

CURRICULUM VITAE

Paul J. Slosar, Jr., M.D.

SpineCare Medical Group
San Francisco Spine Institute
455 Hickey Boulevard #310
Daly City, CA 94015
650-985-7500

- CERTIFICATION**
- Diplomate, National Board of Medical Examiners (1989)
 - Diplomate, American Board of Orthopaedic Surgery (1996)
 - Charter Diplomate, American Board of Spinal Surgery (1998)

- LICENSURE**
- California (1993-present)
 - Illinois (1989-1995)

PROFESSIONAL TRAINING

- 1993-1994 Spine Surgery Fellowship
The San Francisco Spine Institute/SpineCare Medical Group
- 1989-1993 Orthopaedic Surgery Residency
Loyola University Medical Center, Maywood, Illinois
- 1988-1989 General Surgery Internship
Loyola University Medical Center, Maywood, Illinois

EDUCATION

- 1984-1988 Doctor of Medicine
AOA Medical Honor Society
Rush University Medical College, Chicago, Illinois
- 1980-1984 Bachelor of Science, Physiology
University of Illinois, Champaign, Illinois

PERSONAL

Birthplace: Evergreen Park, Illinois

- EMPLOYMENT**
- 1994 - 1997 Midland Orthopaedic Associates
Chicago, IL
 - 1997 - Present SpineCare Medical Group
Daly City, CA

HOSPITAL AFFILIATIONS

Mills-Peninsula Health Services
1783 El Camino Real
Burlingame, CA 94010

Presidio Surgery Center
1635 Divisadero Street, Suite 200
San Francisco, CA 94115

Saint Francis Memorial Hospital
900 Hyde Street
San Francisco, CA 94109

Seton Medical Center
1900 Sullivan Avenue
Daly City, CA 94015

California Pacific Medical Center
2333 Buchanan Street
San Francisco, CA 94115

University of California San Francisco
505 Parnassus Avenue
San Francisco, CA 94143

APPOINTMENTS

- President
 SpineCare Medical Group (2007-present)
- Medical Director
 Spine Care Institute of San Francisco (2009-present)
- Assistant Director, Surgical Fellowship
 The San Francisco Spine Institute (1998-2012)
- Assistant Director, Surgical Research
 The San Francisco Spine Institute (1998-present)
- Board of Directors
 The American Board of Spine Surgery (2005-present)
- Board of Directors
 The Spinal Research Foundation (2012-present)
- Board of Directors
 Saint Francis Foundation (2012-present)
- Oral Board Examiner
 The American Board of Orthopaedic Surgery (2005-present)
- Oral Board Examiner
 The American Board of Spine Surgery (2008-present)
- Expert Reviewer/ Spine Surgery
 The Medical Board of California (2004-present)
- Reviewer Board Member
 Spine (2001-present)
- Editorial Board Member
 Spinal Research Foundation (2007-present)
- Medical Executive Committee
 Presidio Surgery Center (2008- present)

- Editorial Board Member
The Spine Journal (2001-2009)
- Editorial Board Member
Spine Line (2000-2009)
- Editorial Advisory Board Member
Orthopedic Technology Review (2002-2007)
- Executive Committee/Western U.S. Representative
International Society for the Study of the Lumbar Spine (2004-2007)
- Research Project Management Committee
North American Spine Society (2000-2004)
- PGA Tour Event Medical Staff
The Presidents Cup; Harding Park, San Francisco 2009
- Champions Tour event Medical Staff
Charles Schwab Cup Championship; Harding Park, San Francisco 2011
- PGA Tour Event Medical Staff
US Open Championship; Olympic Club; San Francisco 2012

AWARDS

Top Doctor Orthopedic Spine Surgery 2013, 2014, 2015, 2016, 2017;
Castle Connolly/ US News and World Report®

Best Basic Science Paper (Whitecloud Award) 2014; *Scoliosis Research Society International Meeting on Advanced Spine Techniques (IMAST), 2014.*

Healthcare Leadership Award 2014; *Becker's Orthopedic and Spine Review*

San Francisco Super Doctors 2012/ 2013; *Super Doctors Key Professional Media*

Top 100 Spine Surgeons US; *Becker's Orthopedic and Spine Review, 2011*

Center of Excellence Award: San Francisco Spine Institute; *Spinal Research Foundation, 2009*

