

INVITED LECTURES AND SYMPOSIA

A. INVITED INTERNATIONAL FACULTY

1. The 17th Annual State of Spine Surgery Think Tank. Provide lectures and served on discussion panels. **Faculty**. San Jose del Cabo, Mexico. June 23-25, 2022
2. Global Spine Congress. Provided lectures and moderated multiple abstract sessions and symposia. **Faculty**. Las Vegas, NV. June 1-4, 2022.
3. 29th International Meeting for Advanced Spine Techniques. **Faculty**. Miami, FL. April 6-9, 2022
4. 7th Annual International Spinal Deformity Symposium. **Faculty and Co-Director**. Predominantly practicing neurological and orthopedic spine surgeons with broad worldwide representation (>20 countries). New York City, NY, December 3-4, 2021.
5. 55th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Co-Director. Multiple meeting lectures and session moderator. **Faculty**. St Louis, MO, September 22-25, 2021.
6. Stryker Meeting of the Minds: Advanced Spinal Deformity Symposium. **Faculty and Course Director**. Provided didactic/interactive lectures and case presentations, moderated session, and organized program. Held virtually due to COVID-19. April 29-May 1, 2021
7. 28th International Meeting for Advanced Spine Techniques. **Faculty**. Orthopedic and neurosurgery spine surgeons from throughout the world. Case discussion panel. Held virtually due to COVID-19.
8. 55th Annual Meeting & Course of the Scoliosis Research Society. SRS Discussion Leader for Early Career Surgeons Session. Virtual Meeting due to COVID-19. September 9-13, 2020.
9. 54th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Lecture: Reducing Blood Loss in Spinal Deformity Surgery. Half-Day Course Debate: Cervical Alignment is as Important as Thoracolumbar Alignment. Session Moderator. **Faculty**. Montreal, Canada, September 18-21, 2019.
10. 2019 World Federation of Neurosurgical Societies Special World Congress. **Faculty**. Presented lecture on ALIF vs PCO vs PS for Adult Deformity Correction. ~1,500 registrants. Beijing, China. September 9-12, 2019
11. 11th Annual Instituto de Patologia da Coluna (IPC) Spine Course. **Faculty**. Present 10 lectures on cervical and thoracolumbar deformity and participated in case discussion panels. ~120 attendees. Sao Paulo, Brazil. June 7-8, 2019.
12. 10th Annual Global Spine Congress. **Faculty**. Presenter in Cervical Spine Research Society Symposium. ~100 attendees. Toronto, Canada. May 15-18, 2019
13. 17th Annual AOSpine North America Fellows Forum. **Faculty**. Moderated resident abstract presentation session and participated in case discussions. ~100 attendees. Banff Springs, Alberta, Canada. March 28-30, 2019.
14. Medicea Artificial Intelligence and Analytics Meeting. **Faculty**. Provided lectures and interactive discussion. Lyon, France. August 30 – September 1, 2018.
15. 25th Annual Meeting of the International Meeting for Advanced Spine Techniques. **Faculty**. Provided lectures including: (1) Case Presentations Session 4A: Degenerative Conditions of the Lumbar Spine, (2) Instructional Course Lecture- Adult Spinal Deformity Expert Decision Making and Practice: How

- to Recognize Patients at Risk for PJK, Treatment Strategies, How to Address when Failure Occurs. ~650 registrants. Los Angeles, CA. July 11-14, 2018.
16. Spine Society of Australia 29th Annual Scientific Meeting. **International Faculty.** (1) Symposium: Spinal alignment and why it matters in every case from degenerative to deformity, (2) Debate: High-grade spondylolisthesis should be reduced- case against. ~250 attendees. Adelaide, Australia. April 27-29, 2018.
 17. 16th Annual AOSpine North America Fellows Forum. **Faculty.** Moderated resident abstract presentation session and participated in case discussions. ~100 attendees. Banff Springs, Alberta, Canada. March 22-24, 2018.
 18. International Meeting for Advanced Spine Techniques. **Faculty.** (1) Moderator for session 2A: Whitecloud Basic Science Nominees and Top-Scoring Abstracts Presentations, (2) Case Presentations Session 8B: Diagnosis and Treatment of Spine Trauma, (3) Instructional Course Lecture Session 10A: De Novo Scoliosis- Decompress, Decompress and Fuse or Deformity Correction, (4) Session 12- What's New in Spine trauma: What's New in Thoracolumbar Trauma. Predominantly practicing international orthopedic and neurosurgical spine surgeons. ~600 registrants. Cape Town, South Africa. July 12-15, 2017.
 19. XVII Congress of the Brazilian Academy of Neurosurgery. **International Faculty.** Goiania, Brazil. Provided multiple lectures to attendees, including topics of cervical spine trauma, when to fuse for degenerative lumbar disease, and basic biomechanics of sagittal balance for neurosurgeons. Goiania, Brazil. June 14-17, 2017.
 20. Zimmer Biomet Meet the Master Lecture Series. **International Faculty.** Visited and provided multiple lectures and case reviews at 6 sites in 4 cities: Beijing, Shanghai, Chengdu, and Chengsha. Topics included cervical deformity evaluation and management, thoracolumbar deformity evaluation and management, surgical complication occurrence and how to reduce, and case presentations and discussion. China. June 1-6, 2017.
 21. Global Spine Congress. **Faculty.** (1) Organized and moderated symposium on Cervical Deformity: Evaluation and Management. (2) Invited presenter for symposium on Postoperative Problems in Spine Surgery Patients- lecture title: Maximizing long-term outcomes of major spine surgery. What matters? Milan, Italy. ~200 session attendees. May 3-6, 2017.
 22. 15th Annual AOSpine North America Fellows Forum. **Faculty.** Moderated resident abstract presentation session and participated in case discussions. ~100 attendees. Banff Springs, Alberta, Canada. March 23-27, 2017.
 23. Annual Meeting of the Brazilian Neurosurgery Congress. **International Faculty.** Provided series of plenary and specialty session presentations: (1) Implementation of a quality registry: importance and barriers, (2) Complications of degenerative deformity surgery: results of a multicenter study, (3) Surgical principles for correction of cervical deformity, (4) Value based spine care: an overview of the concepts and its importance, (5) Evaluation of spinopelvic parameters. Brasilia, Brazil. September 6-10, 2016.
 24. 23rd International Meeting on Advanced Spine Technologies. (1) Moderator for Whitecloud clinical and basic science award nominees session, (2) Roundtable 5C: Adult degenerative scoliosis, (3) Roundtable 8B; PJK considerations, (3) Instructional course lecture 11C: Emerging technologies in spine surgery: Intra-op factors that help limit blood loss during major spinal reconstructions. **Faculty.** Washington, DC. July 13-16, 2016.
 25. Global Spine Congress. Provided lecture for the AOSpine North America Symposium- Controversies, Challenges and Opportunities in the Management of Aging Spine. Lecture title: Management of Spinal Deformity in the Aging Spine. **Faculty.** Dubai, United Arab Emirates. April 13-16, 2016

