Emeritus Member  
Premier Care Orthopaedics-South  
12639 Old Tesson Rd  
Saint Louis, MO 63128-2786  
Phone: 314-849-0311  
Fax: 314-849-2068  
Member since: 1987  
Spouse: Dianne

Kudrna, James  
Regular Member  
2150 Pfingsten Rd. Ste. B028  
Glenview, IL 60025  
Phone: 847-975-1562  
E-mail: jkudrna5@aol.com  
Member since: 2012

Kyle, Richard F.  
Regular Member  
701 Park Avenue  
Minneapolis, MN 55415  
Phone: 612-673-4220  
Fax: 612-904-4280  
Member since: 1982  
Spouse: Kathy

Kruckemyer, Alan  
Emeritus Member  
520 S. Sante Fe Ste 400  
Salina, KS 67801  
Phone: 785-827-2149  
Fax: 785-823-7459  
E-mail: akruckemyer@sbcglobal.net  
Member since: 1998  
Spouse: Marti

Krugel, Richard  
Regular Member  
18100 Oakwood Blvd, Ste 300  
Dearborn, MI 48124-4085  
Phone: 313-429-7977  
Fax: 313-429-7981  
E-mail: rskrugel@umich.edu  
Member since: 1986
Longert, Alan L.
Emeritus Member
2237 Private Lane
Blacklick, OH 43004-9795
Fax: 614-939-0276
Member since: 1978
Spouse: Ruth

Lindsey, Ronald W.
Regular Member
Univ. of Texas Medical Branch
2316 Rebecca Sealy Hospital
301 University Blvd
Galveston, TX 77555
Phone: 409-747-5757
Fax: 409 747-5747
E-mail: rlindsey@utmb.edu
Member since: 1998
Spouse: Dale

Leb, Robert B.
Regular Member
23250 Mercantile Rd Ste 100
Beachwood, OH 44122
Fax: 216-831-5320
Member since: 1997
Spouse: Kathy Arian

Lidge, Ralph
Emeritus Member
3402 Garlands Lane
Barrington, IL 60010
Fax: 847-934-7228
E-mail: ratli@aol.com
Member since: 1957
Spouse: Jacquelyn

Ledbetter, Charles
Emeritus Member
1005 Floyd Avenue
Harrison, AR 72601
Fax: 870 741-8289
Member since: 1991
Spouse: Suzanne

Lindberg, Robert
Emeritus Member
PO Box 5797
Ketchum, ID 83340
Member since: 1995
Spouse: Patti

Levine, Monroe E.
Regular Member
9005 Grant St #200
Thornton, CO 80229
Phone: 303-287-2800
E-mail: levinem@centerforspinaldisorders.com
Member since: 2011
Spouse: Celinda

Lindsey, Ronald W.
Regular Member
Univ. of Texas Medical Branch
2316 Rebecca Sealy Hospital
301 University Blvd
Galveston, TX 77555
Phone: 409-747-5757
Fax: 409 747-5747
E-mail: rlindsey@utmb.edu
Member since: 1998
Spouse: Dale

Li, Z. John
Regular Member
Wake Forest School of Medicine
Dept of Orthopaedics
300 Medical Center Blvd
Winston-Salem, NC 27157-0003
Phone: 336-716-9651
Fax: 336-716-6286
E-mail: zli@wakehealth.edu
Member since: 2011

Longert, Alan L.
Emeritus Member
2237 Private Lane
Blacklick, OH 43004-9795
Fax: 614-939-0276
Member since: 1978
Spouse: Ruth
MacEwen, G. Dean
Honorary Member
Shriners Hospital
3551 N. Broad Street
Philadelphia, PA 19140
Phone: 215-430-4000
Fax: 215 430-4079
E-mail: gdmhm1@yahoo.com
Member since: 1990
Spouse: Marilyn

Mackay, Donald R.
Regular Member
1728 Adra Court
Las Vegas, NV 89102
Phone: 702 871-4242
Fax: 702 873-6456
E-mail: knowbones@Hotmail.com
Member since: 1992
Spouse: Janet

Mack, Robert
Emeritus Member
P O Box 1630
Carbondale, CO 81623
Phone: 970 963-5157
Fax: 970 963-5158
Member since: 1977
Spouse: Patty

Lutter, Lowell Dean
Emeritus Member
1600 University Avenue W #306
St. Paul, MN 55104
Fax: 651-232-4777
Member since: 2000

Lucas, George L.
Emeritus Member
1715 N. Cypress
Wichita, KS 67206
Fax: 316-634-2867
Member since: 1975
Spouse: Eleanor

Lyddon, Jr., Donald
Emeritus Member
4114 Landstrom Road
Rockford, IL 61114
E-mail: dwlyd@aol.com
Member since: 1981
Spouse: Virginia H. Lyddon

Lorrey, Cedric W.
Emeritus Member
4506 Wellington Boulevard
Alexandria, LA 71303
Member since: 1973
Spouse: Ann

Lowrey, Cedric W.
Emeritus Member
4506 Wellington Boulevard
Alexandria, LA 71303
Member since: 1973
Spouse: Ann

MacEwen, G. Dean
Honorary Member
Shriners Hospital
3551 N. Broad Street
Philadelphia, PA 19140
Phone: 215-430-4000
Fax: 215 430-4079
E-mail: gdmhm1@yahoo.com
Member since: 1990
Spouse: Marilyn

Mackay, Donald R.
Regular Member
1728 Adra Court
Las Vegas, NV 89102
Phone: 702 871-4242
Fax: 702 873-6456
E-mail: knowbones@Hotmail.com
Member since: 1992
Spouse: Janet

Mack, Robert
Emeritus Member
P O Box 1630
Carbondale, CO 81623
Phone: 970 963-5157
Fax: 970 963-5158
Member since: 1977
Spouse: Patty

Lutter, Lowell Dean
Emeritus Member
1600 University Avenue W #306
St. Paul, MN 55104
Fax: 651-232-4777
Member since: 2000

Lucas, George L.
Emeritus Member
1715 N. Cypress
Wichita, KS 67206
Fax: 316-634-2867
Member since: 1975
Spouse: Eleanor

Lyddon, Jr., Donald
Emeritus Member
4114 Landstrom Road
Rockford, IL 61114
E-mail: dwlyd@aol.com
Member since: 1981
Spouse: Virginia H. Lyddon

Mack, Robert
Emeritus Member
P O Box 1630
Carbondale, CO 81623
Phone: 970 963-5157
Fax: 970 963-5158
Member since: 1977
Spouse: Patty

Lutter, Lowell Dean
Emeritus Member
1600 University Avenue W #306
St. Paul, MN 55104
Fax: 651-232-4777
Member since: 2000

Lucas, George L.
Emeritus Member
1715 N. Cypress
Wichita, KS 67206
Fax: 316-634-2867
Member since: 1975
Spouse: Eleanor

Lyddon, Jr., Donald
Emeritus Member
4114 Landstrom Road
Rockford, IL 61114
E-mail: dwlyd@aol.com
Member since: 1981
Spouse: Virginia H. Lyddon

Mackel, Frederick O.
Emeritus Member
18319 Coldwater Rd.
Huntertown, IN 46748
Member since: 1965
Spouse: Alfrieda

Mackel, Frederick O.
Emeritus Member
18319 Coldwater Rd.
Huntertown, IN 46748
Member since: 1965
Spouse: Alfrieda

Lowrey, Cedric W.
Emeritus Member
4506 Wellington Boulevard
Alexandria, LA 71303
Member since: 1973
Spouse: Ann
Mackel, Jerry
Regular Member
Fort Wayne Orthopaedics, L.L.C
7601 West Jefferson Boulevard
Fort Wayne, IN 46801-2526
Phone: 260-436-8686
Fax: 260-432-5075
Member since: 1980
Spouse: Diane

Mankin, Henry J.
Honorary Member
Suite A
1122 Jackson Bldg.
Mass General Hospital
Boston, MA 2114
Fax: 617-724-7396
E-mail: hmankin@partners.org
Member since: 2000
Spouse: Carole

Maguire, Dennis W.
Emeritus Member
Mullaghduin
5 St. John’s Hill
Kinsale, Co. Cork
E-mail: kinsalemme@gmail.com
Member since: 1981
Spouse: Mary

Manoli, II, Arthur
Regular Member
44555 Woodward Ave Ste 503
Pontiac, MI 48341
Fax: 248-858-3921
E-mail: arthurmanoli@hotmail.com
Member since: 1985

Malik, William C.
Regular Member
Fairview Medical Center
412 63rd Street
Suite 101
Downers Grove, IL 60516
Phone: 630-719-5455
Fax: 630-719-5457
E-mail: wcmalikmd@comcast.net
Member since: 2001
Spouse: Carol

Margo, Marvin
Emeritus Member
1404 NW 122nd Unit 514
Oklahoma City, OK 73114
Phone: 405 842-8428
Member since: 1959
Spouse: Bobbie

Mangone, Peter G.
Regular Member
392 Racquet Club Road
Asheville, NC 28803
Phone: 828-258-8800
Fax: 828-281-7174
E-mail: pmangone@brbj.com
Member since: 2003
Spouse: Lee Anne

Markman, Alan W.
Regular Member
Tria Orthopaedic Center
8100 Northland Drive
Bloomington, MN 55431
Phone: 952 831-8742
Fax: 952 831-1626
E-mail: alan.markman@tria.com
Member since: 1990
Spouse: Wendy W.
McDevitt, William
Emeritus Member
2323 North Mayfair Road, Ste.3
Milwaukee, WI 53226
Phone: 414-771-5080
Fax: 414-771-6103
E-mail: mkmcd@mac.com
Member since: 1980
Spouse: Mary Kay

McBryde, Jr., Angus M.
Regular Member
USC Specialty Clinics
Orthopaedics
2 Medical Park, Ste 404
Columbia, SC 29203
Phone: 205-939-3699
Fax: 205-314-2555
E-mail: mcbrydea@aol.com
Member since: 1993
Spouse: Kay

McClure, James Grady
Emeritus Member
2957 Iroquois Road
Memphis, TN 38111-2615
Member since: 1963
Spouse: Marion

McDermott, John E.
Emeritus Member
1600 E Jefferson Street
Suite A5
Seattle, WA 98122-5656
Fax: 206-860-6666
Member since: 2007
Spouse: Gail

Matsu, Eddie T.
Regular Member
1201 Brook St
Sugar Land, TX 77478
Member since: 1985
Spouse: Anita

Mast, Jeffrey
Emeritus Member
Box 5657
Incline Village, NV 89540
Phone: 775-335-5466
Fax: 775-831-5535
E-mail: jeffmast@verizon.net
Member since: 1999
Spouse: Vernie

Martino, Robert S.
Emeritus Member
5587 Broadway
Merrillville, IN 46410-2362
Fax: 219-884-3761
E-mail: indorth@aol.com
Member since: 1984
Spouse: Lee

Marks, Richard
Regular Member
Medical College of Wisconsin
Dir, Div of Foot & Ankle Surg
9200 W. Wisconsin Avenue
Milwaukee, WI 53226
Phone: 414 805-7445
Fax: 414-805-7445
E-mail: rmarks@mcw.edu
Member since: 2003
Spouse: Louisa
McKechnie, James
Regular Member
1401 Wyndemere Point Drive
Champaign, IL 61822
Phone: 217-348-1030
Fax: 217-954-1602
E-mail: ksmeirink@sbobglobal.net
Member since: 1993
Spouse: Karen

