

Date: July 2011

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE
FACULTY CURRICULUM VITAE

I. PERSONAL DATA

Name: Milton Harold Landers
Current Academic Rank: Associate Clinical Professor
Department: Anesthesiology

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PROFESSIONAL DEVELOPMENT

Undergraduate and Graduate Education

<u>Years (Inclusive)</u>	<u>Degree</u>	<u>Institution</u>
1968-1971	BS Philosophy	University of Oregon
1971-1972	BS Biology	University of Oregon
1973-1974	MS Biology	University of Oregon
1974-1978	Work towards PhD	Colorado State University
1978-1980	PhD Zoology	University of Vermont
1980-1984	DO	University of Health Sciences

Postgraduate Education:

<u>Years (Inclusive)</u>	<u>Area of Study</u>	<u>Institution</u>
1984-1985	Rotating Internship	Oklahoma Osteopathic Hospital
1985-1987	Anesthesiology	Doctors Hospital

Academic and Professional Appointments and Activities. (List in chronological order. Please explain any discontinuity in professional experience)

<u>Month and Year</u>	<u>Position</u>	<u>Institution</u>
2005 to present	Interventional Pain	Private Practice
2009 to present	Clinical Associate Professor	KU, School of Medicine
2005 to 2009	Clinical Assistant Professor	KU, School of Medicine
2002-2005	Director - Interventional Pain Headache and Pain Center	
2000-2002	Interventional Pain	Private Practice
1997-2000	Interventional Pain	Private Practice
1997-1999	Clinical Assistant Professor	Southern Illinois University

1994-1997	Director - Interventional Pain & Staff Anesthesiologist	Private Practice
1990-1992	Anesthesiologist	Private Practice
1991-1992	Adjunct Assistant Professor	University of Kansas
1987-1990	Director Pain clinic & Elmendorf	USAF Regional Hospital
Anesthesiologist		
1986	Lecturer	Columbus Technical Institute
1978-1980	Graduate Teaching Fellow	University of Vermont
1976-1978	Graduate Teaching Fellow	Colorado State University
1976	Instructor, Zoology Department	Colorado State University
1974-1975	Graduate Research Fellow	Colorado State University
1973-1974	Graduate Research Fellow	University of Oregon

Professional Registration/Licensure:

<u>Year</u>	<u>Number</u>	<u>State</u>
2000	28579	Kansas
1985	RIF 69	Missouri
1989	II 2429	Alaska

Professional Certification(s):

<u>Date</u>	<u>Board</u>
1991	American Osteopathic Board of Anesthesia (AOBA)
1996	AOBA - Added Qualification in Pain Medicine

Professional Societies and Affiliations:

<u>Year</u>	<u>Organization</u> (including offices held)
2010- present	ISIS (International Spine Intervention Society); Standards Committee
2009- present	ISIS; Board of Directors, ad hoc position
2009- present	German Interventional Pain Society, Honorary member
2008-2009	ISIS; Board of Directors, Immediate Past President
2006-2008	ISIS; President, Chairman Board of Directors
2004-2006	ISIS; Secretary, Board of Directors
2005-2007	North American Spine Society
2005-present	Kansas State Medical Society
2005-present	Sedgwick County Medical Society
2005-present	Sedgwick County Osteopathic Society
2003-2010	ISIS; Education Committee
2002-2003	ISIS; Standards Committee
1994-present	ISIS active member
1995	American Osteopathic Board of Anesthesia- In training examination committee
1988-1989	Alaska Osteopathic Medical Association- Board of trustees & Founding member
1982-present	American Osteopathic Association

TEACHING ACTIVITIES :

My teaching interest is in the area of instruction in the specialty of Interventional Pain- non-surgical spine (CMS 09); the diagnosis and treatment of pain of spinal origin. The majority of this work involves diagnostic and therapeutic spinal injections, and non-surgical spine interventions, utilizing fluoroscopy. The above involves precise needle placement in and around the spine, and interpretation of imaging studies, i.e. MRI, CT, and fluoroscopic, including evaluation of contrast patterns in regards to the pertinent anatomy and pathology.