26. Chilean Orthopedic Society Annual Meeting. Provided 6 lectures for the meeting: (1) Minimally Invasive Spine Decompression in the Elderly: Benefits and Indications, (2) Decompression and Fusion with Deformity Correction (vs No Deformity Correction) in the Elderly, (3) Cervical and Global Sagittal Balance in the Cervical Deformity Patients, (4) Spine Deformity in Patients Over 75 Years: Which Patients Benefit from Surgery?, (5) Sagittal and Coronal Symptomatic Imbalance: Which Parameters to Consider and Available Surgical Options, (6) Thoracolumbar Spine Fractures in the Osteoporotic Elderly: When to Operate and What to Correct. **Special Invited International Faculty**. La Serena, Chile. November 19-21, 2015.
27. 22nd International Meeting on Advanced Spine Technologies. (1) Roundtable 5C: Adult degenerative scoliosis, (2) Roundtable 8C: Cervical degenerative disease & CSM, (3) Moderator for session 10B: Adult deformity II- surgical planning and techniques. **Faculty**. Kuala Lumpur, Malaysia. July 8-11, 2015.
28. Global Spine Congress. Predominantly international orthopedic and neurosurgical spine surgeons. Invited faculty for AO Knowledge Forum Session on Deformity (lecture title: Proximal and distal junctional problems). **Faculty**. Buenos Aires, Argentina. May 20-23, 2015.
29. 42nd Annual Meeting of the Cervical Spine Research Society. Predominantly practicing national and international orthopedic and neurosurgical spine surgeons. Invited faculty for pre-meeting course (lecture title: Classification of cervical spine complications: impact on disability, cost and patient satisfaction). Invited faculty for special symposium on cervical deformity held during general session (lecture title: Perioperative considerations and complications in cervical deformity surgery). **Faculty**. Orlando, FL. December 3-6, 2014.
30. 3rd AANS/SRS Spine Deformity Solutions: A Hands-on Course. Predominantly practicing international orthopedic and neurosurgical spine surgeons. Faculty for cadaver lab and provided lecture: Thoracolumbar posterior open and minimally invasive techniques. **Faculty**. Burr Ridge, IL. October 9-10, 2014.
31. Biomet Brazilian Neurosurgeon Spine Deformity Course. Multiple lectures and cadaver lab teaching. Lecture titles: (1) Basics of radiographic assessment of spino-pelvic alignment, (2) Realignment from SPO to VCR, (3) Iliac fixation, and (4) Revision adult deformity case review. **Faculty**. Parsippany, NJ. August 14-15, 2014.
32. 49th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Lecture: Complex scoliosis surgery: learning from the SRS M&M database. **Faculty**. Anchorage, AK, September 10-13, 2014.
33. 21st International Meeting on Advanced Spine Technologies. (1) Roundtable 8B: Thoracolumbar Trauma, (2) Instructional course lecture: Basics of radiographic assessment of spino-pelvic alignment. **Faculty**. Valencia, Spain. July 16-19, 2013.
34. Scoliosis Research Society Worldwide Conference with 2014 Spine Congress of the South African Spine Society. Predominantly practicing orthopedic and neurosurgical spine surgeons from South Africa. Provided multiple lectures: (1) Sagittal Balance- Importance and Assessment, (2) Cervical degeneration to Deformity, (3) Pediatric MRI and Intraspinial Pathology. **Faculty**. Capetown, South Africa, May 29-30, 2014.
35. 2nd AANS/SRS Spine Deformity Solutions: A Hands-on Course. Predominantly practicing international orthopedic and neurosurgical spine surgeons. Faculty for cadaver lab. **Faculty**. Houston, TX, April 24-26, 2014.