Outstanding Poster Award: *The Spinal Arthroplasty Society, 2008*

Outstanding Poster Award; *North American Spine Society, 1998*

Berkheiser Award for Outstanding Research in Orthopaedics; *The Institute of Medicine of Chicago, 1993*

Outstanding Paper: Residency Trauma Paper Competition; *American College of Surgeons, 1992*

PROFESSIONAL SOCIETY MEMBERSHIPS

- International Society for the Study of the Lumbar Spine
- North American Spine Society American
- Academy of Orthopaedic Surgeons
- American College of Spinal Surgery
- Society for Minimally Invasive Spinal Surgery
- International Society for the Advancement of Spinal Surgery
- AO Spine International
- Spinal Research Foundation
- Society of Lateral Access Surgeons
- California Orthopaedic Association
- California Medical Association
- San Mateo County Medical Association
- Alpha Omega Alpha Medical Honor Society

BIBLIOGRAPHY

PUBLICATIONS: ORIGINAL ARTICLES (Peer-Reviewed Journals)

1. Pinzur M, Slosar PJ. Functional Outcome: Through Knee Amputation in Peripheral Vascular Insufficiency. *Contemporary Orthopaedics*; 24 (2):157-160, 1992
2. Patwardhan A, Slosar PJ, Gavin T. Stabilization of Fractures of the Thoracolumbar Spine. *Spine: State of the Art Reviews.* May 1993
3. Slosar PJ, Patwardhan A, Lorenz M, Havey R, Sartori M. Instability of the Lumbar Burst Fracture and Limitations of Transpedicular Instrumentation. *Spine*; 20 (13) 1453-1461, 1998
4. Slosar PJ, White AH. Controversy: The Utility of Selective Nerve Root Blocks: Diagnostic, Therapeutic, or Placebo? *Spine*; 23 (20) 2253-2254, 1998
5. Slosar PJ, Reynolds JB, Schofferman JA, Goldthwaite ND, White AH. Patient Satisfaction After Circumferential Lumbar Fusion. *Spine*; 25 (6) 722-726, 2000
6. Slosar PJ, Reynolds JB, Koestler M. The Axial Cage: A Pilot Study for Interbody Fusion in Higher-Grade Spondylolisthesis. *The Spine Journal*; 1 (2) 115-120, 2001
7. Schofferman J, Slosar PJ, Reynolds J, Goldthwaite N, White A, Koestler M. The “270°” Lumbar Fusion: An Alternative to the Circumferential Fusion. *Spine*; May 15, 2001

8. Waguespack A, Schofferman J, Slosar P, Reynolds J. Etiology of Long-term Failures of Lumbar Spine Surgery. *Pain Medicine*; 3 (1) 18-22, 2002
9. Slosar PJ. Indications and Outcomes of Reconstructive Surgery in Chronic Pain of Spinal Origin. *Spine*; 27 (22S), 2002
10. Slosar PJ, Perkins RB, Snook D. Effects of Cigarette Smoking on the Spine: A Focused Review. *SpineLine*; 3 (5) 6-9, 2002.
11. Brodke DS, Slosar PJ, Youssef JA. Collaborative Knowledge Networks Part 1: A new approach to Clinical Decision-making and the Use of Evidence-based Medicine. *SpineLine*; July/ August 28-30. 2005.
12. Slosar PJ, Brodke DS, Youssef JA. A Survey of Internet-Based Collaborative Tools: Facilitating Knowledge Transfer, Creativity, and Problem Solving for the Spine Community. *SpineLine*; November/ December 2005.
13. Slosar PJ. Cervical Spondylotic Myelopathy *Orthopedic Technology Review*; July/ August 2006.
14. Slosar PJ, Josey R, Reynolds J. Accelerating Lumbar Fusions by Combining rhBMP-2 with Allograft Bone: A Prospective Analysis of Interbody Fusion Rates and Clinical Outcomes. *The Spine Journal*; (7) 301-307, 2007.
15. Schofferman J, Bogduk N, Slosar PJ. Chronic Whiplash and Whiplash Associated Disorders. *Journal of the American Academy of Orthopedic Surgery*; September 2007.
16. Slosar PJ. Minimally Invasive Spine Surgery; An Evolution in Progress. *Journal of The Spinal Research Foundation*; Volume 5 (1) Spring 2010.
17. Burkus JK, Gornet M, Glassman SD, Slosar PJ, et al. Blood Serum Antibody Analysis and Long-Term Follow-up of Patients Treated with Recombinant Human Bone Morphogenetic Protein-2 in the Lumbar Spine. *Spine*; (36) 2158-2167; December 2011.
18. Slosar PJ, Marrero LG. Unilateral Cervical Facet Fracture: A Case Report and Review of the Literature. *Journal of The Spinal Research Foundation*; Volume 6 (2) Fall 2011.
19. Subach BR, Schuler TC, McLaughlin MR, Slosar PJ, Comey CH, Thomas NM; Discogenic Lumbar Disease: Editorial. *Advances in Orthopedics*; Volume 2012, Article ID 351714