My major educational focus involves the training of practicing, board certified physicians in the U.S., Europe and Asia.

I presently instruct the senior anesthesia residents at University of Kansas-Wichita on the subject of Interventional Pain. Prior to my volunteering to work with the residents, they had no experience in state of the art interventional pain/non-surgical spine. Their one to four month rotation is a combination of observation, daily thought provoking discussions, didactic presentations, guided reading and interactive computer programs designed to provide an introduction to this medical specialty. My practice is the only location within Kansas where instruction in high level interventional pain is obtainable, and has brought a new facet to an already excellent anesthesia program.

In the past I have performed the same function, as above, for Fellows, residents and medical students at Southern Illinois University.

Adjunct Assistant Professor for University of Kansas, School of Nurse Anesthesia. Clinical training of student nurse anesthetists.

Instruction: Didactic (e.g.: lectures and formal presentations)

15 April 2011. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar Spinal Injections: Indications and Techniques"; "Lumbar Spinal Injections: Risks, Drugs, Complications". New Orleans, LA. 4 hr. 48 board certified physicians.

7 January 2011. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar Spinal Injections: Indications and Techniques". Las Vegas, Nevada. 2 hr. 48 board certified physicians.

20 August 2010. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar Spinal Injections: Indications and Techniques". Memphis, TN, 2 hr. 48 board certified physicians.

14 July 2010. International Spine Intervention Society (ISIS) Annual Scientific Meeting. Moderator: "The herniated disc". Maui, Hawaii, ~400 physicians.

19 March 2010. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. "Cervical Spinal Injections: Indications and Techniques". Las Vegas, Nevada. 2 hr. 48 board certified physicians.

29 January 2010. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar

Spinal Injections: Indications and Techniques”, and “Lumbar Spinal Injections: Drugs, Risks and Complications. Phoenix, Arizona. 3 hr. 48 board certified physicians.

25 October 2009, International Spine Intervention Society-Europe (ISIS-Europe), Cervical Spine Workshop. “Cervical Spinal Injections: Risks and Complications”, Westfalische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 2 hrs, 28 board-certified physicians.

11 September 2009. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Cervical Spinal Injections: Indications and Techniques”, and “Cervical Spinal Injections: Drugs, Risks and Complications”. Memphis, TN. 3 hr. 48 board certified physicians.

21 August 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Spinal Injections: Indications and Techniques”, and “Lumbar Spinal Injections: Drugs, Risks and Complications. Burr Ridge, Illinois. 3 hr. 48 board certified physicians.

25 July 2009. International Spine Intervention Society (ISIS) Annual Scientific Meeting. Moderator: “Epidural Corticosteroid Injections: What is the Evidence”. Montreal, Canada, ~400 physicians.

3 April 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Spinal Injections: Indications and Techniques”, and “Lumbar Spinal Injections: Drugs, Risks and Complications”. Plano, Texas. 1 hr. 48 board certified physicians.

20 February 2009. International Spine Intervention Society (ISIS), Discography Workshop. “Discography: Indications and Techniques”, Spartanburg, S.C. 1 hr. 48 board certified physicians.

5 February 2009. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Cervical Spinal Injections: Indications and Techniques”, and “Cervical Spinal Injections: Drugs, Risks and Complications”. Phoenix, Arizona. 1 hr. 48 board certified physicians.

9 January 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Spinal Injections: Indications and Techniques”, and “Lumbar Spinal Injections: Drugs, Risks and Complications”. San Francisco, California. 1 hr. 48 board certified physicians.

1 November 2008, International Spine Intervention Society, Radiofrequency Procedures of the Spine Workshop, “Radiofrequency Neurotomy: Indications and Techniques”, Phoenix, Arizona. 2 hrs, 48 board-certified physicians.