36. SRS Spine Deformity Solutions: A Hands-on Course. Predominantly practicing international orthopedic and neurosurgical spine surgeons. Faculty for cadaver lab. **Faculty**. Chicago, IL, October 4-5, 2013.
37. 48th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Lecture: Advanced DISH with Dysphagia: Treatment Options. Panelist for Roundtable Session: Complications and Congenital Scoliosis. **Faculty**. Lyon, France, September 18-21, 2013.
38. VuMedi Webinar. Topic: The International Spine Study Group (ISSG) Presents “News from the Frontlines of Adult Deformity Research and Treatment.” Lecture title: Treatment of Flatback vs Global Sagittal Deformity and Outcomes. **Faculty and Panelist**. August 5, 2013.
39. 20th International Meeting on Advanced Spine Technologies. Roundtable 3C: Cervical Trauma. **Faculty**. Vancouver, British Columbia, Canada. July 10-13, 2013.
40. 47th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Lecture: The lateral transpoas approach for adult spinal deformity correction: Hype or improved patient care? **Faculty**. Chicago, IL, September 5-8, 2012.
41. 47th Annual Meeting & Course of the Scoliosis Research Society. SRS Pre-meeting Course Roundtable and Case Discussion: Which techniques are applicable to correcting adult sagittal and coronal imbalance? **Faculty**. Chicago, IL, September 5-8, 2012.
42. 47th Annual Meeting & Course of the Scoliosis Research Society. SRS Special Half-Day Course on Sagittal Plane Deformity- Cradle to Grave. Lecture: EBM, HRQOL data, patient selection and outcome expectations. **Faculty**. Chicago, IL, September 5-8, 2012.
43. 47th Annual Meeting & Course of the Scoliosis Research Society. SRS Special Half-Day Course on Sagittal Plane Deformity- Cradle to Grave. Lecture: PJK Risk factors, HRQOL data, and techniques. **Faculty**. Chicago, IL, September 5-8, 2012.
44. 47th Annual Meeting & Course of the Scoliosis Research Society. SRS Special Half-Day Course on Sagittal Plane Deformity- Cradle to Grave. Panelist for roundtable discussion of sagittal plane deformity cases. **Faculty**. Chicago, IL, September 5-8, 2012.
45. 19th International Meeting on Advanced Spine Technologies. Instructional Course Lecture (ICL) 2B: Management of Cervical Spondylotic Myelopathy: Complications in the Treatment of CSM. **Faculty**. Istanbul, Turkey, July 18-21, 2012.
46. 19th International Meeting on Advanced Spine Technologies. Roundtable Case Discussions: Cervical Reconstruction. **Faculty**. Istanbul, Turkey, July 18-21, 2012.
47. 19th International Meeting on Advanced Spine Technologies. Instructional Course Lecture (ICL) 4A: Infection and Post-Infectious Deformity: Deep Wound Infection Following Spinal Instrumentation- Best Management. **Faculty**. Istanbul, Turkey, July 18-21, 2012.
48. 19th International Meeting on Advanced Spine Technologies. Instructional Course Lecture (ICL) 5B: The Osteoporotic Spine- Fixation Challenges and Solutions: New Technologies for Osteoporotic Fixation. **Faculty**. Istanbul, Turkey, July 18-21, 2012.
49. 46th Annual Meeting of the Scoliosis Research Society. Pre-meeting Course: Techniques for Optimizing Safety and Outcomes in Spinal Deformity Surgery (pre-meeting course): Outcomes, Expectations, and Complications. **Faculty**. Louisville, KY, September 14-17, 2011.

50. 18th International Meeting on Advanced Spine Technologies. Instructional Course Lecture (ICL) 5D: Adult/Pediatric Deformity: My Worst Complication and How I Treated It. **Faculty**. Copenhagen, Denmark, July 16, 2011.
51. 18th International Meeting on Advanced Spine Technologies. Non-member Educational Session. Morbidity and Mortality Reporting: Why It's Important. **Faculty**. Copenhagen, Denmark, July 16, 2011.
52. 45th Annual Meeting of the Scoliosis Research Society Annual Meeting. Non-member Educational Session. **Faculty**. Kyoto, Japan, September 23, 2010.
53. 17th International Meeting on Advanced Spine Technologies. Instructional Course Lecture (ICL) 2B: Lumbar Posterior Motion Sparing. Lecture title: An Evidence-Based Review of Dynamic Stabilization in the Spine. **Course Moderator and Faculty**. Toronto, CA. July 22, 2010.
54. 17th International Meeting on Advanced Spine Technologies. Non-member Educational Session. **Faculty**. Toronto, CA. July 22, 2010.
55. World Congress for Endoscopic Surgery of the Brain, Skull Base, and Spine. Complications in Minimally Invasive Spine Surgery Course. **Faculty**. Pittsburgh, PA. April 29-30, 2010.
56. North American Spine Society. Concepts in Adult Deformity (pre-meeting course). Lecture title: The Role of Decompression in Spinal Deformity: Does Realignment Solve the Problem? **Faculty**. San Francisco, CA. November 10-14, 2009.
57. 44th Annual Meeting of the Scoliosis Research Society. Concepts in Adult Deformity (pre-meeting course). Lecture title: The Role of Decompression in Spinal Deformity: Does Realignment Solve the Problem? **Faculty**. San Antonio, TX. September 23-26, 2009.
58. World Congress of Neurological Surgeons. Spinal Tumors Course. Lecture title: Management of Spinal Ependymoma. **Faculty**. Boston, MA. September 3-5, 2009.