20. Phillips FM, Slosar PJ, Youssef JA, Anderson G, Papatheofanis F. Lumbar spine fusion for chronic low back pain due to degenerative disc disease; a systematic review. *Spine* (38) E409-422; April, 2013
21. Olivares-Navarrete R, Hyzy SL, Gittens RA, Schneider JM, Haithcock DA, Ullrich PF, Slosar PJ, Boyan BD. Rough titanium alloys regulate osteoblastic production of angiogenic factors. *The Spine Journal*; 13; 1563-1570; 2013
22. Slosar, PJ, Kaiser J, Marrero L, Sacco D. Interobserver Agreement using CT Scans to Assess Radiographic Fusion Criteria with a Unique Titanium Interbody Device. *American Journal of Orthopedics*; February, 2015
23. Olivares-Navarrete R, Hyzy SL, Slosar PJ, Schneider JM, Schwartz Z, Boyan BD. Implant Materials Generate Different Peri-implant Inflammatory Factors: PEEK Promotes Fibrosis and Micro-textured Titanium Promotes Osteogenic Factors. *Spine*; 40 (6) 399-404; 15 March 2015

PUBLICATIONS: TEXTBOOK CHAPTERS

1. Slosar PJ, Reynolds JB. Degenerative Spondylolisthesis. In: White AH, (editor) *Spine Care* St. Louis, Mosby-Year Book, 1995
2. Reynolds JB, Slosar PJ. Isthmic Spondylolisthesis. In: White AH, (editor) *Spine Care* St. Louis, Mosby-Year Book, 1995
3. Slosar PJ. Sport-Specific Rehabilitation: Ice Hockey. In: White AH, (editor) *Spine Care* St. Louis, Mosby-Year Book, 1995
4. Slosar PJ. Sport-Specific Rehabilitation: Snow Skiing. In: White AH, (editor) *Spine Care* St. Louis, Mosby-Year Book, 1995
5. Slosar PJ, Scott J. Lumbar Spine Fusions. In Maxey L. and Magnusson J, (editors) *Rehabilitation of the Post-Surgical Patient: Procedures and Protocols* St. Louis, Mosby-Year Book, 1998
6. Izu CH, Plock HV, Scott J, Slosar PJ, Cabalo A. Lumbar Spine Fusion. In Maxey L. and Magnusson J, (editors) *Rehabilitation for the Post-Surgical Orthopedic Patient.* St. Louis, Elsevier, 2013