McMains, Francis C.
Emeritus Member
8170 Old Hammond Highway
Baton Rouge, LA 70809
Member since: 1971
Spouse: Ann

McNeill, Jack
Emeritus Member
2121 Kirby Drive #55
Houston, TX 77019
Fax: 713-528-2223
E-mail: jackgmcmcll@gmail.com
Member since: 1976
Spouse: Kelly

Meirink, Thomas P.
Emeritus Member
346 Waverly Place Ct
Chesterfield, MO 63017
E-mail: smeirink@sbobglobal.net
Member since: 1981
Spouse: Suzanne

Merkert, Jr., George L.
Emeritus Member
3229 Leslie Dr.
Colorado Springs, CO 80909
Fax: 719 635-2855
E-mail: glmerkert@aol.com
Member since: 1967
Spouse: Karin

McQueen, David A.
Regular Member
7550 W. Village Cir. Ste 1
Wichita, KS 67205
Phone: 316-838-2020
Fax: 316-838-7574
E-mail: damcqueen1@gmail.com
Member since: 1993

Meyer, Frederick N.
Regular Member
6505 Sugar Pointe Ct.
Mobile, AL 36695-2741
Phone: 251-665-8250
Fax: 251-665-8255
E-mail: freddoc937@mac.com
Member since: 1989
Spouse: Melanie

Miles, James S.
Emeritus Member
1738 Regatta Dr
Amelia Island, FL 32034-5534
Fax: 760-202-7581
Member since: 1958
Spouse: Carolyn
Mussey, Robert Delevan  
Emeritus Member  
106 Meadow Dr  
Urbana, IL 61801-5822  
Fax: 217 344-5250  
E-mail: emussey@sbcglobal.net  
Member since: 1955  
Spouse: Elizabeth

Mumford, Jr., Earl  
Emeritus Member  
2120 Harbourside Dr Apt 641  
Longboat Key, FL 34228  
Phone: 941 360-2211  
Fax: 941 360-2233  
Member since: 1975  
Spouse: Ann

Moore, Kenneth L.  
Regular Member  
145 2nd Ave S  
Franklin, TN 37064  
Phone: 615-794-9863  
E-mail: kmoore43@comcast.net  
Member since: 1998  
Spouse: Linda

Millis, Michael B  
Regular Member  
300 Longwood Ave  
Boston, MA 2115  
Phone: 617 355-6773  
Fax: 617-730-0147  
E-mail: Michael.millis@childrens.harvard.edu  
Member since: 2006

Morgan, Jr., Randall C.  
Emeritus Member  
Suite 100  
2750 Bahia Vista Street  
Sarasota, FL 34239-2640  
Phone: 941 360-2211  
Fax: 941 360-2233  
Member since: 1989  
Spouse: Karen

Morgan, Steven J.  
Regular Member  
777 Bannock Street, #0188  
Denver, CO 80113  
Phone: 303-436-6498  
Fax: 303-436-6572  
E-mail: steven.morgan@dhha.org  
Member since: 2001  
Spouse: Virgina Thommen, MD

Millar, Edward A.  
Emeritus Member  
Shriners Hospital  
2211 North Oak Park Avenue  
Chicago, IL 60707  
Fax: 773-385-5488  
Member since: 1961  
Spouse: Dorothy

Millis, Michael B

Millar, Edward A.
Nahigian, Stanley H.  
Emeritus Member  
29001 Cedar Road  
Suite 519  
Cleveland, OH 44124  
Fax: 440-473-0075  
E-mail: shnahigianmd@aol.com  
Member since: 1970  
Spouse: Grace

Nix, J. Elmer  
Emeritus Member  
420 St. Andrews Drive  
Jackson, MS 39211  
Phone: 601 956-1651  
Fax: 601 956-1654  
E-mail: nix3838@aol.com  
Member since: 1974  
Spouse: Rosemary

Nasca, Richard  
Emeritus Member  
1912 Verazzano Dr  
Wilmington, NC 28405  
E-mail: rjnasca@aol.com  
Member since: 1982  
Spouse: Carol

Nordby, Eugene  
Emeritus Member  
7824 Courtyard Drive  
Madison, WI 53719-3517  
Phone: 608 831-2356  
Fax: 608-831-4101  
E-mail: ejnor@charter.net  
Member since: 1952  
Spouse: Olive

Nichols, Steven R.  
Regular Member  
P O Box 55487  
Birmingham, AL 35255  
Phone: 205-939-3699  
Member since: 2006

Niedermeier, William  
Regular Member  
35 Prairie Avenue, Ste 200  
Prairie Du Sac, WI 53578  
Phone: 608-643-1134  
Fax: 608-643-4788  
E-mail: iamnieds2@yahoo.com  
Member since: 1985  
Spouse: Mary Louise

Olson, L. Dale  
Emeritus Member  
Valparaiso Orthopedic Clinic  
601 Gateway N  
Chesterton, IN 46304-9650  
Phone: 919-668-1296  
Fax: 219-477-5694  
E-mail: olson016@mc.duke.edu  
Member since: 1968  
Spouse: Mickey

Olix, Melvin L.  
Emeritus Member  
3130 Kingstree Court  
Dublin, OH 43017  
Member since: 1969  
Spouse: Jean
Parsch, Klaus  
Honorary Member  
Weinbergweg-68  
Stuttgart, 70569  
E-mail: kparsch@t-online.de  
Member since: 1967  
Spouse: Marian

Parr, Jeffrey  
Regular Member  
Clarian Arnett Health  
2600 Ferry St  
PO Box 5545  
Lafayette, IN 47904  
Phone: 765-448-8154  
Fax: 765-448-7636  
E-mail: hipsurgeon@aol.com  
Member since: 1993  
Spouse: Gail Joy

Parker, Mervel V.  
Emeritus Member  
3801 Oak Grove Dr Unit 403  
Montgomery, AL 36116-1160  
Member since: 1967  
Spouse: Marian

Parr, Eugene  
Emeritus Member  
Mount Tabor Point  
3078 Clair Road  
Lexington, KY 40502-2976  
Member since: 1994  
Spouse: Joan

Orenstein, Eric  
Regular Member  
Clarian Arnett Health  
2600 Ferry St  
PO Box 5545  
Lafayette, IN 47904  
Phone: 765-448-8154  
Fax: 765-448-7636  
E-mail: hipsurgeon@aol.com  
Member since: 1993  
Spouse: Gail Joy

Orenstein, Eric  
Regular Member  
2301 25th St. S  
Ste G  
Fargo, ND 58103  
Fax: 701 232-0054  
E-mail: don@opgrande.com  
Member since: 1987  
Spouse: Carolyn

Parr, Jeffrey  
Regular Member  
125 E. Maxwell Street, Ste 202  
Lexington, KY 40508  
Fax: 859-253-9966  
Member since: 1994  
Spouse: Peggy Harrell Parr, Phd

Parr, Eugene  
Emeritus Member  
Mount Tabor Point  
3078 Clair Road  
Lexington, KY 40502-2976  
Member since: 1994  
Spouse: Joan

Parr, Jeffrey  
Regular Member  
125 E. Maxwell Street, Ste 202  
Lexington, KY 40508  
Fax: 859-253-9966  
Member since: 1994  
Spouse: Peggy Harrell Parr, Phd

Orenstein, Eric  
Regular Member  
2301 25th St. S  
Ste G  
Fargo, ND 58103  
Fax: 701 232-0054  
E-mail: don@opgrande.com  
Member since: 1987  
Spouse: Carolyn

Orenstein, Eric  
Regular Member  
2301 25th St. S  
Ste G  
Fargo, ND 58103  
Fax: 701 232-0054  
E-mail: don@opgrande.com  
Member since: 1987  
Spouse: Carolyn

Parr, Jeffrey  
Regular Member  
125 E. Maxwell Street, Ste 202  
Lexington, KY 40508  
Fax: 859-253-9966  
Member since: 1994  
Spouse: Peggy Harrell Parr, Phd

Orenstein, Eric  
Regular Member  
2301 25th St. S  
Ste G  
Fargo, ND 58103  
Fax: 701 232-0054  
E-mail: don@opgrande.com  
Member since: 1987  
Spouse: Carolyn

Orenstein, Eric  
Regular Member  
2301 25th St. S  
Ste G  
Fargo, ND 58103  
Fax: 701 232-0054  
E-mail: don@opgrande.com  
Member since: 1987  
Spouse: Carolyn

Parr, Jeffrey  
Regular Member  
125 E. Maxwell Street, Ste 202  
Lexington, KY 40508  
Fax: 859-253-9966  
Member since: 1994  
Spouse: Peggy Harrell Parr, Phd
Pittner, Richard C.
Emeritus Member
307 S 169th Circle
Omaha, NE 68118
Phone: 402 333-8932
Member since: 1975
Spouse: Joan

Post, Melvin
Emeritus Member
555 W. Armitage
Chicago, IL 60614
Member since: 1969
Spouse: Elaine Ann

Plattner, Paul
Regular Member
2300 N. Vermilion St.
Danville, IL 61833
Phone: 217-431-7830
Fax: 217-431-7766
Member since: 2003
Spouse: Susan

Price, William M.
Regular Member
10 Doctors Park
Gibson City, IL 60936-2009
Phone: 217 337-2477
Fax: 217 337-4597
E-mail: DoctPrice@aol.com
Member since: 1990
Spouse: Joan

Pope, David F.
Regular Member
224 Pecan Park Ave
Alexandria, LA 71303
Fax: 318-443-9190
Member since: 2002

Pruitt, Alexander
Regular Member
Orthopaedics, PC
20 West 6th St. Ste 1
Spencer, IA 51301
Phone: 712-580-2022
Fax: 712 580-2024
E-mail: apruit@ncn.net
Member since: 2002
Spouse: Jean

Popp, James
Regular Member
170 Taylor Station Rd.
Columbus, OH 43213
Phone: 614-545-7900
Fax: 614-864-7117
Member since: 2002
Spouse: Ronda

Ranawat, Chitranjan S.
Regular Member
535 East 70th Street
6th Floor
New York, NY 10021
Phone: 646-797-8700
Fax: 646-797-8777
E-mail: rocinnyc@rocinnyc.com
Member since: 2011
Randolph, Joseph C.  
Regular Member  
8450 Northwest Blvd.  
Indianapolis, IN 46278  
Phone: 317 802-2000  
Fax: 317-802-2170  
Member since: 1985  
Spouse: Mary Sue

Rasmussen, Mark R.  
Regular Member  
Kansas City Orthopaedic Inst  
3651 College Blvd, Ste 100B  
Leawood, KS 66211  
Fax: 913-253-1765  
Member since: 1997  
Spouse: Maureen

Randolph, Jr., Brady F.  
Emeritus Member  
1436 Cotswold Lane  
Hamilton, OH 45013-5188  
Fax: 513 895-2040  
Member since: 1966  
Spouse: Rhonda

Rasmussen, T. J.  
Regular Member  
3651 College Blvd  
Leawood, KS 66204  
Fax: 913-362-9614  
Member since: 1995  
Spouse: Lynn