B. INVITED NATIONAL FACULTY

1. AANS/NREF Spinal Deformity Course for Residents. Course Co-Director and Faculty. Organized and managed course with along with Dr. Dan Sciubba and the AANS staff. Provided multiple lectures. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. Phoenix, AZ. April 1-3, 2022.
2. Advanced Training in Cervical Deformity. **Faculty and Course Co-Director**. Provide multiple lectures and one-on-one teaching in the lab. ~30 registrants. Carlsbad, CA. February 25-26, 2022.
3. Spine Base to Summit Course. **Faculty and Course Co-Director**. Provided multiple didactic lectures and served as panelist for case discussions. >100 registrants for meeting, primarily practicing orthopedic surgeons and neurosurgeons from throughout North America. Vail, CO. January 14-17, 2022.
4. Congress of Neurological Surgeons. **Faculty**. Presenter and discussant for symposium: Thoracolumbar Spinal Deformity for the Non-Deformity Spine Surgeon. ~50 attendees. Austin, TX. October 16-20, 2021
5. Grand Rounds Presenter. Adult Spinal Deformity: What Do We Know? Where Are We Going? Department of Neurosurgery. University of Texas at Austin. June 29, 2021

6. Spine Base to Summit Course. **Faculty**. Provided multiple didactic lectures and served as panelist for case discussions. >100 registrants for meeting, primarily practicing orthopedic surgeons and neurosurgeons from throughout North America. Vail, CO. January 23-26, 2020.
7. 5th International Spinal Deformity Symposium. **Faculty**. Provided lectures including: Posterior-Alone Correction for Dropped Head Syndrome. New York City, NY. December 6-7, 2019.
8. 47th Annual Meeting of the Cervical Spine Research Society. ~700 registrants, primarily practicing neurosurgeons and orthopedic surgeons from around the United States and international. **Faculty and Program Co-Chair**. New York City, NY. November 21-23, 2019.
9. 9th Annual UCSF Techniques in Complex Spine Surgery. Provided course lecture: Three-column osteotomy vs interbody for major sagittal malalignment. Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Las Vegas, NV. November 8-9, 2019.
10. Congress of Neurological Surgeons. Symposium faculty: Cervical Deformity for the Non-Deformity Surgeon. Luncheon seminar faculty: Strategies to Avoid Proximal Junctional Kyphosis. Moderator for case-based discussions session: Cervical and Thoracolumbar Trauma. **Faculty**. San Francisco, CA. October 19-23, 2019.
11. 28th International Meeting for Advanced Spine Techniques. **Faculty**. Predominantly practicing international orthopedic and neurosurgical spine surgeons. ~700 registrants. Amsterdam, The Netherlands. July 17-20, 2019
12. 16th Annual State of the Spine Think Tank. **Faculty**. Presenter. Primarily practicing orthopedic surgeons and surgeons. ~100 attendees. Aruba. June 27-29, 2019.
13. ISSG NASS Course on Adult Spinal Deformity: Using Research to Transform Your Practice and Improve Outcomes. Primarily practicing orthopedic surgeons and neurosurgeons. National and international attendees. Provided multiple lectures and provided instruction in cadaver lab. Burr Ridge, IL. March 22-23, 2019
14. 35th Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves Spine Summit. Invited faculty: moderator for debate session and scientific abstract session. Primarily practicing orthopedic surgeons and neurosurgeons. Miami, FL. March 14-17, 2019.
15. AANS/NREF Spinal Deformity Course for Residents. Course Co-Director and Faculty. Organized and managed course with along with Dr. Dan Sciubba and the AANS staff. Provided lecture: Radiographic evaluation of thoracolumbar spinal deformity. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. Phoenix, AZ. February 22-24, 2019.
16. Spine Base to Summit Course. **Faculty**. Provided multiple didactic lectures and served as panelist for case discussions. >100 registrants for meeting, primarily practicing orthopedic surgeons and neurosurgeons from throughout North America. Vail, CO. January 18-21, 2019.
17. 46th Annual Meeting of the Cervical Spine Research Society. **Faculty**. Invited faculty for Pre-meeting Instructional Course and for Special Symposium. Scottsdale, AZ. December 6-8, 2018
18. 4th International Spinal Deformity Symposium. **Faculty**. Panelist for case discussions and provided lectures including: Update on Assessment of Normal Sagittal Spinal Alignment. New York City, NY. November 30-December 1, 2018.
19. 8th Annual UCSF Techniques in Complex Spine Surgery. Provided course lecture: Risk Stratification and Predictive Modeling in Adult Deformity Surgery. Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Las Vegas, NV. November 2-3, 2018.