PRESENTATIONS: ORIGINAL RESEARCH

1. Slosar P, Patwardhan A, Lorenz M, Havey R, Sartori M: Three-Dimensional Instability Patterns of the Thoracolumbar Burst Fracture. *International Society for the Study of the Lumbar Spine*; Chicago, IL; May 1992 / Orthopaedic Research Society; Washington, DC; February 1992 / ASME Bioengineering Symposium; Atlanta, GA; 1991.
2. Slosar P, Patwardhan A, Lorenz M, Havey R, Sartori M: Three-Dimensional Instability of the L1 Burst Fracture: A Comparison of 2-Column and 3 Column Injuries. *Harold A. Sofield Lectureship*; Shriner's Hospital for Crippled Children, Chicago Unit; November 1992 / Scoliosis Research Society; Kansas City, KS; 1992.
3. Slosar P, Patwardhan A, Lorenz M, Havey R, Sartori M: Instability of the L1 Burst Fracture: A Comparison of Two-column and Three-column Injuries Stabilized with Pedicular Screw Fixation. *ASME Bioengineering Symposium*; Breckenridge, CO; 1993
4. Slosar P, Schofferman J, White A, Reynolds J, Goldthwaite N: Does Discography Have a Role in the Surgical Decision Making Process? *North American Spine Society*; Minneapolis, MN; 1994.
5. Slosar P, Reynolds J, Schofferman J, Goldthwaite N, White A: Combined Anterior and Posterolateral Lumbar Fusions: Primary and Revision Procedures. *North American Spine Society*; Minneapolis, MN; 1994.
6. Slosar P, Schofferman J, Reynolds J, Goldthwaite N, Koestler M: The "270" Lumbar Fusion: An Alternative to Circumferential Fusion. *North American Spine Society*; San Francisco, CA; 1998.
7. Brown A, Slosar P, Reynolds J, Schofferman J, Koestler M: Paired BAK™ Proximity Cages Versus Standard BAK™ Subsidence and Clinical Failures. *North American Spine Society*; Chicago, IL; 1999.
8. Schofferman J, Slosar P, Reynolds J, Goldthwaite N, Koestler M: Anterior Lumbar Interbody Fusion: Prospective Randomized Comparison of Titanium Threaded Cages with Threaded Bone Dowels. *North American Spine Society*; Chicago, IL; 1999.
9. Slosar PJ, Schofferman J, Reynolds J, Goldthwaite N, Koestler M: The "270" Lumbar Fusion: An Alternative to the Circumferential Fusion. *North American Spine Society*; New Orleans, LA; 2001.

10. Slosar PJ, Naraghi F, Reynolds J, Goldthwaite N: Foraminal Stenosis: A Useful Marker Associated with Pseudarthrosis After Anterior Lumbar Interbody Fusion. *American Academy of Orthopaedic Surgeons*; San Francisco, CA; 2001.
11. Slosar PJ, Schofferman J, Reynolds J, Goldthwaite N, Koestler M: The “270° Fusion”: An Alternative to the “360° Fusion” (Circumferential Fusion). *International Society for the Study of the Lumbar Spine Annual Meeting*; Edinburgh, Scotland; 2001.
12. Slosar PJ, Reynolds, J, Koestler M: The Axial Cage: An Alternative to the Fibula Strut-Graft in Spondylolisthesis. *The International Society for the Study of the Lumbar Spine Annual Meeting*; Edinburgh, Scotland; 2001.
13. Verst D, Slosar PJ, Schofferman J, Reynolds J. LT™ Cage vs. BAK™ Cage for L5-S1 ALIF. *The International Society for the Study of the Lumbar Spine Annual Meeting*; Cleveland, OH; 2002.
14. Reynolds J, Verst D, Slosar P, Goldthwaite N, Koestler M, Libby E, Nagle M. Pre-emptive Analgesia Reduces Immediate Postoperative Pain. *The North American Spine Society Annual Meeting*; Montreal, Quebec, Canada; 2002.
15. Herceg M, Slosar PJ, Reynolds JR, Schofferman, J. Rapid Subsidence in Lumbar Interbody Fusions with Resorbable Implants. *The North American Spine Society Annual Meeting*; Chicago, IL; 2004.
16. Snook D, Schofferman J, Slosar PJ, Reynolds J. Posterolateral Fusion with Transpedicular Instrumentation to Salvage Failed Anterior Lumbar Interbody Fusions with Cages. *The International Society for the Study of the Lumbar Spine*; New York, NY; 2005.
17. Slosar PJ, Herceg M, Reynolds JR, Josey R. Rapid Subsidence in Lumbar Interbody Fusions with Resorbable Implants. *The International Society for the Study of the Lumbar Spine*; New York, NY; 2005.
18. Slosar PJ, Josey R, Herceg M. Accelerated Lumbar Interbody Fusion Rates: A Comparison of Allograft Bone With and Without RH-BMP 2. *The International Society for the Study of the Lumbar Spine*; New York, NY; 2005.
19. Reynolds J, Slosar PJ, Steinke B, et al. Salvage Posterolateral Fusion for Failed Interbody Fusion with Titanium and Bone Cages. *The North American Spine Society*; Philadelphia, PA; 2005.
20. Slosar PJ, Josey R, Herceg M, Reynolds J. A Prospective Study with 2-year follow-up Comparing Allograft with and without rh-BMP 2. *The North American Spine Society*; Philadelphia, PA; 2005.