25 October 2008, International Spine Intervention Society-Europe (ISIS-Europe), Discography Workshop. “Discography: Indications and Techniques”, Westfalische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 2 hrs, 28 board-certified physicians.

5 October 2008. International Spine Intervention Society (ISIS), Discography Workshop. “Discography: Risks and Complications”, Medical Education and Research Institute of Nevada, in Las Vegas, Nevada, 1 hrs, 48 board-certified physicians.

4 October 2008. International Spine Intervention Society (ISIS), Discography Workshop. “Discography: Indications and Techniques” and “Discography: Risks and Complications”, Medical Education and Research Institute of Nevada, in Las Vegas, Nevada, 1 hrs, 48 board-certified physicians.

5 September 2008. . International Spine Intervention Society (ISIS), Lumbar Spinal Injections Workshop. “Lumbar Spinal Injections: Indications and Techniques” and “Lumbar Spinal Injections: Risks and Complications”, Medical Education Research Institute, Memphis, Tennessee. 2 hrs, 48 board-certified physicians.

10 August 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. “Radiofrequency Neurotomy: Risks and Complications”. Spine Masters Education Center, Burr Ridge, Illinois, 1 hr, 48 board certified physicians.

9 August 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. “Radiofrequency Neurotomy: Indications and Techniques”. Spine Masters Education Center, Burr Ridge, Illinois, 1 hr, 48 board certified physicians.

25 June 2008. International Spine Intervention Society 16th Annual Scientific Meeting. Presidential Address. “Interventional Pain: ‘Raising the Bar’”. Las, Vegas, Nevada, 1 hr., >600 attendees.

24 June 2008. International Spine Intervention Society 16th Annual Scientific Meeting. “Whiplash and Cervicogenic Headaches: Case presentation and The Opposition”; “Discography: What to do?”; “Discography: The Opposition”. Las, Vegas, Nevada, 1 hr., >600 attendees.

21 June 2008. International Spine Intervention Society-European Chapter, Cervical Spine Injection Workshop, “Cervical Spinal Injections Techniques and Indications”. University of Bristol, Bristol, UK 1.5 hrs. ~36 Board Certified Physicians.

7 June 2008. International Spine Intervention Society (ISIS), Cervical Spinal Injection Workshop. “Cervical spinal Injections: Anatomy and Imaging”. Memphis, Tennessee. 3 hrs, 48 board certified physicians.

6 June 2008. International Spine Intervention Society (ISIS), Cervical Spinal Injection Workshop. “Cervical Spinal Injections: Indications and Techniques”; “Cervical Spinal Injections: Drugs, Risks, Complications”. Memphis, Tennessee. 2.5 hrs, 48 board certified physicians.

31 May 2008. Korean Spine Intervention Society. “Interventional Pain: History and Future”, “Lumbar Transforaminal Injections: Indications and Techniques”; “Lumbar Spinal Injections: Drugs, Risks, and Complications”; “Lumbar Radiofrequency Neurotomy: Theory and Technique”. Asan Medical Center, Seoul, Korea. 2 hrs., ~50 Neuro-Spine Surgeons and Physiatrists.

6 April 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. “Radiofrequency Neurotomy: Risks and Complications”. Plano, Texas. 1 hr. 48 board certified physicians.

5 April 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. “Lumbar Radiofrequency Neurotomy”. Plano, Texas. 30min. 48 board certified physicians.

28 March 2008. Portuguese Spine Society, Portuguese Pain Society, Portuguese Anesthesia Society Joint

Congress. DorVertebraldo Diagnostico a Therapeutica; “Cervical Radiculopathy: Diagnosis and Treatment”; “Cervical and Thoracic Discography: The Evidence”. Lisbon, Portugal. 2 hrs. ~ 100 Spine Surgeons, Radiologists, Anesthesiologists, and Physiatrists.