20. Current Concepts in Adult Deformity Correction Utilizing Posterior and Lateral Techniques. Faculty. Provided multiple lectures and cadaver lab support. Primarily practicing orthopedic surgeons and neurosurgeons. Denver, CO. September 14-15, 2018.
21. 3rd Annual Spinal Deformity Symposium at the Seattle Science Foundation (Swedish Neuroscience Institute). **Faculty**. Provided multiple lectures and support for hands-on workshop. Primarily practicing orthopedic surgeons and neurosurgeons. Seattle, WA. August 4, 2018
22. 34th Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves Spine Summit. Invited faculty for premeeting course: Essentials of Spinal Deformity Required for all Spinal Surgeons. ~600 registrants for meeting. Primarily practicing orthopedic surgeons and neurosurgeons. Orlando, FL. March 14-17, 2018
23. Spine Base to Summit Course. **Faculty**. Provided multiple didactic lectures and served as panelist for case discussions. ~90 registrants for meeting, primarily practicing orthopedic surgeons and neurosurgeons from throughout North America. Beaver Creek, CO. January 18-21, 2018.
24. 3rd International Spinal Deformity Symposium. **Faculty**. Panelist for case discussions and provided lectures including: Update on Assessment of Normal Sagittal Spinal Alignment. Chicago, IL. November 2-3, 2017.
25. Visiting Professor, University of Alabama Department of Neurosurgery. Provided lectures and discussions with the residents and faculty: (1) Adult Deformity Surgery. What Do We Know and Where Are We Going? (2) Cervical and Thoracolumbar Deformity Case Review. Birmingham, AL. October 12-14, 2017.
26. Congress of Neurological Surgeons Annual Meeting. Faculty. Provided lecture for premeeting course: Spinal Deformity Thoracolumbar and Cervical Case-Based Presentations. Boston, MA. October 7-11, 2017.
27. ISSG-AO Spine Course on Adult Spinal Deformity Critical Knowledge Course for Practicing Surgeons). **Faculty**. (1) Cervical alignment, malalignment, correction and outcomes. (2) Faculty for cadaver lab. Las Vegas, NV. May 11-12, 2017.
28. American Association of Neurological Surgeons Annual Meeting. Pre-Meeting Course: Spinal Alignment: What Every Surgeon Needs to Know. **Faculty**. Provided lecture: Regional and Segmental Lumbar Lordosis: Why It's Important and How to Optimize. Also provided case presentation and participated in panel discussion of cases. Los Angeles, CA. April 22-26, 2017.
29. 33rd Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves Spine Summit. **Faculty**. Scientific session and special course moderator and provided didactic lectures as part of a special course and an industry-sponsored lunchtime symposium: (1) Leveraging research to improve the surgical treatment of adult spinal deformity. (2) TLIF for restoration of lordosis. Las Vegas, NV. March 8-11, 2017.
30. One AO 2017 Leadership Meeting. **Faculty**. Provided didactic lecture: Adult Spine Deformity: Where are we now and where are we going? Palm Springs, CA. February 9-11, 2017.
31. Spine Base to Summit Course. **Faculty**. Provided multiple didactic lectures and served as panelist for case discussions. 92 registrants for meeting, primarily practicing orthopedic surgeons and neurosurgeons from throughout North America. Beaver Creek, CO. January 26-29, 2017.
32. 2nd International Spinal Deformity Symposium. **Faculty**. Panelist for case discussions and provided multiple lectures including: (1) Adult Degenerative Scoliosis: Analysis and Decision Making Based on Clinical and Radiographic Presentation, (2) Step-by-Step for Posterior Spinal Fusion with Posterior

- Column Osteotomies for a Cervico-Thoracic Fixed Deformity, (3) Complication Avoidance and Treatment: Pseudarthrosis. Chicago, IL. November 11-12, 2016.
33. American Association of Neurological Surgeons Annual Meeting. Pre-Meeting Course: Thoraco-Lumbo-Sacral Alignment: Indications, Techniques, and Case Discussions. **Faculty**. Provided lecture: Radiographic evaluation of adult spinal deformity. Also provided case presentation and participated in panel discussion of cases: 75-year-old with flatback in need of a pedicle subtraction osteotomy: is surgery worthwhile? Chicago, IL. April 30 - May 4, 2016
 34. AANS/NREF Spinal Deformity Course for Residents. Course Co-Director and Faculty. Organized and managed course with along with Dr. Robert Heary and the AANS staff. Provided lecture: Radiographic evaluation of thoracolumbar spinal deformity. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. Baltimore, MD. April 1-3, 2016.
 35. 32nd Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves Spine Summit 2016. **Faculty**. Provided didactic lectures as part of pre-meeting course and lunchtime symposium: (1) Why do patients improve following adult spinal deformity surgery and what patients are at risk for not improving?, (2) Assessment of osteoporosis, (3) Teriparatide: Is this an answer in geriatric patients? Orlando, FL. March 16-19, 2016.
 36. 67th Southern Neurosurgical Society Annual Meeting. **Faculty**. Provided didactic lecture: Why and how to utilize alignment parameters in adult deformity surgery. San Antonio, TX. March 2-5, 2016
 37. 1st International Spinal Deformity Symposium. **Faculty**. Panelist for case discussions and provided multiple lectures including: (1) Adult Degenerative Scoliosis: What do we know? Review of current research, (2) High-grade spondylolisthesis in adults: Introduction to the problem with case examples, (3) Practical Deformity Surgery Tips: When not to do a PSO! Chicago, IL. December 4-5, 2015.
 38. 20th Instructional Course of the Cervical Spine Research Society. Provided course lecture: Complication prevention: rod fractures, DJK, neurological deficits after cervical deformity surgery. **Faculty**. San Diego, CA. December 2, 2015.
 39. Congress of Neurological Surgeons Pre-meeting Course- Spinal Deformities: Short, Long, Medical-What is the Best Option? With Cased-based Discussions. **Faculty**. Presented deformity cases and participated in panel discussion of cases. New Orleans, LA. September 26-30, 2015.
 40. Innovative and Advanced Surgery of the Degenerative and Deformed Lumbar Spine. Hands-On Cadaver Course. **Faculty**. Provided multiple lectures including: (1) Decision Making in Management of Adult Lumbar Scoliosis and Kyphosis, (2) Debate: Posterior approach for adult deformity correction. Also provided one-on-one surgical technique instruction in cadaver lab session. St Louis, MO. August 20-22, 2015.
 41. Degenerative to Complex Spine: How to Make the Leap. Didactic and cadaver lab course sponsored by K2M. **Faculty**. Provided lecture: Nonunion after Three-Column Osteotomies and How to Avoid Them. Also provided one-on-one surgical technique instruction in cadaver lab session. Leesburg, Virginia. May 30, 2015.
 42. American Association of Neurological Surgeons Pre-meeting Course: Techniques for Adult Spinal Deformity Surgery: A Hands-on Course for Neurosurgeons. **Faculty**. Provided lecture: Avoidance and Management of Proximal Junctional Kyphosis. Also provided one-on-one surgical technique instruction in cadaver lab session. American Association of Neurological Surgeons Annual Meeting. Washington, D.C. May 2-6, 2015.
 43. 4th Annual Spine Deformity Solutions: A Hands-On Course. **Faculty**. Provided lecture: Video Demonstration and Discussion of Posterior Occipito-Cervical Techniques. Also provided one-on-one surgical technique instruction in cadaver lab session. Houston, TX. April 9-11, 2015.