21. Sun EC, Reynolds J, Slosar PJ, Goldthwaite N. Assessment of Fusion Rates with rhBMP-2 and Resorbable Ceramic Granules in Posterolateral Spinal Fusion. *American Academy of Orthopaedic Surgeons*; Chicago, IL; 2006.
22. Sun EC, Reynolds J, Slosar PJ, Goldthwaite N. Assessment of Fusion Rates with rhBMP-2 and Resorbable Ceramic Granules in Posterolateral Spinal Fusion. *The North American Spine Society*; Seattle, WA; 2006.
23. Slosar PJ, Youssef J, Reynolds J, Patty C, Brodke D. The Emergence of Internet based Collaboration in Surgical Decision Making and New Technology Training. *The American Orthopaedic Association*; Quebec, Canada; 2008.
24. Youssef J, Slosar PJ, Reynolds J, Patty C, Brodke D. The Emergence of Internet based Collaboration in Surgical Decision Making and New Technology Training. *Spinal Arthroplasty Society Annual Meeting*; Miami, FL; 2008.
25. Slosar PJ, Youssef J, Reynolds J, Brodke D. The Emergence of Internet based Collaboration in Surgical Decision Making. *The International Society for the Study of the Lumbar Spine*; Geneva, Switzerland; 2008.
26. Burkus JK, Gornet MF, Glassman SD, Rosner MK, Slosar PJ, Deckey J. The Prevalence and Clinical Significance of Antibody formation in rhBMP-2 Spinal Fusion Studies. *The North American Spine Society*; Toronto, Canada; 2008.
27. Tromanhauser SG, Polly DW, Glassman SD, Slosar PJ, Bono, CM. Return to Work after Lumbar Fusion for Chronic Low Back Pain: Work Injured versus Non-Work Injured Patients. *The North American Spine Society*; Toronto, Canada; 2008.
28. Burkus JK, Gornet MF, Glassman SD, Rosner MK, Slosar PJ, Deckey J. The Prevalence and Clinical Significance of Antibody formation in rhBMP-2 Spinal Fusion Studies. *The American Academy of Orthopedic Surgeons*; Las Vegas, NV; 2009.
29. Pimenta L, McAfee P, Cappuccino A, Slosar P, et al. Treatment of Lumbar Spinal Stenosis with a Total Posterior Arthroplasty Prosthesis vs. Posterior Lumbar Fusion: A Prospective Report on 104 Patients. *Spinal Arthroplasty Society*; London, United Kingdom; May 2009.
30. Slosar PJ, Youssef J, Reynolds J, Brodke D. The Emergence of Internet based Collaboration in Surgical Decision Making. *AO Spine Global Spine Congress*; San Francisco, CA; June 2009.