27 March 2008. Portuguese Spine Society, Portuguese Pain Society, Portuguese Anesthesia Society Joint Congress. DorVertebraldo Diagnostico a Therapeutica; “Interventional Pain: History and Future”, “Cervicogenic Headaches: Diagnosis and Treatment”; “Low Back Pain: Diagnosis and Treatment”. Lisbon, Portugal. 2.5 hrs. ~ 100 Spine Surgeons, Radiologists, Anesthesiologists, and Physiatrists.

9 March 2008. International Spine Intervention Society (ISIS), Discography Workshop. “Discography: Risks and Complications”. Orlando, Florida. 1 hr. 48 board certified physicians.

8 March 2008. International Spine Intervention Society (ISIS), Discography Workshop. “Discography Techniques: Cervical, Thoracic, Lumbar”. Orlando, Florida. 1 hr. 48 board certified physicians.

9-10 February 2008. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Cervical Spinal Injections: Drugs, Risks and Complications”. Phoenix, Arizona. 1 hr. 48 board certified physicians.

19-20 January 2008. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Spinal Injections: Drugs, Risks and Complications”. San Francisco, California. 1 hr. 48 board certified physicians.

2 November 2007. Kansas Association of Osteopathic Medicine. Annual Mid-year Conference. “Cervicogenic Headaches: Diagnosis and Treatment”. Wichita, Kansas.

27 October 2007. International Spine Intervention Society- Europe. Radiofrequency Workshop. “Radiofrequency Neurotomy: Theory”. Westfalische Whilhelms University, Muenster Institut Anatomie, Muenster, Germany.

28 October 2007. International Spine Intervention Society-Europe. Radiofrequency Workshop. “Radiofrequency Neurotomy: Risks and Complications”. Westfalische Whilhelms University, Muenster Institut Anatomie, Muenster, Germany.

13 October 2007. International Spine Intervention Society. Radiofrequency Workshop. “Radiofrequency neurotomy: Theory”. Phoenix, Arizona

14 October 2007. International Spine Intervention Society. Radiofrequency Workshop. “Radiofrequency neurotomy: Risks and Complications”. Phoenix, Arizona.

9 September 2007. International Spine Intervention Society, Lumbar Spine Injection Workshop, “Lumbar Spinal Injections; Risks, Complications and Drugs”, Memphis, TN.

4-5 August 2007. International Spine Intervention Society, Cervical Spine Injection Workshop, “Cervical Spinal Injections; Risks, Complications and Drugs”, Charlotte, North Carolina. 1 hr. ~48 Board Certified Physicians.

16-17 June 2007. International Spine Intervention Society-European Chapter, Advanced Lumbar Spine

Injection Workshop, “International Spine Intervention Society; The Past, Present and Future off Interventional Pain” and “Advanced Lumbar Spinal Injection Techniques and Indications”. University of Bristol, Bristol, UK 1.5 hrs. ~48 Board Certified Physicians.

5-6 May 2007. International Spine Intervention Society (ISIS), Advanced Lumbar Spine Injection Workshop, “Advanced Lumbar Spinal Injections: Techniques, Drugs, Risks, and Complications”, Minneapolis, MN. 1 hr. 48 board certified physicians.

27-28 April 2007. International Spine Intervention Society - Europe, Semi-Annual Scientific Meeting, “Lumbar Radiofrequency Neurotomy”, and “Cervicogenic Headaches: Diagnosis and Treatment”, Antwerp, Belgium. ~150 spine physician.s

10-11 March 2007, International Spine Intervention Society, Discography Workshop, “Discography; Risks and Complications”, Orlando, FL. 1 hr. 48 board certified physicians.

3-4 February 2007, International Spine Intervention Society, Cervical Spine Injection Workshop, “Cervical Injections: Risks and Complications”, Phoenix, AZ. 8 hrs, 48 board certified physicians.

4-5 November 2006. International Spine Intervention Society (ISIS), Advanced Lumbar Spinal Injection Workshop, “Lumbar Spinal Injections: Indications and Techniques”, “Lumbar Spinal Injections: Drugs, Risks, and Complications”. Phoenix, AZ. 2 hrs, 48 board certified physicians.