44. AANS/NREF Spinal Deformity Course for Residents. Course Co-Director and Faculty. Organized and managed course with along with Dr. Robert Heary and the AANS staff. Provided lectures: (1) Radiographic Evaluation of Thoracolumbar Spinal Deformity and (2) Anterior Cervical Surgery for Deformity Correction. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. Baltimore, MD. March 27-29, 2015.
45. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. **Faculty**. Provided lecture: Choosing the Most Appropriate Upper and Lower Instrumented Vertebra and the Consequences of Wrong Decisions. Participated as debater: Laminectomy and fusion for scoliosis with foraminal stenosis (vs indirect decompression). Phoenix, AZ. March 4-7, 2015.
46. Innovasis Spine Surgery Symposium: Improving the Value of Spine Surgery. Provided lectures: (1) Outcomes of operative vs nonoperative treatment, (2) Importance of cervical alignment in overall sagittal balance. Deer Valley, UT. February 27-28, 2015.
47. Spine Base to Summit Course. Panelist for case discussions and moderator for participant case presentation sessions. **Faculty**. Beaver Creek, CO. January 16-19, 2015.
48. Disruptive Thoughts in Global Alignment (Nuvasive). Provided course lecture: Posterior Approach to Anterior Column Reconstruction. Led hands-on case discussion and lab sessions: (1) Mild to Moderate Deformity, (2) Moderate to Complex Deformity. **Faculty**. Chicago, IL. December 12-13, 2014.
49. 4th Annual UCSF Techniques in Complex Spine Surgery. Provided course lecture: The Importance of Sagittal Spinopelvic Alignment. Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Las Vegas, NV. November 7-8, 2014.
50. AANS/NREF Spinal Deformity Course for Residents. Course Co-Director and Faculty. Organized and managed course with along with Dr. Robert Heary and the AANS staff. Provided lectures: (1) Sacro-Pelvic Parameters/Principles and (2) Sacropelvic Workshop. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. Baltimore, MD. May 16-18, 2014.
51. American Association of Neurological Surgeons Special Course- 001: Techniques for Adult Spinal Deformity Surgery: A Hands-On Course for Neurosurgeons. Invited Faculty. Provided key lecture: Avoidance and Management of Proximal Junctional Kyphosis. Also provided one-on-one surgical technique instruction in cadaver lab session. **Faculty**. San Francisco, CA. April 5-9, 2014.
52. DePuy Synthes Spine Deformity Summit. DePuy sponsored course. Provided course lectures: (1) PJK in Adults: Cause, Prevention, and Treatment. And (2) Adult Spodylolisthesis. **Faculty**. Boston, MA. March 27-29, 2014
53. Current Techniques in Spinal Deformity Surgery. Biomet sponsored course. Provided course lectures: (1) Spinal Pelvic Parameters and Their Impact on Correction and Outcomes. (2) Adult deformity case presentation. Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Las Vegas, NV. March 22-23, 2014
54. American Academy of Orthopedic Surgeons, Invited faculty for Annual Meeting for 2 Instructional Course Lectures (ICL). (1) Adult Spinal Deformity: Surgical Planning and Complications, and (2) Realignment and Planning in Adult Spinal Deformity: The Newest Tools, Formulas and Techniques to Get it Right. **Faculty**. New Orleans, LA. March 11-15, 2014.
55. Complications in Complex Spine Surgery. Globus sponsored course. Provided course lectures: (1) Complications and Treatments with Low Profile Anterior Cervical Implants; (2) Anterior Cervical Complication Case Presentation and Discussion; (3) Debate: Perfect versus Patient-Specific