31. Pimenta L, Hamzaoglu A, McAfee P, Hes R, Anekstein Y, Cappuccino A, Coric D, Comey C, Banco, R, Slosar P, et al. Treatment of Lumbar Spinal Stenosis with a Total Posterior Arthroplasty Prosthesis versus Posterior Lumbar Fusion: A Prospective Report on 145 Patients. *Spinal Arthroplasty Society*; New Orleans, USA; May 2010.
32. Slosar PJ, Reynolds JR, Caballo A. A Prospective Study of a Unique Lumbar Interbody Fusion Implant; Clinical and Radiographic Outcomes at 1 and 2 year follow-up. *Evidence and Technology Summit*; Park City, UT; 2012.
33. Phillips F, Slosar PJ, Youssef J, Andersson G, Papetheofanis F; Clinical Review of Lumbar Spine Fusion for Chronic Low Back Pain due to Degenerative Disc Disease. *IMAST*; Istanbul, Turkey; June 2012.
34. Slosar PJ, Cabalo AC, Reynolds JB; A Prospective Study of a Unique Titanium Interbody Fusion Implant; Clinical and Radiographic Outcomes at 1 and 2 year Follow-up. *ISSLS* ; Phoenix, AZ; 2013
35. Slosar PJ, Kaiser J, Marrero L, Sacco D; Interobserver Reliability of CT Scans to Assess Radiographic Fusion Criteria with a Novel Titanium Interbody Device. *ISSLS* ; Phoenix, AZ; 2013.
36. Slosar PJ, Cabalo AC, Reynolds JB; A Prospective Study of a Unique Titanium Interbody Fusion Implant; Clinical and Radiographic Outcomes at 1 and 2 year Follow-up. *ISASS* ; Vancouver, BC; 2013
37. Slosar PJ, Kaiser J, Marrero L, Sacco D; Interobserver Reliability of CT Scans to Assess Radiographic Fusion Criteria with a Novel Titanium Interbody Device. *ISASS* ; Vancouver, BC; 2013.
38. Navarrete RO; Hyzy S; Slosar PJ; Schneider J; Schwartz Z; Boyan, BD; Implant Materials Generate Different Peri-implant Inflammatory Factors: PEEK Promotes Fibrosis, Micro-textured Titanium Promotes Osteogenic Factors. *ISASS*; Miami, FL; 2014.
39. Navarrete RO; Hyzy S; Slosar PJ; Schneider J; Schwartz Z; Boyan, BD; Implant Materials Generate Different Peri-implant Inflammatory Factors: PEEK Promotes Fibrosis, Micro-textured Titanium Promotes Osteogenic Factors. *IMAST*, Valencia, Spain; 2014.
40. Boyan BD, Navarrete RO, Hyzy SL, Slosar PJ, Ullrich PF, Schwartz Z. Osteoblasts Secrete Pro-Inflammatory Cytokines on PEEK but Anti-Inflammatory Cytokines on Micro-structured Titanium. *NASS*; San Francisco, CA; 2014.

41. Silverstein J, Block J, Goldstein M, DeWal H, Zook J, Slosar P, et al. Femoral Nerve Protection During Lateral Lumbar Interbody Fusion. *ISASS*; Las Vegas, NV; 2017.

INVITED LECTURES/ GRAND ROUNDS/ EDITORIALS

1. Living Better With Back Pain: A Multidisciplinary Approach. LaGrange Memorial Hospital; LaGrange, IL. September 1995
2. Isthmic Spondylolisthesis. Pediatric Grand Rounds: Mercy Hospital and Medical Center; Chicago, IL. November 1995.
3. The Era of Ortho-Biological Surgery. Guest Editorial: *Orthopedic Technology Review*. Vol. 4(5), 2002.
4. The Role of Bone Morphogenetic Protein in Spinal Fusions. American Academy of Orthopaedic Surgeons/ National Organization of Orthopaedic Nurses, Annual Meeting, San Francisco, CA. February 2004.
5. Emerging Technology Symposium: Motion Preservation Technology. The North American Spine Society Annual Meeting, Chicago, IL. October 2004
6. Non-operative Debates. The North American Spine Society Annual Meeting; Philadelphia, PA. September 2005
7. Pro-STOS: Summary and Implementation. Lumbar Spine Study Group, Charleston, SC. November, 2005.
8. Medical Treatment Issues Under Workers' Compensation Law. California Legislature: Senate Committee on Labor and Industrial Relations: Hon. Senator Richard Alarcon, Chairman. Sacramento, CA. May 3, 2006
9. Osteoporosis and Vertebral Compression Fractures. Department of Internal Medicine Grand Rounds; Seton Medical Center; Daly City, CA; May 2009.
10. Osteoporosis and Vertebral Compression Fractures. Medical Staff Meeting; Saint Francis Memorial Hospital; San Francisco, CA; May 2009
11. Disc Arthroplasty: Novel Lumbar Spine Symposium. AO Spine Global Spine Congress; San Francisco, CA; June 2009.
12. Patient-Reported Functional Outcomes: How to Collect and Report Risk-Adjusted Musculoskeletal Patient-Reported Functional Outcome Data in an Orthopaedic Practice in California. California Orthopaedic Association; June 2013.