10 September 2006. International Spine Intervention Society (ISIS), Cervical and Thoracic Spine Injection Workshop, “Cervical and Thoracic Spinal Injections: Drugs, Risks and Complications”. Memphis, TN. 1 hr. 48 board certified physicians.

6 August 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop. “Radiofrequency Neurotomy: Risks and Complications”. Boston, Massachusetts. 1 hr. 48 board certified physicians.

17 June 2006. International Spine Intervention Society –Korea and Korean Pain Society, “Lumbar Spinal Injections: Risks, Complications and Drugs”, and “Lumbar Sympathetic Blockade: Indications and Technique”, Asan Medical Center, Seoul, Korea. ~150 spine physicians.

6 May 2006. International Spine Intervention Society (ISIS), Advanced Lumbar and Thoracic Spine Injection Workshop, “Lumbar and Thoracic Spinal Injections: Drugs, Risks and Complications”. Pittsburg, Pennsylvania. 1 hr. 48 board certified physicians.

1 April 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop, “Radiofrequency Neurotomy: Risks and Complications”. Dallas, Texas. 1 hr. 48 board certified physicians.

11 March 2006. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop, “Cervical Spinal Injections: Drugs, Risks and Complications”. Orlando, Florida. 1 hr. 48 board certified physicians.

28 February 2006. University of Kansas, School of Medicine, Anesthesiology Department, Residents Lecture. “Low Back and Lumbar Radicular Pain: Diagnosis and Treatment”. Wichita, Kansas. 1.25 hrs. ~10 anesthesia residents.

4February 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop, “Radiofrequency Neurotomy: Risks and Complications”. Phoenix, Arizona. 1 hr. 48 board certified physicians.

7 January 2006. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar Spinal Injections: Drugs, Risks and Complications". Burlingame, California. 1 hr. 48 board certified physicians.

5-6 November 2005. International Spine Intervention Society (ISIS), Discography Workshop, "Discography: Drugs, Risks and Complications". Phoenix, Arizona. 1 hr. 48 board certified physicians.

1-2 October 2005. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop, "Cervical Spinal Injections: Drugs, Risks and Complications". Burlingame, California. 1 hr. 48 board certified physicians.

10-11 September 2005. International Spine Intervention Society (ISIS), Thoracic Spinal Injection Workshop, "Thoracic Spinal Injections: Drugs, Risks and Complications". Memphis, TN. 1 hr. 48 board certified physicians.

27-28 August 2005. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. "Radiofrequency Neurotomy: Risks and Complications", and Radiofrequency Neurotomy: Indications and Techniques. Memphis, TN. 1 hr, 48 board certified physicians.

27-28 August 2005. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. "Radiofrequency Neurotomy: Indications and Techniques". Memphis, TN. 8 hr, 48 board certified physicians.

6-7 August 2005. International Spine Intervention Society (ISIS), Spinal Cord Stimulation and Intrathecal Therapy Workshop. "Pumps and Stims: Matching the Modality to the Patient". Boston, Massachusetts. 1 hr. 48 board certified physicians.

24-25 June 2005. North American Spine Society (NASS), Lumbar Spine Injection Workshop, "Lumbar Steroid Epidural Injections". Memphis, TN. 30 min. ~50 neuro- and orthopaedic spine surgeons.

18-19 June 2005. International Spine Intervention Society (ISIS), Discography Workshop, "Discography: Risks and Complications", Memphis, TN, 1 hr. 48 board certified physicians.

18-19 June 2005. International Spine Intervention Society (ISIS), Discography Workshop, "Discography: Indications and Techniques", Memphis, TN, 8 hr. 48 board certified physicians.

14-15 May 2005. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop, "Lumbar Injections: Drugs, Risks and Complications". Washington DC. 1 hr. 40 board certified physicians.

14-15 May 2005. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop, "Lumbar Spinal Injections: Indications and Techniques". Washington DC. 8 hr. 40 board certified physicians.