Rangaswamy, Leela  
Regular Member  
116 Chandler Lane  
Wilmington, DE 19807  
Fax: 302-762-4944  
E-mail: leelarangaswamy1@mac.com  
Member since: 2000  
Spouse: Martin Hart

Ray, Joseph  
Emeritus Member  
PMB 180  
1204 Shleton Beach Rd, Ste 3  
Saraland, AL 36571-3036  
Phone: 251-554-3601  
Fax: 251-675-1782  
Member since: 1975  
Spouse: Delaine

Rapp, George  
Emeritus Member  
200 Forest Blvd.  
Indianapolis, IN 46240  
E-mail: rappprop@gmail.com  
Member since: 1973  
Spouse: Peggy

Ray, Robert D.  
Emeritus Member  
5757 Melita Road  
Santa Rosa, CA 95409-5639  
Fax: 415-892-1248  
E-mail: mariner@pacbell.net  
Member since: 1971  
Spouse: Genevieve
Riley, Mark B.
Regular Member
2700 East 29th St, #100
Bryan, TX 77802
Phone: 979-731-8888
Fax: 979-731-8848
Member since: 1991
Spouse: Jane

Riehl, J. Randall
Regular Member
Decatur Orthopaedic Clinic
1103 16th Ave S.E.
Decatur, AL 35601-3595
Phone: 256-350-0362
Fax: 256-350-0362
E-mail: jrriehl@charter.net
Member since: 2002
Spouse: Michelle

Richardson, David R.
Regular Member
7545 Airways Blvd
Southaven, MS 38671
Phone: 901-759-5541
Fax: 901-759-3217
Member since: 2007
Spouse: Julie Richardson

Reichard, K. Thomas
Emeritus Member
2425 Cherokee Parkway
Louisville, KY 40204-2216
Fax: 502-897-2725
E-mail: ktreichard@yahoo.com
Member since: 1985
Spouse: Mary Stuart

Reeg, Scot E.
Regular Member
Center for Scoliosis & Spinal
2390 Hemby Lane
Greenville, NC 27834
Phone: 252-752-9794
Fax: 252-752-9795
E-mail: sreeg1@suddenlink.net
Member since: 2002
Spouse: Brenda

Reeck, Jr., Claude C.
Emeritus Member
8919 Coventry Rd
Indianapolis, IN 46260
Member since: 1981
Spouse: Jackie

Rees, Harold
Regular Member
1134 Columbian Ave
Oak Park, IL 60302
Phone: 708-216-9349
E-mail: harees@lumc.edu
Member since: 2012

Riehl, J. Randall
Regular Member
Decatur Orthopaedic Clinic
1103 16th Ave S.E.
Decatur, AL 35601-3595
Phone: 256-350-0362
Fax: 256-350-0362
E-mail: jrriehl@charter.net
Member since: 2002
Spouse: Michelle

Regen, Jr., Eugene M.
Emeritus Member
3504 Echo Hill Road
Nashville, TN 37215
E-mail: reg@comcast.net
Member since: 1969
Spouse: Elizabeth

Riley, Mark B.
Regular Member
2700 East 29th St, #100
Bryan, TX 77802
Phone: 979-731-8888
Fax: 979-731-8848
Member since: 1991
Spouse: Jane
Rowland, Spencer A.
Emeritus Member
600 Seventh Street, S.E.
Cedar Rapids, IA 52401-2112
Member since: 1972
Spouse: Marian

Rodriguez, Raoul P.
Regular Member
1430 Tulane Ave, SL32
New Orleans, LA 70112
Phone: 504-988-2178
Fax: 504 988-3600
E-mail: rrodrig@tulane.edu
Member since: 1978
Spouse: Mari

Robbins, Randall R.
Regular Member
961 Oak Ridge Tpke
Oak Ridge, TN 37830-8832
Phone: 865-483-1906
Fax: 865-482-3848
E-mail: robbinsrr@tocdocs.com
Member since: 2000
Spouse: Tracey

Rodriguez, Ricardo J.
Regular Member
Baton Rouge Ortho. Clinic LLC
8080 Bluebonnet Blvd. #1000
Baton Rouge, LA 70810
Phone: 225-408-7845
Fax: 225-408-7929
E-mail: ricardo@brortho.com
Member since: 2000
Spouse: Tess

Robertson, Kathleen A.
Regular Member
1430 Tulane Ave SL32
New Orleans, LA 70112
Phone: 504 988-3515
Fax: 504 988-3517
E-mail: krobert1@tulane.edu
Member since: 2003

Rowe, Dale E.
Regular Member
MSU/KCMS
1000 Oakland Drive
Kalamazoo, MI 49008
Phone: 269 337-6250
Fax: 269-337-6222
E-mail: rowe@kcms.msu.edu
Member since: 1984
Spouse: Ellen

Roca, Jr., Cesar M.
Regular Member
Alabama Orthopedic Clinic
3610 Springhill Memorial Dr. N
Mobile, AL 36608
Phone: 251 410-3758
Fax: 251-410-3724
E-mail: acormd2@aol.com
Member since: 1997
Spouse: Theresa P. Roca, MD

Rowland, Spencer A.
Emeritus Member
222 Royal Oaks
San Antonio, TX 78209
Fax: 210 824-3340
E-mail: srowland@webtv.com
Member since: 1972
Spouse: Marian
Samberg, L. Carl  
Emeritus Member  
6115 Dunmore Drive  
West Bloomfield, MI 48322  
E-mail: bnscsamberg@aol.com  
Member since: 1978  
Spouse: Barbara

Rydlewicz, James A.  
Regular Member  
5233 W Morgan Ave Ste 102  
Milwaukee, WI 53220  
Phone: 414-321-8960  
Fax: 414-321-0632  
E-mail: rydlewiczdr@aol.com  
Member since: 2005  
Spouse: Janet

Russell, Garth  
Emeritus Member  
1 S Keene Street  
Columbia, MO 65201-7199  
Phone: 573-443-2402  
Fax: 573-876-8661  
Member since: 1975  
Spouse: Jane

Saer, J. Kenneth  
Emeritus Member  
1637 Octavia Street  
New Orleans, LA 70115  
Fax: 504-891-1753  
E-mail: kensaer@aol.com  
Member since: 1970  
Spouse: Phyllis

Russell, Robert V.  
Emeritus Member  
301 21st Avenue North  
Nashville, TN 37203  
Member since: 1978  
Spouse: Nanci

Salciccioli, Gino G.  
Emeritus Member  
3592 Walbri  
Bloomfield Hills, MI 48304  
Member since: 1975

Ryan, Thomas  
Emeritus Member  
2350 NW Savier St Ste 236  
Portland, OR 97210  
Phone: 503-624-6784  
Member since: 1967  
Spouse: Joan

Samberg, L. Carl  
Emeritus Member  
44 Sedge Fern Dr  
Hilton Head Island, SC 29926  
Phone: 843-342-7976  
Fax: 843-342-7986  
E-mail: bnscsamberg@aol.com  
Member since: 1978  
Spouse: Barbara
Schneider, John K.
Regular Member
8450 Northwest Blvd.
Indianapolis, IN 46278
Phone: 317-802-2000
Fax: 317-802-2050
E-mail: traderjks@hotmail.com
Member since: 1988
Spouse: Sue

Schaffer, Edward V.
Emeritus Member
3761 Sierra Drive
Merritt Island, FL 32953
Phone: 321-745-2588
E-mail: mjodisch@aol.com
Member since: 1961
Spouse: Mary Jo

Sawchuk, Frederick
Emeritus Member
710 North Avenue
Battle Creek, MI 49017
Fax: 616-969-6283
Member since: 1985
Spouse: Kathy

Sammarco, G. James
Emeritus Member
430 West Cliff Lane
Cincinnati, OH 45220
Phone: 513-751-0002
Fax: 513-751-0550
E-mail: sammarco@fuse.net
Member since: 1975
Spouse: Ruthann

Sammarco, Vincent J.
Regular Member
Cincinnati Sports Medicine
10663 Montgomery Road
Cincinnati, OH 45242-4403
Phone: 513-347-9999
Fax: 513-346-7299
E-mail: vjsammarco@cs moc.com
Member since: 2002
Spouse: Lakshmi

Samuelson, William
Regular Member
2800 Pierce St., Ste 101
Sioux City, IA 51104
Phone: 712-277-1662
Member since: 1990
Spouse: Donna

Sanders, Albert
Regular Member
7107 Brookside
San Antonio, TX 78209
Phone: 210-363-7767
Fax: 210-828-9127
E-mail: asanders1@satx.rr.com
Member since: 1977
Spouse: Shirley

Schaffer, Edward V.
Emeritus Member
3761 Sierra Drive
Merritt Island, FL 32953
Phone: 321-745-2588
E-mail: mjodisch@aol.com
Member since: 1961
Spouse: Mary Jo
Sellinger, D. Scott  
Emeritus Member  
5718 Roxbury Ct.  
Indianapolis, IN 46278  
Fax: 317-355-1179  
Member since: 1988  
Spouse: Terry  

Schoenecker, Perry L.  
Regular Member  
Shriners Hospital  
2001 South Lindbergh Boulevard  
Saint Louis, MO 63131-3597  
Phone: 314-872-7824  
Fax: 314-872-7808  
E-mail: pschoenecker@shrinenet.org  
Member since: 1979  
Spouse: Sally

Schnell, William F.  
Regular Member  
1000 East First Street, Ste 40  
Duluth, MN 55805  
Fax: 218-722-6515  
Member since: 1993  
Spouse: Dolly

Scheroder, F. William  
Emeritus Member  
219 Wagon Way  
Bastrop, TX 78602-3669  
Member since: 1985  
Spouse: Lou Ann

Schniegenberg, Gary  
Regular Member  
801 Medical Drive, Ste A  
Lima, OH 45804  
Phone: 419-222-6622  
Fax: 419-228-9285  
E-mail: garyschniegs@hotmail.com  
Member since: 1995  
Spouse: Sonna

Scioli, Mark W.  
Regular Member  
Center for Orthopedic Surgery  
4642 North Loop 289, Ste 101  
Lubbock, TX 79416  
Phone: 806-797-9124  
Fax: 806-797-0441  
E-mail: sciolilbk@aol.com  
Member since: 2000

Schoedinger, III, George R.  
Emeritus Member  
12639 Old Tesson Road  
Saint Louis, MO 63128-2786  
Phone: 314-849-0311  
Fax: 314-849-2068  
E-mail: grs@signaturehealth.net  
Member since: 1974  
Spouse: Lesley

Sellinger, D. Scott  
Regular Member  
Sheboygan Orthopaedic Associat  
2920 Superior Avenue  
Sheboygan, WI 53081  
Phone: 920-458-3791  
Fax: 920-458-3783  
E-mail: ssellinger@physhealthnet.com  
Member since: 1988  
Spouse: Terry
Selzer, Richard  
Honorary Member  
6 St. Ronan Terrace  
New Haven, CT 6511  
Phone: 203-624-7068  
Member since: 2000

Sheehan, Joseph C.M.  
Regular Member  
28 W 531 Roosevelt  
Winfield, IL 60190-1530  
Phone: 312-633-5922  
Fax: 630-787-2450  
E-mail: joseph.c.sheehan@gmail.com  
Member since: 1992  
Spouse: Norah

Seymour, Scott  
Regular Member  
353 E. Burlington St Ste 100  
Riverside, IL 60546-2082  
Phone: 708-442-0221  
Fax: 708-442-5670  
E-mail: s.seymour@comcast.net  
Member since: 1999  
Spouse: Giovanna

Simmons, William  
Emeritus Member  
1640 Timber Ridge  
Columbia, IL 62236  
Phone: 618-282-1937  
Member since: 1988  
Spouse: Laverne

Shapiro, Jules S.  
Emeritus Member  
1116 Calle Conejo  
Santa Fe, NM 87501  
Fax: 505-820-9339  
Member since: 1977  
Spouse: Marian J.