13. Clinical and Radiographic Outcomes of Painful Lumbar Disc Degeneration Following Interbody Fusion. University of California San Francisco Spine Symposium; San Francisco, CA; 2013
14. Biologics and Basic Science: Advances in Spine Implant Surface Engineering. North American Spine Society Annual Meeting. San Francisco, CA; 2014
15. Avoiding Errors in Spine Surgery. International Society for the Advancement of Spinal Surgery. San Diego, CA; April 2015.
16. Advances In Surface Engineering of Spine Implants to Stimulate Biological Responses. Neurosciences Grand Rounds Texas Back Institute. Dallas, TX. March 2015.
17. Advances In Surface Engineering of Spine Implants to Stimulate Biological Responses. Georgia Neurosurgical Society Spring Meeting. May 2015.
18. Bundled Payments for Spine Surgery. Becker's Spine, Orthopedic and Pain Management Conference: The Future of Spine; Chicago, IL; June 2015.
19. Advances In Surface Engineering of Spine Implants to Stimulate Biological Responses. UCSD Grand Rounds Department of Orthopaedic Surgery. San Diego; July 2015.
20. Spine Surgery State of the Art: Separating Fact From Fiction. Arthritis Foundation Bone and Joint Expo. Burlingame, CA. October 2015.
21. Implant Surface Technology: Material and Topography Influences Biochemical Responses. Selby Spine Course; Foundation for Orthopaedic Research and Education. Park City, UT. January 2016.
22. Spine Implant Nano-technology: The Regulatory and Scientific Landscape. Cedars Sinai Symposium on Current Concepts in Spinal Disorders; Las Vegas, NV; February 2016.
21. Spine Implant Nano-technology: The Regulatory and Scientific Landscape. State of the Art Spine Surgery: A Think Tank; Los Cabos, Mexico; June 2016.
22. Spine Implant Nano-technology: Superior Cellular Responses, No Impact Wear Debris, Exclusive FDA Clearance. North American Spine Society Emerging Technologies Symposium; Boston, MA; October 2016.
23. Bundled Payments: The Landscape for Spine Surgeons. Grand Rounds; Cedars-Sinai Medical Center; Los Angeles, CA; November 2016.

24. Advances in Surface Engineering of Spine Implants to Stimulate Biological Responses. 6th International Congress on Biotechnologies for Spinal Surgery; Berlin, Germany; April 2017.
25. Spine Implant Surface Technology: State of the Art/ Separating Fact From Fiction. Annual Musculoskeletal Education and Research Center Symposium; Philadelphia, PA. August 2017.

COURSE FACULTY APPOINTMENTS

1. Arthroscopic Microdiscectomy: Minimally Invasive Spinal Surgery; The San Francisco Spine Institute; San Francisco, CA. June 1994.
2. American Academy of Orthopaedic Surgery Instructional Course: Minimally Invasive Spinal Surgery; San Francisco, CA. 1997.
3. Least Invasive Spine Surgery. AAOS CME; St. Louis, MO. April 1999.
4. Open and Minimally Invasive Surgery of the Lumbar Spine. Barrows Neurological Institute; Phoenix, AZ. October 1999.
5. Current Techniques in Lumbo-sacral Fixation: Minimizing Complications in Spine Surgery. San Francisco, CA. April 2000.
6. Minimally Invasive Spine Surgery. American Academy of Orthopedic Surgeons CME; St. Louis, MO. July 2000.
7. Non-Threaded Innovations in Lumbar Interbody Fusion. Santa Fe, NM. August 2000.
8. Interbody Fusion Concepts Focus Group. Tucson, AZ. February 2001.
9. Summer Think Tank / Young Surgeon Focus Group. Sun River, OR. August 2001.
10. Interbody Fusion Concepts Focus Group. Sonoma, CA, February 2002.
11. Summer Think Tank / Young Surgeon Focus Group. Sun River, OR. July 2002.
12. Fundamentals and Techniques in Spinal Surgery. San Diego, CA. September 2002.
13. Interbody Fusion Technology (**Chairman**). Squaw Creek, CA. January 2003.