2-3 April 2005. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop "Cervical Spinal Injections: Drugs, Risks and Complications". Dallas, Texas. 1 hr. 48 board certified physicians.

5-6 March 2005. International Spine Intervention Society (ISIS), Advanced Lumbar with Discography Workshop, "Discography: Drugs, Risks and Complications". Phoenix, Arizona. 1 hr. 48 board certified physicians.

25 February 2005. American Academy of Pain Medicine Annual Meeting. "Spinal Injections Overview: The ISIS Guidelines for Interventional Pain Procedures", Palm Springs, California. 1 hr, 100+ pain physicians.

26 February 2005. American Academy of Pain Medicine Annual Meeting. "Spinal Injections: Avoiding Complications". Palm Springs, California. 1 hr, 100+ pain physicians.

8-9 January 2005. International Spine Intervention Society (ISIS), Lumbar Spinal Injection Workshop, "Lumbar Spinal Injections: Drugs, Risks and Complications". Burlingame, California. 1 hr, 48 board certified physicians.

8-9 January 2005. International Spine Intervention Society (ISIS), Lumbar Spinal Injection Workshop, "Lumbar Spinal Injections Indications and Techniques". Burlingame, California. 8 hrs, 48 board certified physicians.

6-7 November 2004. International Spinal Injection Society (ISIS), Discography Workshop. "Discography: Drugs, Risks and Complications". Burlingame, California. 1 hr. 48 board certified physicians.

2-3 October 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, "Cervical Spinal Injections: Drugs, Risks and Complications". Atlanta, Georgia. 1 hr. 48 board certified physicians.

13-14 July 2004. Society of Pain Practice Management. Course Director, "Pain Management Update", "Cervical and Lumbar Spinal Injection Techniques", "Discography and IDET", Radiofrequency Neurotomy Techniques", Intrathecal Drug Delivery Systems", "Spinal Injections: Drugs, Risks and Complications", "Atlanto-axial Injection Technique", "Cervical Injection Techniques: Interlaminar, Transforaminal, Facet", "Caudal Epidural Technique", "Lumbar Discography", "Percutaneous Discectomy", and "Nucleoplasty Techniques", "Lumbar Injections: Interlaminar, Transforaminal, and Facet", Cambridge, Massachusetts. 6+ hrs, ~100 pain physicians.

10-11 July 2004. International Spinal Injection Society (ISIS), "Lumbar Spinal Injections: Drugs, Risks and Complications". Minneapolis, MN. 1 hr. 48 board certified physicians.

10-11 July 2004. International Spinal Injection Society (ISIS), "Lumbar Spinal Injections: Indications and Techniques". Minneapolis, MN. 8 hr. 48 board certified physicians.

19 June 2004. Kimberly-Clarke/ Bayliss Medical. Radiofrequency Workshop, Radiofrequency Neurotomy: Risks and Complications", St. Louis, Missouri. 1hr. 20 pain physicians

5-6 June 2004. International Spinal Injection Society (ISIS), Intensive Cervical Workshop. "Cervical Spinal Injections: Indications and Techniques". Memphis, TN. 1 hr. 24 board certified physicians.

22 May 2004. Smith and Nephew; IDET Training Session. "Discogenic Pain: Diagnosis and Treatment", "IDET Efficacy". University of Washington, Swedish Hospital, Seattle, Washington. 2 hrs. 10 pain physicians.

1-2 May 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Cervical Spinal Injections: Drugs, Risks and Complications". New Orleans, Louisiana. 1 hr. 48 board certified physicians.

3-4 April 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Cervical Spinal Injections: Drugs, Risks and Complications". Dallas, Texas. 1 hr. 48 board certified physicians.

6-7 March 2004. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Injection Workshop. "Thoracic-Lumbar Spinal Injections: Drugs, Risks and Complications". Phoenix, Arizona. 1 hr. 48 board certified physicians.

7-8 February 2004. International Spinal Injection Society (ISIS), Discography Workshop. "Discography: Risks and Complications". Orlando, Florida. 1 hr. 48 board certified physicians.