Sims, William A.  
Emeritus Member  
Decatur Orthopaedic Clinic  
1103 16th Avenue S.E.  
Decatur, AL 35601  
Phone: 256-350-0362  
Fax: 256-355-9779  
E-mail: wasims36@cs.com  
Member since: 1978  
Spouse: Betty

Sharp, R. Scott  
Regular Member  
2419 Surrey Lane, SE  
Decatur, AL 35601  
Phone: 256-350-0362  
E-mail: sharp_doc@yahoo.com  
Member since: 2009  
Spouse: Teresa

Slough, James A.  
Regular Member  
27 Mount Vernon  
Snyder, NY 14296  
Phone: 716-250-9999  
Fax: 716-250-4177  
E-mail: jslough@excelsiorortho.com  
Member since: 2006  
Spouse: Jeanne
Smiglielski, Michael J.  
Regular Member  
616 W. Forest Ave  
Jackson, TN 38301  
Fax: 731-422-0287  
E-mail: mjs38305@hotmail.com  
Member since: 2004  
Spouse: Sally

Spencer, Jr., George  
Emeritus Member  
109 Woodbury Ave.  
Mount Dora, FL 32757  
Phone: 352-735-9497  
Fax: 352-735-2449  
E-mail: Jspen36319@aol.com  
Member since: 1960  
Spouse: Jean

Smith, Buel S.  
Emeritus Member  
235 Lake Pointe Drive  
Akron, OH 79404  
Phone: 330-666-9645  
Fax: 330-665-4610  
Member since: 1972  
Spouse: Jean

Spray, Paul E.  
Emeritus Member  
507 Delaware Ave.  
Oak Ridge, TN 37830  
Fax: 865 483 8657  
E-mail: spray693@aol.com  
Member since: 1990  
Spouse: Louise

Smith, Donald Bryan  
Regular Member  
44 Circle Street  
Franklin, PA 16323  
Phone: 814-437-2191  
Fax: 814-437-2264  
E-mail: drsmithosm@verizon.net  
Member since: 2003  
Spouse: Debbie

Sprenger, Thomas R.  
Emeritus Member  
8221 DeSoto Memorial Hwy  
Bradenton, FL 34209-9790  
Fax: 941-792-1398  
Member since: 1991  
Spouse: Justine

Sokolowski, Mark  
Regular Member  
858 Mt. Vernon Ct.  
Naperville, IL 60563  
Phone: 630-962-7390  
E-mail: mjsokolowski@yahoo.com  
Member since: 2012  
Spouse: Margaret

Steensen, Robert N.  
Regular Member  
3777 Trueman Ct  
Hilliard, OH 43026-2496  
Fax: 614-488-0390  
Member since: 2002  
Spouse: Suzanne
Steffee, Jr., Arthur D.
Emeritus Member
PO Box 349
Foxburg, PA 16036-0349
Member since: 1973
Spouse: Patricia

Swanson, Alfred B.
Emeritus Member
2945 Bonnell Ave SE
Grand Rapids, MI 49506
E-mail: gswanson@comcast.net
Member since: 1962
Spouse: Genevieve de Groot

Stephenson, Charles T.
Emeritus Member
18558 Trail Bend Lane
Houston, TX 77084-3855
Fax: 281-491-1340
Member since: 1971
Spouse: Betty, MD

Sweeney, Howard J.
Emeritus Member
2325 Wood Drive
Northbrook, IL 60062
Phone: 847-570-2959
Fax: 847-272-7935
E-mail: hsweeney@globalorthro.org
Member since: 1968
Spouse: Kathleen

Stetten, Maynard L.
Emeritus Member
6020 S. Highway 53
Smithfield, KY 40068-9301
Fax: 502-412-2371
E-mail: mstet@bellsouth.net
Member since: 1979
Spouse: Nancy

Stetten, Maynard L.
Emeritus Member
6020 S. Highway 53
Smithfield, KY 40068-9301
Fax: 502-412-2371
E-mail: mstet@bellsouth.net
Member since: 1979
Spouse: Nancy

Strain, Jr, Richard E.
Regular Member
5001 SW 70th Ave
Davie, FL 33314
Fax: 954-961-1835
Member since: 2002
Spouse: Elizabeth

Tapscott, R. Stacy
Regular Member
1103 16th Ave SE
Decatur, AL 35601
Phone: 256-350-0362
Fax: 256-355-9779
E-mail: t4706@charter.net
Member since: 2008
Troyer, Marlin L.
Emeritus Member
2290 West Bertrand Rd
Niles, MI 49120
E-mail: Tmarlin6@aol.com
Member since: 1974
Spouse: Marilyn

Torkelson, Richard E.
Regular Member
2301 House Ave Ste 505
Cheyenne, WY 82001-3179
Phone: 307-632-9261
Fax: 307-634-9170
Member since: 1989
Spouse: Dorothy

Thompson, Jr., Samuel Berry
Regular Member
10301 Kanis Rd
Little Rock, AR 40502
Fax: 501-664-7714
Member since: 1985
Spouse: Diana

Trevino, Saul G.
Regular Member
1100 Virginia Ave
DC0953.00
Columbia, MO 65212-0001
Phone: 573-882-9236
E-mail: trevinos@health.missouri.edu
Member since: 2002
Spouse: Margaret

Tkach, Stephen
Emeritus Member
1110 N. Lee
Oklahoma City, OK 73103
Member since: 1989
Spouse: Donna DeNean

Trick, Lorence
Emeritus Member
PO Box 509
Elmendorf, TX 78112
Phone: 210-275-2173
Fax: 210 567-0893
E-mail: lwtrlet70@gmail.com
Member since: 1978
Spouse: Judy

Torch, Martin A.
Emeritus Member
2833 Elm Ave
Bexley, OH 43209-1815
Fax: 614-461-0528
E-mail: mtorch1@columbus.rr.com
Member since: 1975
Spouse: Shelia

Troyer, Marlin L.
Emeritus Member
2290 West Bertrand Rd
Niles, MI 49120
E-mail: Tmarlin6@aol.com
Member since: 1974
Spouse: Marilyn
Walter, Norman  
Regular Member  
8953 Bath Rd.  
Byron, MI 48418  
Fax: 810-266-6338  
E-mail: normwalter@aol.com  
Member since: 1981  
Spouse: Mary Jo

Vinje, Thomas  
Regular Member  
Sterling Rock Falls Clinic  
508 Walnut Street  
Sterling, IL 61081  
Phone: 815-625-4790  
E-mail: tvinje@comcast.net  
Member since: 2000  
Spouse: Laura

Wallace, Loring  
Emeritus Member  
4390 Thomas Park  
Beaumont, TX 77706-7769  
Fax: 409-895-0993  
Member since: 1967  
Spouse: Anne

Vessey, Michael  
Regular Member  
522 2nd Street  
Lake Oswego, OR 97034  
Phone: 503 344-6171  
Fax: 503-297-9357  
E-mail: mvessely@aol.com  
Member since: 1997  
Spouse: Michelle

Walter, Norman  
Regular Member  
8953 Bath Rd.  
Byron, MI 48418  
Fax: 810-266-6338  
E-mail: normwalter@aol.com  
Member since: 1981  
Spouse: Mary Jo

Van Demark, Jr., Robert  
Regular Member  
1210 West 18th Ste G01  
Sioux Falls, SD 57104  
Phone: 605 328-2663  
Fax: 605-328-3760  
E-mail: bobbyvd@aol.com  
Member since: 1989  
Spouse: Marilyn

Uggen, William M.  
Emeritus Member  
Kalamazoo Orthopaedic Clinic  
2490 S. 11th Street Ste 201  
Kalamazoo, MI 49009  
Fax: 616-343-0418  
E-mail: wuggen@tds.net  
Member since: 1981  
Spouse: Ruth Ann

Wade, Joseph  
Regular Member  
Ste 200  
1050 N James Campbell Blvd  
Columbia, TN 38401-2754  
Fax: 931-380-0513  
Member since: 2004  
Spouse: Stacey

Wallen, Loring  
Emeritus Member  
4390 Thomas Park  
Beaumont, TX 77706-7769  
Fax: 409-895-0993  
Member since: 1967  
Spouse: Anne

Turner, Robert  
Emeritus Member  
560 Black Bear Place N.E.  
Albuquerque, NM 87122-1821  
Phone: 505-858-0784  
Fax: 505-821-2489  
E-mail: rst560nm@aol.com  
Member since: 1977  
Spouse: Karen
White, Newton
Emeritus Member
13524 Royal Glen Drive
Saint Louis, MO 63131-1030
Phone: 314-434-5608
Fax: 314-434-3396
E-mail: nbw@charter.net
Member since: 1960
Spouse: Mary Ann

Warner, Jr., William
Regular Member
Campbell Clinic Inc.
1400 S. Germantown Road
Germantown, TN 38138
Phone: 901-759-3142
Fax: 901-759-3192
E-mail: wcwarner@comcast.net
Member since: 1997
Spouse: Susan

Watson, Jeffry
Regular Member
Vanderbilt Orthopaedic Inst
MCE South Tower Ste 3200
Nashville, TN 37232-8828
Phone: 615-322-4683
Fax: 615-343-5427
Member since: 2005

Weise, Marc
Regular Member
733 Asilo St
Arroyo Grande, CA 93420
Fax: 805-773-2650
E-mail: marcweise@yahoo.com
Member since: 1994
Spouse: Lorri

Weikert, Douglas
Regular Member
Vanderbilt Hand Center
Medical Center East, South Twr
Suite 3200
Nashville, TN 37232-8828
Fax: 615-343-8989
E-mail: douglas.weikert@vanderbilt.edu
Member since: 2002
Spouse: Rebecca

Westphal, Reinhard
Emeritus Member
665 Dorando Ct.
Marco Island, FL 34145
Phone: 239-394-7691
Fax: 941-394-7691
E-mail: westphal@comcast.net
Member since: 1980
Spouse: Toni

Weise, Marc
Regular Member
733 Asilo St
Arroyo Grande, CA 93420
Fax: 805-773-2650
E-mail: marcweise@yahoo.com
Member since: 1994
Spouse: Lorri

White, Newton
Emeritus Member
13524 Royal Glen Drive
Saint Louis, MO 63131-1030
Phone: 314-434-5608
Fax: 314-434-3396
E-mail: nbw@charter.net
Member since: 1960
Spouse: Mary Ann
White-Spunner, Suanne
Regular Member
3610 Springhill Memorial Dr, N
Mobile, AL 36608
Phone: 251-410-3864
Fax: 251-410-3744
E-mail: sawsn1@attglobal.net
Member since: 2001
Spouse: Cecil Crow