- Restoration of Sagittal Spino-pelvic Alignment in Adult Deformity Surgery. **Faculty**. San Diego, CA. February 21-22, 2014.
56. Principles and Treatment of Spinal Disorders for Residents. Invited faculty. AOSpine sponsored course. Provided course lectures/small group discussions: (1) Deformity Principles and (2) Degenerative and Isthmic Spondylolisthesis. **Faculty**. Las Vegas, NV. January 24-25, 2014.
 57. 18th Instructional Course of the Cervical Spine Research Society. Provided course lecture: Clinical Assessment and Surgical Decision Making in Cervical Deformity. **Faculty**. Los Angeles, CA. December 4, 2013.
 58. 3rd Annual UCSF Techniques in Complex Spine Surgery. Provided course lecture: The Importance of Sagittal Spinopelvic Alignment. Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Las Vegas, NV. November 8-9, 2013.
 59. Advanced Concepts in Adult Deformity. Invited lecturer. Globus sponsored course. Lecture titles: (1) Is Adult Deformity Surgery Worth It? and (2) Debate: Minimally Invasive Spine Surgery for Adult Spinal Deformity: Improved Patient Care Or Hype? Also panelist for multiple case presentation workshops. Chicago, IL. August 16, 2013
 60. American Association of Neurological Surgeons Special Course- 027: Techniques for Adult Spinal Deformity Surgery: A Hands-On Course for Neurosurgeons. Invited Faculty. Provided key lecture: The Importance of Global Spinal Balance and Pelvic Parameters in Surgical Planning. Also provided one-on-one surgical technique instruction in cadaver lab session. New Orleans, LA. April 28, 2013
 61. American Association of Neurological Surgeons Special Dinner Symposium: SE130: Biologics and Spine Fusion. Invited Faculty. Provided lecture: What are your patients learning about BMP on the internet? New Orleans, LA. April 30, 2013
 62. American Association of Neurological Surgeons Spinal Deformity Course for Residents. Invited Faculty. American Association of Neurological Surgeons Spinal Deformity Course for Residents. Provided multiple lectures: (1) Sacropelvic Parameters and Principles; (2) Spinopelvic Parameters Workshop; (3) Adult Deformity Surgery. Also provided one-on-one surgical technique instruction in multiple cadaver lab session. Baltimore, MD. March 22-24, 2013
 63. American Academy of Orthopedic Surgeons. Invited for Scientific Exhibit. Title: Scoliosis Research Society: Rates and Causes of Mortality Associated with Spine Surgery Based on 108,419 Procedures. Chicago, IL. March 19-23, 2013
 64. American Academy of Orthopedic Surgeons. Invited lecturer. Instructional Course: Realignment Planning in Adult Deformity: The Newest Tools, Formulas and Techniques to Get it Right. Lecture title: Surgical Technique Options for Realignment from SPO to VCR. Chicago, IL. March 19-23, 2013
 65. Lumbar Degenerative and Deformity: MIS vs Open. Invited lecturer. Globus sponsored course. Lecture titles: (1) Sagittal Alignment Principles: Spino-Pelvic Parameters and (2) How to Choose Osteotomies and Basic Techniques. Also guided multiple hands-on technique workshops. Savannah, GA. March 15-16, 2013
 66. 29th Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. Invited lecturer. Special AO Spine North America co-branded course: Adjacent Segment Disease. Lecture title: Indications for Treatment of Adjacent Segment Disease. Phoenix, AZ. March 6-9, 2013
 67. 40th Annual Cervical Spine Research Society Meeting. Provided lecture: Standard Transoral Approaches and Basilar Invagination. Chicago, IL. December 6-8, 2012.

68. AOSpine Advanced Techniques in Cervical Spine Surgery: A Hands-on Human Anatomic Specimen Course. Course Director and provided course lectures: (1) Arthroplasty: Instrumentation Techniques (Artificial Disc Replacement), (2) Vertebral Artery Injury, (3) Case presentation and discussion over lunch. Provided one-on-one training in the hands-on cadaveric lab. **Course Director and Faculty.** Phoenix, AZ. November 16-17, 2012.
69. 2nd Annual UCSF Techniques in Complex Spine Surgery. Provided course lecture: Complex Adult Deformity Spinal Pelvic Alignment. Provided one-on-one training in the hands-on cadaveric lab. **Faculty.** Las Vegas, NV. November 8-10, 2012.
70. Congress of Neurological Surgeons. Pre-Meeting Course PCO2- Minimally Invasive Spinal Surgery. Lecture title: Spino-Pelvic Parameters: How to Measure and Clinical Importance. **Faculty.** Chicago, IL. October 6-10, 2012.
71. Congress of Neurological Surgeons. Lunch Seminar W42- Sagittal Balance in Spine Surgery. Provided one-on-one training in the hands-on cadaveric lab. **Faculty.** Chicago, IL. October 6-10, 2012.
72. Second Annual Johns Hopkins Spine Workshop. Provided course lecture: Spinal Biomechanics and Global Spinal Alignment. Provided one-on-one training in the hands-on cadaveric lab. **Faculty.** Baltimore, MD. September 14-15, 2012.
73. American Association of Neurological Surgeons. Special Course: Current Surgical Techniques and Approaches to Minimally Invasive Spine Surgery. (pre-meeting course). Provided one-on-one training in the hands-on cadaveric lab. **Faculty.** Miami, FL. April 15, 2012.
74. American Association of Neurological Surgeons Spinal Deformity Course for Residents. Baltimore, MD. Didactic sessions and teaching in cadaver lab. Lecture titles: (1) Basics of Spinal Deformity: Global Sagittal Alignment and (2) Scheuermann's Kyphosis. **Faculty.** March 31-April 1, 2012
75. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Session: Complication Avoidance and Management. Lecture title: Junctional Kyphosis. **Faculty.** Orlando, FL. March 7-10, 2012.
76. American Academy of Orthopedic Surgeons Annual Meeting, Specialty Day. Scoliosis Research Society Section of the Federation of Orthopedic Societies of America (FOSA): Comparative Effectiveness. San Francisco, CA. Lecture title: Treatment of spinal stenosis associated with lumbar degenerative scoliosis. **Faculty.** February 7-11, 2012.
77. Spinal Deformity: A Neurosurgical Perspective. San Diego, CA. Lecture titles: (1) Open deformity correction version minimally invasive, (2) Coronal correction techniques for spinal deformity surgery. **Faculty.** January 27-28, 2012.
78. 21st Annual Dr. Tom Lowe Spine Symposium: The Surgical Management of Spinal Disorders. Beaver Creek, CO. Lecture title: Spondylolisthesis: With MIS Technique, Why Would Anyone Do Open Surgery? **Faculty.** January 13-16, 2011.
79. Goodman Oral Board Review Preparation: Neurosurgery Review by Case Management Course. Breakout session faculty. Presented cases one-on-one. **Faculty.** Houston, TX. November 6-8, 2011.
80. Congress of Neurological Surgeons Special Course PC08: Inpatient and Outpatient Management Dilemmas for Allied Health Care Professionals (pre-meeting course). Lecture title: Operative versus Nonoperative Treatment of Cervical Spine Trauma. **Faculty.** Washington, DC. October 1-6, 2011.