10-11 January 2004. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop. "Lumbar Spinal Injections: Drugs, Risks and Complications". Burlingame, California. 1 hr. 48 board certified physicians.

10-11 January 2004. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop. "Lumbar Spinal Injections: Indications and Technique". Burlingame, California. 8 hr. 48 board certified physicians.

17 October 2003. Missouri Workers Compensation Attorneys Annual Meeting. "Non- Surgical Modalities for the Treatment of Low Back and Radicular Pain". Kansas City, Missouri. 1 hr. ~100 attorneys.

13-14 September 2003. Society for Pain Practice Management. Course director. Multiple presentations on Intentional Pain. Chicago, Illinois. ~4 hrs. ~100 pain physicians.

6-7 September 2003. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Cervical Spinal Injection Techniques". Burlingame, California. 1 hr. 48 board certified physicians.

15-18 July 2003. Society for Pain Practice Management. Course director. Interventional Pain Update and Cadaver Workshop. "Cervical and Lumbar Spinal Injection Techniques", "Discography and IDET", Radiofrequency Neurotomy Techniques", Intrathecal Drug Delivery Systems", "Spinal Injections: Drugs, Risks and Complications", "Atlanto-axial Injection Technique", "Cervical Injection Techniques: Interlaminar, Transforaminal, Facet", "Caudal Epidural Technique", "Lumbar Discography", "Percutaneous Discectomy", and "Nucleoplasty Techniques", "Lumbar Injections: Interlaminar, Transforaminal, and Facet". Cambridge, Massachusetts. 5+ hrs. ~100 pain physicians.

12-13 July 2003. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Spinal Injection Workshop. "Thoracic and Lumbar Spinal Injections: Drugs, Risks and Complications". Philadelphia, Pennsylvania. 48 board certified physicians.

28-29 June 2003. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, "Cervical Spinal Injections: Drugs, Risks and Complications". Memphis, TN. 1 hr. 48 board certified physicians.

7-8 June 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop. "Lumbar Spinal Injections: Drugs, Risks and Complications". Denver, Colorado. 1 hr. 48 board certified physicians.

3-4 May 2003. International Spinal Injection Society (ISIS), Discography Workshop "Discography: Drugs, Risks and Complications". Memphis, TN. 1 hr. 48 board certified physicians.

5-7 March 2003. Society for Pain Practice Management. Course director. "Update on Spinal Cord Stimulation", "Update on Implantable Intrathecal Therapies", "Discography", "Spinal Cord Stimulation: Patient Selection",

"Spinal Cord Stimulation: Post Implant Patient Care", "Spinal Cord Stimulation: Hardware", "Discography and IDET: Techniques", "Spinal Cord Stimulation: The Role of the Pain Management Physician". Phoenix, Arizona. 5 hrs. ~100 pain physicians.

1-2 March 2003. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Cervical Spinal Injections: Drugs, Risks and Complications. Orlando, Florida. 1 hr. 48 board certified physicians.

1-2 February 2003. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Spinal Injection

Workshop. "Thoracic and Lumbar Spinal Injections: Drugs, Risks and Complications". Phoenix, Arizona. 1 hr. 48 board certified physicians.

1-2 February 2003. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Spinal Injection Workshop. "Thoracic and Lumbar Spinal Injections: Indications and Techniques". Phoenix, Arizona. 8 hr. 48 board certified physicians.

12 January 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop. "Lumbar Spinal Injections: Drugs, Risks and Complications". Burlingame, California. 1 hr. 48 board certified physicians.

20-22 November 2002. Course director. Society for Pain Practice Management. Interventional Pain Update and Cadaver Course, "Principles and Practice of Diagnostic Injections", Medial Branch vs. Intra-articular Facet Blocks", "Discography: Principles and Practice", "Discography: Cervical and Lumbar", "Spinal Cord Stimulation: Patient Selection", "Spinal Cord Stimulation: Indications and Contraindications", "Spinal Cord Stimulation: Implantation Techniques", "Spinal Cord Stimulation: Post Implantation Management", "Spinal Cord Stimulation: Hardware", "Nucleoplasty and IDET", "Adding Myelography to Your Practice". New Orleans, La. ~5 hrs. ~100 pain physicians.