Williams, III, Claude
Emeritus Member
2731 Napoleon Avenue
New Orleans, LA 70115
Fax: 504-899-7317
Member since: 1979
Spouse: Connie

White, III, Augustus
Honorary Member
Harvard Medical School
Landmark East, 2L09
401 Park Drive
Boston, MA 2115
Phone: 617 998-8802
Fax: 617 384-8699
Member since: 2003
Spouse: Anita

Wolfe, David
Emeritus Member
P.O. Box 870
Belmont, TX 78604
Member since: 1975
Spouse: Mary

Wiedel, Jerome
Emeritus Member
1236 Ridge View Dr.
Steamboat Springs, CO 80487
Phone: 720-848-2171
Fax: 720-848-2157
Member since: 1982
Spouse: Mary Jo

Wood III, E. Greg
Regular Member
2470 Flowood Drive
Flowood, MS 39232
Phone: 601 983-2804
Fax: 601 932-7279
E-mail: greg.woodiii@gmail.com
Member since: 1996
Spouse: Kelly

Williams, Ronald
Regular Member
Texas Oncology
901 W. 38th St, Ste 200
Austin, TX 78705
Phone: 210-567-5132
Fax: 210-567-5167
E-mail: ronald.williams@usoncology.com
Member since: 1979
Spouse: Neva

York, Jr., Byron
Emeritus Member
2155 Goldsmith
Houston, TX 77030
Fax: 713 665-0834
E-mail: byronyork@mac.com
Member since: 1975
Spouse: Amber
Zuege, Robert
Emeritus Member
625 East St. Paul Avenue
Milwaukee, WI 53202
Fax: 414-223-2724
Member since: 1971
Spouse: Mary

Zarzour, Robert
Regular Member
609 Fairfax Road, W
Mobile, AL 36608
Phone: 251-410-3600
Fax: 251-533-7986
E-mail: rjzarzour@gmail.com
Member since: 1994
Spouse: Katherine

Yount, Ira
Emeritus Member
27 Donore Sq.
San Antonio, TX 78229
E-mail: imyount@aol.com
Member since: 1994
Spouse: Barbara
ALABAMA
Birmingham
Cain, E. Lyle
Deinlein, Donald A.
Gould, John S.
Kirchner, John S.
Nichols, Steven R.
Decatur
Hofammann, Dabney
Jenkins, Jr., Ewin B.
Riehl, J. Randall
Sharp, R. Scott
Sims, William A.
apscott, R. Stacy
Mobile
Allen, III, Herbert
Daugherty, Jr., M. Preston
Donahoe, David K
Granberry, Michael L.
Hudgens, Russell A.
Meyer, Frederick N.
Pearsall, IV, Albert W.
Roca, Jr., Cesar M.
White-Spunner, Suanne
Zarzour, Robert
Montgomery
Fletcher, Jr., Charles
Hester, Roland A.
Hodurski, Donald F.
Parker, Mervel V.
Saraland
Ray, Joseph
Tuscaloosa
Boston, Jr., H. Chester

ARIZONA
Green Valley
Hayes, James

ARKANSAS
Fort Smith
Irwin, Peter
Harrison
Ledbetter, Charles
Little Rock
Thompson, Jr., Samuel Berry

CALIFORNIA
Arroyo Grande
Weise, Marc
San Diego
Friedman, Barry A.
Santa Rosa
Ray, Robert D.

COLORADO
Carbondale
Mack, Robert
Colorado Springs
Carlton, Robert
Merkert, Jr., George L.
Oppenheim, Judith
Denver
Cotton, Ralph L.
Eckhoff, Donald G.
Keener, William H.
Morgan, Steven J.
Durango
Furry, Dean L.
Furry, Kim
Longmont
Cletcher, Jr., John O.
Steamboat Springs
Wiedel, Jerome
Thornton
Jolly, Susan
Levine, Monroe E.

CONNECTICUT
New Haven
Selzer, Richard

DELAWARE
Wilmington
Rangaswamy, Leela

FLORIDA
Amelia Island
Miles, James S.
Bradenton
Sprenger, Thomas R.
Davie
Strain, Jr, Richard E.
Jupiter
   Pellicore, Raymond

Longboat Key
   Mumford, Jr., Earl

Longwood
   Harris, Herbert

Marco Island
   Westphal, Reinhard

Merritt Island
   Schaffer, Edward V.

Mount Dora
   Spencer, Jr., George

Naples
   Alfred, Karl
   DeFreest, Lynn J.

Sarasota
   Morgan, Jr., Randall C.

Titusville
   Grunsten, Russell C.

GEORGIA

Athens
   Dorris III, John R

Carrollton
   Hubbard, Charles N.

Douglas
   DePersio, Kenneth P.

Warm Springs
   Eyler, Don L.

IDAHO

Ketchum
   Lindberg, Robert

ILLINOIS

Barrington
   Lidge, Ralph

Carbondale
   Brown, Treg

Champaign
   Dangles, Chris
   McKechnie, James

Charleston
   Kohlmann, James

Chicago
   Anderson, Gunnar
   Galante, Jorge O.
   Millar, Edward A.
   Post, Melvin

Columbia
   Simmons, William

Danville
   Plattner, Paul

Downers Grove
   Malik, William C.

Effingham
   Bonutti, Peter

Galesburg
   Bussey, Kenneth

Geneva
   Denker, Merle J.

Gibson City
   Price, William M.

Glenview
   Geline, Richard Allen
   Gleason, Thomas
   Kudrna, James

Hinsdale
   Gilligan, William J.

Lake Forest
   Apfelbach, Henry

Lincolnwood
   Haskell, Saul

Melrose Park
   Holmes, Henry M.

Mount Vernon
   Chow, James C.
   Froehling, Alan L.

Naperville
   Sokolowski, Mark

Northbrook
   Sweeney, Howard J.

Oak Brook
   Ahstrom, Jr., James

Oak Park
   Barmada, Riad
   Brackett, III, E. Boone
   Rees, Harold
River Forest
    Colmey, Thomas

Riveride
    Hejna, William F.
    Seymour, Scott

Rockford
    Lyddon, Jr., Donald

Springfield
    Freitag, Per

Sterling
    Vinje, Thomas

Urbana
    Mussey, Robert Delevan

Wilmette
    Grinblat, Enrique

Winfield
    Sheehan, Joseph C.M.

**INDIANA**

Bloomington
    Booze, James

Carmel
    Clayton, Robert

Chesterton
    Olson, L. Dale

Evansville
    Bloss, Bryant

Fort Wayne
    Mackel, Jerry

Huntertown
    Mackel, Frederick O.

Indianapolis
    Kahn, Ralph H.
    Pierce, Jr., Raymond
    Randolph, Joseph C.
    Rapp, George
    Reeck, Jr., Claude C.
    Schneider, John K.
    Schneider, Paul

Lafayette
    Devlin, Terrance
    Orenstein, Eric

Lebanon
    Garber, John E.

Merrillville
    Koscielniak, Jr, Joseph B.

Merrillville
    Martino, Robert S.

Munster
    Harvey, David M.

South Bend
    Bankoff, David

Vincennes
    Herman, Sr., Daniel

Zionsville
    Brueckmann, F. Robert

**IOWA**

Cedar Rapids
    Robb, W. John

Marshalltown
    Cooper, Douglas M.

Sioux City
    Samuelson, William

Spencer
    Pruitt, Alexander

West Des Moines
    Kelley, John H.

Windsor Heights
    Cooper, Jr., Hugh E.

**KANSAS**

Augusta
    Pence, Charles D.

Kansas City
    Templeton, Kimberly J.

Leawood
    Garner, Jr., James H.
    Hamilton, James J.
    Jones, Jr., Lowry
    Rasmussen, Mark R.
    Rasmussen, T. J.

Salina
    Kruckemyer, Alan

Wichita
    Do, Pat
    Lucas, George L.
    McQueen, David A.

**KENTUCKY**

Lexington
    Mitchell, David C.
    Parr, Eugene
    Parr, Jeffrey
Kaufer, Herbert
Battle Creek
Allen, Richard
Sawchuk, Frederick

Salciccioli, Gino G.

Byron
Walter, Norman

Dearborn
Krugel, Richard

Frankfort
Johnson, Lanny L.

Franklin
Castle, Maurice E.

Grand Rapids
Edholm, Curtis D.
Glessner, Jr., James
Greene, Jr., Perry W.
Swanson, Alfred B.

Kalamazoo
Rowe, Dale E.
Uggen, William M.

Niles
Troyer, Marlin L.

Petoskey
Darmschroder, Allen D.
Jodar, Loyal

Pontiac
Manoli, II, Arthur

W. Bloomfield
Green, Milton M.
Roy, L. James

West Olive
Hoekman, Ronald

Ypsilanti
Henke, John A.

MINNESOTA
Alexandria
Kennedy, Terence J.

Bloomington
Markman, Alan W.

Cambridge
Coleman, Thomas P.

Duluth
Schnell, William F.
Springfield
   Clarke, Michael
St. Charles
   DiFilippo, Emil A.

MONTANA
Helena
   Bishop, Don

NEBRASKA
Omaha
   Fitzgibbons, Timothy C.
   Hood, L. Thomas
   Kratochvil, Bernard L.
   Pitner, Richard C.

NEVADA
Incline Village
   Mast, Jeffrey
Las Vegas
   Mackay, Donald R.

NEW MEXICO
Albuquerque
   Turner, Robert
Santa Fe
   Shapiro, Jules S.

NEW YORK
Lowville
   Campbell, Dwight
New York
   Ranawat, Chitranjan S.
Snyder
   Slough, James A.

NORTH CAROLINA
Asheville
   Mangone, Peter G.
Chapel Hill
   Hurwitz, Shepard R.
Durham
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Greenville
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Kinston
   Kasselt, Max R.
Raleigh
   Jones, David T.

MISSOURI
Chesterfield
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Columbia
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   Bal, Sonny
   Russell, Garth
   Trevino, Saul G.
Kansas City
   Barnard, Jr, John
Rocheport
   Ellsasser, James C.
Saint Louis
   Kappel, Stephen R.
   Kriegshauser, Lawrence A.
   Kuhlman, Robert
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   White, Newton

MINNESOTA
Minneapolis
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   Heller, Mark A.
   Kyle, Richard F.
Rochester
   Berry, Daniel
   eterson, Lowell F.A.
Saint Paul
   Gislon, Paul H.
   Kramer, James
   Wenz, Erwin
   Lutter, Lowell Dean

MISSISSIPPI
Columbus
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Flowood
   Wood III, E. Greg
Gulfport
   Johansen, R. Lance
Jackson
   Berry, Sidney
   Nix, J. Elmer
Long Beach
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Southaven
   Richardson, David R.
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Schniegenberg, Gary
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Pepper Pike
Brooks, Dennis
Powell
Coleman, Carl
Shaker Heights
Froimson, Avrum I.
Lawton
Johnson, Wayne
Oklahoma City
Brown, David
Margo, Marvin
Tkach, Stephen
Owasso
Harrison, Jr., William
Tulsa
Dunitz, Norman
Griffin, James
Gross, Worth

OREGON
Lake Oswego
Vessely, Michael
Portland
Ryan, Thomas

PENNSYLVANIA
Cranberry Twp
Bowman, Michael
Foxburg
Steffee, Jr., Arthur D.
Franklin
Smith, Donald Bryan
Philadelphia
Campbell, Jr., Robert
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Camden
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Columbia
McBryde, Jr., Angus M.
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Weslaco
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**VERMONT**

Berlin
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**VIRGIN ISLANDS**

St Thomas
   Bubb, Stephen

**WASHINGTON**

Seattle
   McDermott, John E.