81. Congress of Neurological Surgeons Special Course PC09: Minimally Invasive Spinal Surgery. (pre-meeting course). Provided one-on-one training in the hands-on cadaveric lab. **Faculty**. Washington, DC. October 1-6, 2011.
82. Adult Deformity: A Case Based Educational Program. Lecture title: Complications and Outcomes in Adult Deformity Surgery. **Faculty**. Chicago, IL. August 26-27, 2011.
83. Third Annual Current Techniques in Spinal Deformity Surgery (Sponsored by Biomet Spine). Lecture titles: (1) Use of Osteotomy and Vertebral Column Resection Techniques for Deformity Correction and (2) Minimally Invasive Surgery vs Open Surgery for Spinal Deformity Correction: Benefits and Pitfalls. **Faculty for cadaver lab and for didactic sessions**. Orlando, FL. March 26-27, 2011.
84. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course III: Spinal Deformity. Lecture title: Complications in Spinal Deformity. **Faculty**. Phoenix, AZ. March 9-12, 2011.
85. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course IV: Advanced Minimally Invasive Spine Techniques. Lecture title: Minimally Invasive Spinal Deformity Surgery. **Faculty**. Phoenix, AZ. March 9-12, 2011.
86. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course IX: Evaluation and Management of the Spine Trauma Patient. Lecture title: Subaxial Radiographs, Classification, Nonoperative vs Operative. **Faculty**. Phoenix, AZ. March 9-12, 2011.
87. Congress of Neurological Surgeons. Practical Course: Inpatient and Outpatient Management Dilemmas for Allied Health Care Professionals. Lecture title: Treatment of Cervical Spine Trauma: Operative and Nonoperative. **Faculty**. San Francisco, CA. October 17, 2010.
88. American Association of Neurological Surgeons. Current Techniques and Approaches to MIS Spine Surgery. Lecture title: Cervical MED/Foraminotomy/Decompression of Stenosis. **Faculty for cadaver lab and for didactic sessions**. Philadelphia, PA. May 1-5, 2010.
89. 2010 DePuy Spine Neurosurgery Residents Spine Education Summit. Lecture title: Multi-level anterior cervical disc fusion and cervical corpectomy. **Faculty for cadaver lab and for didactic sessions**. Raynham, MA. March 4-6, 2010.
90. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course on Spinal Deformity. Lecture title: The Role of Decompression in Spinal Deformity: Does Realignment Solve the Problem? **Faculty**. Orlando, FL. February 17-20, 2010.
91. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course on Advanced Minimally Invasive Spine Surgery Techniques and Managing Complications. Lecture title: Minimally Invasive Scoliosis Surgery. **Faculty**. Orlando, FL. February 17-20, 2010.
92. Congress of Neurological Surgeons / American Association of Neurological Surgeons Spine Joint Section Meeting. Special Course on Evaluation and Management of the Spine Trauma Patient. Lecture title: Subaxial radiographs, Classification, Non-operative vs. Operative. **Faculty**. Orlando, FL. February 17-20, 2010.
93. Congress of Neurological Surgeons. Concepts in Adult Deformity (pre-meeting course). Lecture title: The Role of Decompression in Spinal Deformity: Does Realignment Solve the Problem? **Faculty**. New Orleans, LA. October 24-29, 2009.

94. Congress of Neurological Surgeons. Spine Masters Symposium: Pedicle Subtraction Osteotomy Surgical Technique (CI Shaffrey, JS Smith, DK Hamilton). **Faculty**. New Orleans, LA. October 24-29, 2009.

C. INVITED REGIONAL FACULTY

1. Concepts and Controversies in Spinal Disorders. Lecture title: Spondylolisthesis. **Faculty**. Concepts and Controversies in Spinal Disorders. Didactic Course. Charlottesville, VA. September 11-12, 2015
2. Neurosurgical Society of the Virginias Annual Meeting. Education Program Speaker. Lecture title: Odontoid Fractures in the Elderly. **Faculty**. Greenbrier, WV. January 20-22, 2011
3. Neurosurgical Society of the Virginias Annual Meeting. Education Program Speaker. Lecture title: Adult Scoliosis: Is Surgical Treatment Worthwhile? **Faculty**. Greenbrier, WV. January 20-22, 2011
4. Albermale County Medical Society. Keynote Speaker for Educational Session. Lecture title: Minimally Invasive Spine Surgery: Where Have We Been and Where Are We Going? Charlottesville, VA. March 5, 2009.
5. UVA 37th Annual Art and Science of Sports Medicine. Keynote Speaker. Lecture title: Medical Management of the Cervical Spine Injured Athlete. Charlottesville, VA. June 6, 2009.