14. Advanced Techniques in Spinal Surgery. Memphis, TN. February 2003.
15. Emerging Technologies Focus Group. Amelia Island, FL. May 2003.
16. Identifying New Technologies and Techniques for Lumbar Interbody Fusions. Santa Fe, NM. July 2003
17. Summer Think Tank / Young Surgeon Focus Group (**Chairman**). Sun River, OR. August 2003
18. Current Concepts in Lumbar Degenerative Disc Disease (**Chairman**). Scottsdale, AZ. September 2003
19. Spine + Science + Management. New Orleans, LA. November 2003.
20. Spine Surgery Fellowship Program (**Chairman**). Memphis, TN. February 2004.
26. Spine + Science + Management. New Orleans, LA. November 2004.
27. Emerging Technologies in Spine Surgery. Whistler, B.C. January 2005.
28. Global Spine: Spinal Motion, Fusion and Realignment. San Francisco, CA. June 2005.
29. Collaborative Knowledge Network. North American Spine Society; Philadelphia, PA. September 2005.
30. Non-operative Debates. North American Spine Society; Philadelphia, PA. September 2005.
31. Artificial Disc Revision Training (**Chairman**). Henderson, NV, November 2005.
32. Spine + Science + Management. Henderson, NV, November 2005.
33. Spinal Biologics Technology Focus Group. Atlanta, GA, May 2005.
34. Emerging Technologies in the Management of Spinal Disorders: An Evidence-based Approach to the Evaluation of New Technologies. UCSF, San Francisco, CA. May 2006.
35. Spine + Science + Management. (**Chairman**) New Orleans, LA. November 2006.
36. The Art and Science of Total Facet Joint Repair. Austin TX, October 2007.
37. Spine + Science + Management. (**Chairman**) New Orleans, LA. November 2007.

38. Emerging Technologies Spine Education Summit. Jackson Hole, WY. February 2008
39. Spine + Science + Management. (**Chairman**) New Orleans, LA. November 2008
40. Spine + Science + Management. (**Chairman**) New Orleans, LA. November 2009
41. AO Spine Global Spine Congress; San Francisco, CA; June 2009
42. Spine + Science + Management. (**Chairman**) Henderson, NV. November 2010
43. International Society for the Advancement of Spinal Surgery, Spinal Advocacy Forum; Las Vegas, NV. March 2011
44. University of California San Francisco 8th Annual Spine Symposium; San Francisco, CA; June 2013
45. Selby Spine Conference; Foundation for Orthopaedic Research and Education; Park City, UT; February 2014
46. International Society for the Advancement of Spinal Surgery, (**Moderator**) Emerging Technologies Forum; Miami, FL. April 2014
47. Selby Spine Conference; Foundation for Orthopaedic Research and Education; Park City, UT; February 2015
48. International Society for the Advancement of Spinal Surgery; San Diego, CA; April 2015
49. Georgia Neurosurgical Society Annual Meeting; Sea Island, GA; May 2015
50. Becker's Spine, Orthopedic and Pain Management Conference: The Future of Spine; Chicago, IL; June 2015
51. Selby Spine Conference; Foundation for Orthopaedic Research and Education; Park City, UT; February 2016
52. Cedars Sinai Symposium on Current Concepts in Spinal Disorders; Las Vegas, NV; February 2016.
53. State of the Art Spine Surgery: A Think Tank; Los Cabos, Mexico; June 2016
54. Cedars Sinai Symposium on Current Concepts in Spinal Disorders; Las Vegas, NV; February 2017.

55. 6th International Congress on Biotechnologies for Spinal Surgery; Berlin, Germany; April 2017.
56. State of the Art Spine Surgery: A Think Tank; Los Cabos, Mexico; June 2017.
57. Annual Musculoskeletal Education and Research Center Symposium; Philadelphia, PA. August 2017.

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