**WISCONSIN**

Brookfield
   Collopy, Michael

Eau Claire
   Ihle, Peter M.

Madison
   Duck, Holly J.
   Huffer, James M.
   Nordby, Eugene

Menomonee Falls
   Konkel, Kurt F.

Milwaukee
   Flatley, Thomas
   Hackbarth, Jr., Donald A.
   Marks, Richard
   McDevitt, William
   Rydlewicz, James A.
   Zuege, Robert

Prairie du Sac
   Lamson, Michael
   Niedermeier, William

Sheboygan
   Gore, Donald R.
   Sellinger, D. Scott

**WYOMING**

Cheyenne
   Kline, Jr., Duane M.
   Torkelson, Richard E.
ARTICLE 1
General
Section 1. Name. The name of the corporation is Clinical Orthopaedic Society, Inc. (the “Society”).

Section 2. Address and Agent. The address of the Society’s initial registered office and the name of the registered agent at such address shall be that address and name reflected in the Articles of Incorporation of the Society (the “Articles”).

Section 3. Fiscal Year. The fiscal year of the Society shall begin on the first day of January and end on the last day of December.

Section 4. Purpose. The purpose of the Society is the advancement of clinical orthopaedics through teaching and education of the members and other orthopaedists.

ARTICLE II
Members
Section 1. General. Membership in the Society shall be governed by the provisions of the Articles and these Bylaws. The members shall be one (1) or more members of the orthopaedic community who support the Society’s exempt purposes and who meet the criteria established from time to time by the Board of Directors. Such members shall be admitted only in accordance with the procedures set forth in these Bylaws.

Section 2. Classification of Members. The members of the Society shall consist of the following cases:

(a) Regular Members. Regular Members shall be orthopaedic surgeons, residing in the United States or Canada, who have become diplomats of the American Board of Orthopaedic Surgery, the American Osteopathic Board of Orthopaedic Surgery or the Royal College of Physicians and Surgeons of Canada, or have made outstanding contributions to orthopaedic surgery. Regular Members shall pay dues, may vote and may hold office.

(b) Emeritus Members. Upon retirement from active practice or upon reaching seventy (70) years of age, a dues paying member in good standing for a minimum of seven (7) years, may become an Emeritus Member by requesting a change in membership status by sending a letter to the Secretary-Treasurer. Emeritus Members retain the privilege of attending the annual meetings, and have the privilege of the floor, but may not vote or hold office and are not required to pay dues.
International Members. International Members are outstanding orthopaedists who are not residents of the United States or Canada. International members pay dues, and may attend meetings, but may not vote or hold office.

Honorary Members. Outstanding orthopaedists who are not members of the Society but have contributed significantly to the field of orthopaedics may be admitted as Honorary Members. Honorary Members do not pay dues. They may attend the annual meeting but may not vote or hold office.

Candidate Members. Candidate members shall be duly elected orthopaedic surgeons residing in the United States or Canada who have graduated from orthopaedic residency programs accredited by the Liaison Committee on Medical Education (LCME), the Committee on Accreditation of Canadian Medical Schools (CACMS) or the American Osteopathic Association (AOA) Bureau of Professional Education and have not yet achieved board certification as required in Section 2(A). Upon such certification Candidate members shall be advanced to regular membership. Candidate Membership is limited to three years after completion of residency or fellowship. If board certification is not achieved in that period, the candidate's membership will be terminated. Candidate Members are not required to pay dues, but may be committee members, vote on committees to which they are appointed and have the privilege of the floor.
that case, the former member may not reapply until a period of three (3) years from the date of termination has elapsed.

Section 7. Place of Meetings. Every meeting of the members shall be held at such a place that the Board of Directors selects from time to time.

Section 8. Annual and Special Meetings. Each annual meeting of the members shall be held on a date set by the Board of Directors, but not less frequently than once per year. Except as otherwise provided by law, special meetings of the members may be called only by the Board of Directors. There shall be at least one business session of the membership at each annual or special meeting, at which the President shall preside. The latest edition of Robert's Rules of Order will serve as a guide at the business meetings of the Society. At any special meeting of the Society, only those matters that are within the purposes described in the meeting notice may be voted on by the members.

Section 9. Notice of Meetings. The Society shall give notice of meetings of members to each of the members setting forth the place, date, and time of each annual, regular, and special meeting of the members at least one (1) month before the meeting date. Notice of any annual or regular meeting shall include a description of any matter or matters to be considered at the meeting that must be approved by the members, and notice of any special meeting shall include a description of the purpose for which the meeting is called.

Section 11. Waiver of Notice. Notice may be waived in writing, signed by the member entitled to notice, and filed with the minutes or the corporate records. Attendance at or participation in any meeting (a) waives objection to lack of notice or defective notice unless the member at the beginning of the meeting objects to holding the meeting or transacting business at the meeting and (b) waives objection to consideration of a particular matter at the meeting that is not within the purposes described in the meeting notice, unless the member objects to considering the matter when the matter is presented.

Section 12. Representation by Proxy. Voting by proxy shall be permitted only at special meetings of the Society and only if the member or the member's attorney-in-fact appoints such proxy in a signed, written or electronic form delivered to the Society. The appointment of a proxy shall not be valid after eleven (11) months from the appointment date unless a longer time is expressly provided therein. An appointment of a proxy is revocable by the member.

Section 13. Quorum for Meetings. At all meetings of the members, a quorum shall consist of ten percent (10%) of the Regular Members. After a vote is taken for any purpose at a meeting, a quorum is considered present for the remainder of the meeting and for any adjournment of that meeting. Any meeting of the member, including an annual or special meeting or any adjournment thereof, may be adjourned to a later date if less than a quorum is present.

Section 14. Vote of Members. Each Regular Member of the Society shall be entitled to one (1) vote on each matter to come before the members. Except as otherwise required by law, the Articles or these Bylaws, each question shall be determined by majority vote of the
Regular Members entitled to vote, represented in person or by proxy, at a meeting at which a quorum exists. Cumulative voting is not permitted.

Section 15. Action by Written or Electronic Consent. Any action required or permitted to be taken at any meeting of the members may be taken without a meeting if the action is approved by members holding at least eighty percent (80%) of the votes entitled to be cast on the action. The action must be evidenced by at least one (1) consent describing the action taken that is:

(a) signed by the members representing at least eighty percent (80%) of the votes entitled to be cast on the action; and
(b) included in the minutes or filed with the Society’s records reflecting the action taken.

Requests for consents must be delivered to all members.

Section 16. Action by Written or Electronic Ballot. Any action that may be taken at an annual, regular, or special meeting of the members may be taken without a meeting if the Society delivers a ballot or notice of ballot or any approved method to every member entitled to vote on the action. A ballot must set forth each proposed action and provide an opportunity to vote for or against each proposed action. Approval of such ballot is valid only when the number of votes cast by ballot equals or exceeds the quorum required to be present at a meeting authorizing the action and the number of approvals equals or exceeds the number of votes that would be required to approve the matter at a meeting at which the total number of votes cast was the same as the number of votes cast by ballot. A solicitation for votes by such ballot must (a) indicate the number of responses needed to meet the quorum requirements, (b) state the percentage of approvals necessary to approve each matter other than the election of directors, and (c) specify the time by which a ballot must be received by the Society to be counted. Such a ballot may not be revoked.

Section 17. Means of Communication. The Society and the Board of Directors may (a) permit a member to participate in an annual, a regular, or a special meeting by, or (b) conduct an annual, a regular, or a special meeting through the use of any means of communication by which all members participating may simultaneously hear each other during the meeting. A member participating in a meeting by such means shall be considered present in person at the meeting.

ARTICLE III
Board of Directors

Section 1. Number, Election, and Term. The affairs of the Society shall be managed, controlled, and conducted by, and under the supervision of, the Board of Directors, subject to the provisions of the Articles and these Bylaws. The Board of Directors shall consist the President, First President Elect, Second President Elect, Secretary-Treasurer, Librarian-Historian, Immediate Past President and a member under the age of 40 at the time of his/her election, these members shall also comprise the Executive Committee of the Board, and other members consisting of the two (2) Past Presidents serving prior to the Immediate Past President and three (3) Members-at-Large, elected by the members entitled to vote. All
members of the Board of Directors shall be members in good standing. In the event any of
the above-designated individuals is not a member in good standing or is unable to serve as
a Director, the number of Directors shall be reduced accordingly, provided that the number of
Directors shall be no less than three (3). In such event, the Board shall immediately fill any
vacancy required to maintain at least three (3) directors. The three (3) Members-at-Large
and the Member under the age of 40 shall be Regular or Candidate Members in good stand-
ing who shall serve three (3) year staggered terms. The Executive Committee shall exercise
the authority of the Board of Directors in the interim between board meetings.

Section 2. Quorum and Voting. A majority of directors in office immediately before a meeting
begins shall constitute a quorum for the transaction of any business properly to come before
the Board of Directors. Unless otherwise provided in the Articles or these Bylaws, the act of a
majority of the directors present at a meeting at which a quorum is present shall be the act of
the Board of Directors.

Section 3. Meetings. The Board of Directors may hold regular meetings, as fixed by these
Bylaws or by resolution of the Board of Directors, for the purpose of transacting such
business as properly may come before the Society's Board of Directors and may hold special
meetings for any lawful purpose which need not be specified in the notice of the meeting.
The latest edition of Robert's Rules of Order will serve as a guide at all business meetings of
the Board of Directors.

Section 4. Notice of Meetings. A notice stating the date, time and place of any meeting of
the Board of Directors or a committee thereof shall be mailed or electronically transmitted
to each member of the Board of Directors or such committee, as applicable, at least one (1)
month before the date of the meeting.

Section 5. Waiver of Notice. Notice may be waived in writing, signed by the director entitled
to notice, and filed with the minutes or the corporate records. Attendance at or participation
in any meeting (a) waives objection to lack of notice or defective notice unless the director
at the beginning of the meeting objects to holding the meeting or transacting business at the
meeting and (b) waives objection to consideration of a particular matter at the meeting that
is not within the purposes described in the meeting notice, unless the director objects to
considering the matter when the matter is presented.

Section 6. Means of Communication. The Board of Directors, or a committee thereof,
may (a) permit a director or a committee to participate in an annual, a regular, or a special
meeting by, or (b) conduct an annual, a regular, or a special meeting through the use of any
means of communication by which all directors or committee members participating may
simultaneously communicate with each other during the meeting. A director or committee
member participating in a meeting by such means shall be considered present in person at
the meeting.

Section 7. Action by Written Consent. Any action required or permitted to be taken at any
meeting of the Board of Directors, or any committee thereof, may be taken without a meeting
if a written consent describing such action is signed by each director or committee mem-
ber and such written consent is included in the minutes or filed with the corporate records.
reflecting the action taken. Action taken by written consent shall be effective when the last
director or committee member signs the consent, unless the consent specifies a prior or
subsequent effective date. A consent signed as described in this Section 7 shall have the
effect of a meeting vote and may be described as such in any document.

Section 8. Additional Duties. In addition to the duties imposed on the Board of Directors by
these Bylaws, the Board of Directors shall provide such arrangements as are appropriate for
meetings of the members, appointing committees for such purposes as necessary.

Section 9. Compensation. Directors, as such, shall not receive any stated compensation for
their services as directors, but the Board of Directors may, by resolution, authorize reim-
bursement for reasonable expenses incurred in the performance of their duties. The Board of
Directors will from time to time review the reimbursement policy.

ARTICLE IV
Officers

Section 1. In General. The officers of the Society shall be a President, a First President Elect,
a second President Elect, a Secretary-Treasurer and a Librarian-Historian, each of which shall
be elected by the members in accordance with Article VI. An officer may simultaneously hold
more than one (1) office. Each officer that is elected by the Board of Directors at a regular or
special meeting shall serve for one (1) year, or such other period as is prescribed by the di-
rectors at the time of such election, and until the officer's successor is elected and qualified.
Any officer elected by the Board of Directors may be removed by the Board of Directors and
any officer elected by the members may be removed by the members, each with or without
cause. Any vacancy occurring in any office shall be filled by the Board of Directors, and the
person elected to fill such vacancy shall serve until the expiration of the term vacated.

Section 2. President. The President shall be the chief executive officer and Chairman of
the Board of Directors. He or she shall preside at all general meetings of the Society and
of the Board of Directors. He or she may sign, with the Secretary or any other proper officer
or agent of the Society authorized by the Board, any deeds, mortgages, bonds, contracts
or other instruments which the Board has authorized to be executed, except in case where
the signing and execution thereof shall be expressly delegated to the Board of Directors by
these Bylaws or by law to some other officer or agent of the Society. He or she shall appoint
the members of any regular or special committee or task force not otherwise provided for in
the Bylaws with the approval of the Board of Directors. The President shall be a non-voting
ex-officio member of all committees except the Membership, Resolutions, Bylaws and Nom-
inating Committees. He or she may fill any vacancies which may occur in any committee or
task force of the Society, during the period between annual meetings, subject to the approval
of the Board of Directors at its next meeting, unless otherwise specified in these Bylaws. He
or she is authorized to act in the event of any contingency or emergency not covered by the
Bylaws. He or she shall, in general, perform all duties incident to the office of the President
and such other duties as the Board may prescribe.

Section 3. First President Elect. In the absence of the President, the First President Elect
will perform the duties of the President. The First President Elect will succeed to the office
of President at the conclusion of the annual meeting, or if the President dies or is unable or
refuses to act. If the First President Elect succeeds to the office of President for any reason other than natural succession by expiration of the current President’s term of office, the First President Elect shall serve for the remaining unfulfilled term of the replaced President and further serve the one (1) year term of office that he or she normally would have served. The First President Elect shall perform such other duties as the President or Board of Directors may assign. The First President Elect shall serve as Chairman of the Membership Committee.

Section 4. Second President Elect. The Second President Elect will succeed to the office of First President Elect at the end of the annual meeting or at any time the First President Elect is unable or refuses to act, or at any time the First President Elect assumes the duties of the President. The Second President Elect shall perform such duties as the President or Board of Directors may assign.

Section 5. Secretary-Treasurer. The Secretary-Treasurer shall be the custodian of all papers, books, and records of the Society. The Secretary-Treasurer shall send notice of, keep a register or all members present at, and prepare the minutes or all meetings of the members and of the Board of Directors. The Secretary-Treasurer shall authenticate records of the Society as necessary. The Secretary-Treasurer shall prepare and maintain correct and complete records of account showing accurately the financial condition of the Society and shall furnish, whenever requested by the Board of Directors or the President, a statement of the financial condition of the Society. All notes, securities, and other assets coming into the possession of the Society shall be received, accounted for, and placed in safekeeping as the Secretary-Treasurer may from time to time prescribe. The Secretary-Treasurer shall notify new members of their election, collect the dues, have charge of all funds of the Society and perform such other duties that may be reasonably expected of the Secretary-Treasurer or as are prescribed by the President or the Board of Directors. The Secretary-Treasurer shall chair the Finance Committee. If the President, First President Elect and Second President Elect all die or are unable to refuse to act, the Secretary-Treasurer shall assume the duties of the President. The Secretary-Treasurer shall be elected annually, shall not serve longer than five (5) consecutive years.

Section 6. Library-Historian. The Librarian-Historian will be elected annually, not to serve for longer than five (5) consecutive years, and shall keep a record of on-going activity and history of the Society, and present a necrology report at the annual meeting. The Librarian-Historian shall serve as Chairman of the Bylaws Committee.

ARTICLE V
Committees

Section 1. Executive Committee. Those officers of the Society specified in Section 1 of Article III shall constitute the Executive Committee of the Board of Directors. The Executive Committee shall meet regularly and as necessary. The President shall convene the Executive Committee. The Executive Committee shall be authorized to act on behalf of the Board of Directors with respect to the membership approval process. The actions of the Executive Committee are subject to ratification by the full Board of Directors.
Section 2. Nominating Committee. The Nominating Committee shall consist of five (5) members. The Second Past-President shall serve as chair. The other four (4) members of the Nominating Committee shall be elected at the annual meeting, and all members shall serve for one (1) year. They shall nominate at the next annual meeting a Second President-Elect, Secretary-Treasurer, Librarian-Historian, Members-at-Large of the Board of Directors, members of the Membership Committee.

Section 3. Finance Committee. The Finance Committee shall consist of the Secretary-Treasurer as Chair, the President, the Immediate Past President and an at-large delegate, appointed by the President every other year, who will serve a two (2) year term. The Finance Committee shall recommend investment policies for the Society and shall, subject to the direction and control of the Board of Directors, manage, supervise and control the financial affairs and policies of the Society.

Section 4. Publication Committee. The Publication Committee shall consist of three (3) members who will serve three (3) year staggered terms. The President will appoint a new member each year. The senior member of the Publication Committee shall be the Chairman in his or her final year. The Publication Committee has the responsibility of preparing and submitting the abstracts of the annual meeting for publication in Orthopaedic Transactions. The outgoing Program Chairman and the editor of The Journal shall serve as ex-officio members of the Committee, without vote.

Section 5. Continuing Medical Education Committee. The Continuing Medical Education Committee will consist of five (5) members: the Immediate Past President, the First President Elect, the immediate Past General Chairman of the annual meeting and the General Chairmen of next two (2) following meetings. The President shall appoint the new General Chairman each year.

Section 6. Membership Committee. The Membership Committee shall consist of six (6) members. Two (2) of such members shall consist of the First President Elect and the Second President Elect. The other four (4) of such members shall be elected two (2) each year for a two (2) year staggered term. The membership committee shall be responsible for initial approval of new members pursuant to Article II of these Bylaws. The First President Elect shall serve as Chairman.

Section 7. Elmer Nix Ethics Award Committee. The Elmer Nix Ethics Award Committee shall consist of three (3) members selected by the nominating committee to serve a one-year term. The committee will meet via conference call or at the annual meeting to select a recipient who represents the concept of ethical behavior in the profession of Orthopaedic Surgery. Members of the COS may be solicited for candidate names. The candidate should be an Orthopaedic Surgeon. The committee will forward their selection to the Executive Committee for approval and Dr. Elmer Nix for review. The Chairman of the Committee will notify selected candidate after the above approval. The Recipient will be expected to attend the annual meeting and receive an appropriate plaque and honorarium of $500.

Section 8. Bylaws Committee. The Bylaws Committee shall be chaired by the Librarian-Historian and shall consist of two (2) other members appointed by the President who shall serve
staggered two (2) year terms.

Section 9. Ad Hoc Committees. The President, with consent from the Board of Directors, may appoint ad hoc committees to function for up to three (3) years. If an ad hoc committee is still functioning after three (3) years of continuous service, the Board of Directors may, with ratification of the membership, convert the ad hoc committee to a standing committee. The size and membership of the committee will be determined by the Board of Directors, and the President shall make appointments to the committee in a manner similar to other standing committees.

Section 10. Resident Paper Award Committee. The Resident Paper Award Committee shall consist of four (4) members appointed by the President to serve staggered four (4) year terms. Up to two (2) awards may be given each year.

Section 11. Traveling Fellowship Committee. The traveling fellowship committee shall consist of three (3) members. Each member is selected by the president to serve a term of three (3) years. The terms will be staggered at one (1) year intervals. The function of the committee shall be to select an orthopaedic surgeon to receive the award. The term of the fellowship is one year. The committee shall establish guidelines for the award and outline the responsibilities of the awardees.

Section 12. Reports. All standing committees are required to submit a written report at the annual meeting.

Section 13. Committee Removal and Vacancies. A committee member appointed by the President may be removed by the President, a committee member appointed by the Board of Directors may be removed by the Board of Directors, and a committee member elected by the members may be removed by the members, each with or without cause. Vacancies shall be filled as specified in Article IV, Section 2.

Section 14. Committee Action. Each committee and member thereof shall be subject to the requirements of Sections 2 through 9 of Article III in the same manner as the Board of Directors and each member thereof.

ARTICLE VI

Elections
At the business meeting at each annual meeting the Nominating Committee will suggest a slate of names for consideration. Nominations for all positions will be accepted from the floor. The elected positions include the Second President-Elect, Secretary-Treasurer, Librarian-Historian, two (2) members of the Membership Committee, one (1) Member-at-Large to the Board of Directors, two (2) members of the Planning and Development Committee and four (4) members of the Nominating Committee. A majority vote of the membership present and voting will be required to elect a candidate. If no majority is achieved for a particular office, the candidate receiving the least number of votes is dropped and the vote retaken. The procedure is repeated until one candidate wins a majority.
ARTICLE VII
Dues
The initial and annual dues for each category of membership of the Society, the time for paying such dues, and other fees and assessments, shall be determined from time to time by the Board of Directors. Annual dues are not refundable.

ARTICLE VIII
Resignation & Delinquency
Section 1. Resignation. Any member may resign at will by presenting his or her resignation in writing to the Secretary, who shall report such resignation at the next meeting.

Section 2. Nonpayment of Dues. Dues paying members shall be removed at the discretion of the Board of Directors for non-payment of dues, fees or assessments, after thirty (30) days from the date of notice sent to the last known address of the member. Dues, fees and assessments are delinquent if not paid by May 1 providing three dues notices have been sent by regular mail. The former member may reapply for membership under that procedure specified in Article II, Section 6 once all past dues have been paid.

ARTICLE IX
Guests
Guests shall be limited to members of the medical profession whom the Meeting Committee may wish to invite and to distinguished guests of the President.

ARTICLE X
Amendments to the Bylaws
These Bylaws may be altered, amended or repealed, and new and other Bylaws may be made and adopted at any regular or special meeting of the membership, provided the proposed changes have been circulated to the membership at least one (1) month before the meeting at which they are to be changed.

ARTICLE XI
Books and Records
The Society shall keep correct and complete books and records of account and shall also keep minutes of the proceedings of its members, Board of Directors, and committees having any of the authority of the Board of Directors, and shall keep at the registered or principle office a record giving the names and addresses of the members entitled to vote. All books and records of the Society may be inspected by any member, or his or her agent or attorney, for any proper purpose at any reasonable time.

ARTICLE XII
Contracts Checks, Deposits and Funds, Bonding
Section 1. Contracts. The Board of Directors may authorize any officer, officers, agent or agents of the Society, in addition to the officers so authorized by these Bylaws, to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Society and such authority may be general or confined to specific instances. Unless so authorized by the Board of Directors, no officer, agent or employee shall have any power to bind the Society or to render it liable for any purpose or amount.
Section 2. Depositories. All funds of the Society not otherwise employed shall be deposited from time to time to the credit of the Society in such banks, trust companies or other depository as the Board of Directors may designate. Such designation may be general or confined to specific instances.

Section 3. Checks, Drafts, Notes, Etc. All checks, drafts of other orders for the payment of money and all notes or other evidences of indebtedness issued in the name of the Society shall be signed by such officer or officers, or agents, of the Society and in such manner as shall from time to time be determined by resolution of the Board of Directors. The designation of such person or persons may be general or confined to specific instances.

Section 4. Bonding. The Board of Directors shall provide for the bonding of such officers and employees of the Society as it may from time to time determine.

Section 5. Delivery of Notice. Any notices required to be delivered pursuant to these Bylaws shall be deemed to be delivered when transferred or presented in person or deposited in the U.S. mail addressed to the person at his, her or its address as it appears on the records of the Society, with sufficient first-class postage prepaid thereon.

Section 6. Investments. Unless otherwise specified by the terms of a particular gift, bequest, devise, grant or other instrument, the funds of the Society may be invested, from time to time, in such manner as the Board of Directors may deem advantageous without regard to restrictions applicable to directors of trust funds.

Section 7. Loans. Unless authorized by the Board of Directors, no loan shall be made by or contracted for on behalf of the Society and no evidence of indebtedness shall be issued in its name. Such authorization may be general or confined to specific instances.

Section 8. Gifts. The Board of Directors may accept on behalf of the Society any gift, bequest, devise, or other contribution for the purposes of the Society on such terms and conditions, as the Board of Directors shall determine.

ARTICLE XIII
Indemnification

Section 1. Indemnification by the Society. To the extent not inconsistent with applicable law, every person (and the heirs and personal representatives of such person) who is or was a director, officer, member, employee, or agent of the Society shall be indemnified by the Society against all liability and reasonable expense that may be incurred by her or him in connection with or resulting from any claim, action, suit or proceeding (a) if such person is wholly successful with respect thereto or, (b) if not wholly successful, then if such person is determined as provided in Section 3 of this Article XIII to have acted in good faith, in what he or she reasonably believed to be the best interests of the Society (or, in any case not involving the persons official capacity with the Society, in what he or she reasonably believed to be not opposed to the best interest of the Society) and, in addition, with respect to any criminal action or proceeding, is determined to have had reasonable cause to believe that her or his conduct was lawful (or no reasonable cause to believe that the conduct was unlawful). The termination of any claim, action, suit, or proceeding, civil or criminal, by judgment, order,
settlement (whether with or without court approval), or conviction or upon a plea of guilty or of nolo contendere or its equivalent, shall not create a presumption that a person did not meet the standards of conduct set forth in this Article XIII.

Section 2. Definitions.

(a) As used in this Article XIII, the term “claim, action, suit, or proceeding” shall include any threatened, pending, or completed claim, action, suit, or proceeding and all appeals thereof (whether brought by or in the right of the Society, any other corporation, or otherwise), whether civil, criminal, administrative, or investigative, or a thread thereof and whether formal or informal, in which a person (or her or his heirs or personal representatives) may become involved, as a party or otherwise:

(i) By reason of her or his being or having been a director, officer, member, employee, or agent of the Society or of any corporation where he or she served as such at the request of the Society, or

(ii) By reason of her or his acting or having acted in any capacity in a corporation, partnership, joint venture, association, trust, or other organization or entity where he or she served as such at the request of the Society, or

(iii) By reason of any action taken or not taken by her or him in any such capacity, whether or not he or she continues in such capacity at the time such liability or expense shall have been incurred.

(b) As used in this Article XIII, the terms “liability” and “expense” shall include, but shall not be limited to, counsel fees and disbursements and amounts of judgments, fines, or penalties against, and amounts paid in settlement by or on behalf of, a person.

(c) As used in this Article XIII, the term “wholly successful” shall mean (i) termination of any action, suit, or proceeding against the person in question without any finding of liability or guilt against he or him, (ii) approval by a court, with knowledge of the indemnity herein provided, or a settlement of any action, suit, or proceeding, or (iii) the expiration of a reasonable period of time after the making of any claim or threat of any action, suit, or proceeding without the institution of the same, without any payment or promise made to induce a settlement.

Section 3. Entitlement to Indemnification. Every person claiming indemnification hereunder (other than one who has been wholly successful with respect to any claim, action, suit, or proceeding) shall be entitled to indemnification (a) if special independent legal counsel, which may be regular counsel of the Society or other disinterested person or persons, in either case selected by the Board of Directors, whether or not a disinterested quorum exists (such counsel or person or persons being hereinafter called the “referee”), shall deliver to the Society a written finding that such person has met the standards of conduct set forth in the preceding Section 1 of this Article XIII and (b) if the Board of Directors, acting upon such written finding, so determines. The person claiming indemnification shall, if requested, appear before the referee and answer questions, which the referee deems relevant and shall be given ample opportunity to present to the referee evidence upon which he or she relies
for indemnification. The Society shall, at the request of the referee, make available facts, opinions, or other evidence in any way relevant to the referee's findings that are within the possession or control of the Society.

Section 4. Relationship to Other Rights. The right of indemnification provided in this Article XIII shall be in addition to any rights to which any person may otherwise be entitled.

Section 5. Extent of Indemnification. Irrespective of the provisions of this Article XIII, the Board of Directors may, at any time and from time to time, approve indemnification of the Society's directors, officers, members, employees, agents, or other persons to the fullest extent permitted by applicable law, or, if not permitted, then to any extent not prohibited by such law, whether on account of past or future transactions.

Section 6. Advancement of Expenses. Expenses incurred with respect to any claim, action, suit, or proceeding may be advanced by the Society (by action of the Board of Directors, whether or not a disinterested quorum exists) prior to the final disposition thereof upon receipt of an undertaking by or on behalf of the recipient to repay such amount unless he or she is entitled to indemnification.

Section 7. Purchase of Insurance. The Board of Directors is authorized and empowered to purchase insurance covering the Society's liabilities and obligations under this Article XIII and insurance protecting the Society's directors, officers, members, employees, agents, or other persons.

ARTICLE XIV
Dissolution

In the event of dissolution or final liquidation of the Society, all of its assets remaining after payment of its obligations have been made and provided for shall be distributed to and among such corporations, foundations, or other organizations operated exclusively for scientific and educational purposes consistent with those of the Society. This distribution shall be designated by the Board of Directors.

Revised March 2007
PRODUCT DESCRIPTIONS

Angiotech
The Quill™ Knotless Tissue-Closure is a double-armed bidirectional barbed suture designed to evenly distribute tension along the closure and eliminate the need to tie knots.”

Angiotech/Quill™
www.AngioEduPRO.com/Quill

Biocomposites, Inc.

Biomet Orthopaedics
Biomet, Inc. and its subsidiaries design, manufacture and market products used primarily by musculoskeletal medical specialists. Biomet's product portfolio includes orthopedic joint reconstructive products, dental implants, spinal products, fixation devices, and sports medicine products, as well as biologics. Headquartered in Warsaw, Indiana, Biomet currently distributes products in approximately 90 countries.

CeramTec
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. Every 30 seconds a Biolox® component is surgically implanted around the world.

DePuy Orthopaedics

Elsevier USA

Hapad, Inc
Hapad, Inc. is a leading manufacturer of 100% natural wool felt foot products and sports replacement insoles used for conservative management of common, painful foot complaints. Stop by our booth for a free professional sample.

Janssen Pharmaceuticals

MAKO Surgical Corp.
MAKO Surgical Corp.® is proud to support surgeons’ efforts to restore patient mobility and lifestyle by offering a robotic arm technology called MAKOplasty® for total hip and partial knee surgery.

McKesson
McKesson's Physician Practice Solutions division is dedicated to strengthening the vitality of physician practices through the delivery of industry-leading electronic health record (EHR) and practice management solutions. McKesson's EHR solutions include Practice Partner®, Medisoft® Clinical, Lytec® MD and latest addition, McKesson Practice Choice™, a web-based EHR and practice management system.
Medstrat
Medstrat is a leading developer of FDA-approved orthopedic multi-platform PACS and imaging solutions. We aim to meet the unique needs of the orthopedic surgeon and address the demanding challenges orthopedic surgeons face every day, including the pressure to reduce costs and deliver faster, higher-quality patient care. Based upon a proven, high-performing digital medical imaging platform, Medstrat allows for the elimination of film, chemicals, and processing; increases workflow efficiency and staff productivity; and provides significant cost savings. www.medstrat.com.

Medtronic Advanced Energy

Nutramax Laboratories, Inc.
Nutramax Laboratories, Inc. researches, develops, manufactures and markets products that improve the quality of life for people and their pets. We manufacture safe and effective products using high-quality, researched ingredients following quality manufacturing standards for all of our products. Cosamin® joint health supplement is the #1 brand recommended by Orthopedic Specialists.

Orthopaedic Research and Education Foundation

ProScan Reading Services
ProScan Reading Services: Tele-radiology for your Practice- Fellowship Trained MSK MRI Radiologists- Getting the quality and economics right!

Shriners Hospitals for Children
Shriners Hospitals for Children® – Chicago is an acclaimed pediatric specialty hospital that provides the highest quality orthopedic surgery, plastic surgery, rehabilitation services, and spinal cord injury care in a compassionate, family-centered environment. Located near the historic Oak Park neighborhood, Shriners Hospital in Chicago is part of a unique system of pediatric facilities across North America, dedicated to improving the lives of children by providing pediatric specialty care, innovative research and outstanding teaching programs for medical professionals. Children up to age 18 are eligible for care at Shriners Hospitals, regardless of the families’ ability to pay. For more information, please visit www.shrinershospitalsforchildren.org

Smith & Nephew
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 a range of other medical devices to help alleviate pain in joints and promote healing. Visit www.smith-nephew.com for more information.

SRSsoft
SRS is the recognized leader in productivity-enhancing EHR technology for orthopaedic specialists, with an unparalleled adoption rate. The SRS EHR, SRS 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
Stryker is one of the world’s leading medical technology companies and is dedicated to helping healthcare professionals perform their jobs more efficiently while enhancing patient care. The Company offers a diverse array of innovative medical technologies, including reconstructive, trauma, medical and surgical, and neurotechnology and spine products to help people lead more active and more satisfying lives.

Zimmer Daniel