19 October 2002. Smith and Nephew; IDET Training Session. "IDET: Patient Selection and Technique". St. Louis, Mo. 1 hr. ~20 pain physicians.

4-6 October 2002. International Spinal Injection Society. Radiofrequency Workshop, "Radiofrequency Neurotomy: Risks and Complications", Memphis, TN. 1 hr, 48 Board certified physicians.

20-22 September 2002. Course director. Society for Pain Practice Management. Interventional Pain Update and Cadaver Course, "Principles and Practice of Diagnostic Injections", Medial Branch vs. Intra-articular Facet Blocks", "Discography: Principles and Practice", "Discography: Cervical and Lumbar", "Spinal Cord Stimulation: Patient Selection", "Spinal Cord Stimulation: Indications and Contraindications", "Spinal Cord Stimulation: Implantation Techniques", "Spinal Cord Stimulation: Post Implantation Management", "Spinal Cord Stimulation: Hardware", "Nucleoplasty and IDET", "Adding Myelography to Your Practice". Kansas City, MO. 5+ hrs, ~100 pain physicians.

3-4 Aug 2002. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, "Cervical Spinal Injections: Risks and Complications", Chicago, IL, 1 hrs, 48 Board certified physicians.

19-23 July 2002. Society for Pain Practice Management. Approximately 15 presentations on Interventional Pain, Boston, MA. 7 hrs. ~100 pain physicians.

4-5 May 2002. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, "Lumbar Injections: Indications and Techniques", New Orleans, LA. 1 hr. 48 board certified physicians.

6-7 April 2002. International Spinal Injection Society (ISIS), Discography Workshop, "Discography: Risks and Complications", Phoenix, AZ. 1 hr. 48 board certified physicians.

14-15 March 2002. Society for Pain Practice Management, ~5 individual presentations on Interventional Pain, Phoenix, AZ. ~3 hrs. ~100 pain physicians.

9-10 March 2002. International Spinal Injection Society (ISIS), "Cervical Spinal Injections: Indications and Techniques", Dallas, TX. 1 hr. 48 board certified physicians.

Teaching: Nondidactic (e.g.: workshops, labs and discussion groups)

16-17 April 2011. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Interlaminar Epidural Access”. New Orleans, LA. 10 hr. 48 board certified physicians.

8-9 January 2011. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop “Lumbar Interlaminar Epidural Access”. Las Vegas, Nevada. 2 hr. 48 board certified physicians.

21-22 August 2010. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Interlaminar Epidural Access”. Memphis, TN, 10 hrs. 48 board certified physicians.

20-21 March 2010. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Cervical Epidural Access”. Las Vegas, Nevada, 10 hrs. 48 board certified physicians.

29-30 January 2010. Course Director, International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar transforaminal Access”, “Interlaminar Epidural Access”. Phoenix, Arizona. 3 hrs. 48 board certified physicians.

25-26 October 2009, International Spine Intervention Society-Europe (ISIS-Europe), Cervical Spine Workshop. “Atlanto-axial, C1-2 Injection”, Westfälische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 10 hrs, 28 board-certified physicians.

11-12 September 2009. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Atlanto-axial, C1-2 Injection”. Memphis, TN. 12 hr. 48 board certified physicians.

21-22 August 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “L5 Transforaminal Access”. Burr Ridge, Illinois. 12 hrs. 48 board certified physicians.

20-21 June 2009. International Spine Intervention Society (ISIS), Intensive Spine Injection Workshop. “Cervical Discography”, “Cervical Transforaminal Access”, and “Cervical-Thoracic Sympathetic Ganglion Injection”. Memphis, TN. 14 hrs. 48 board certified physicians.

3-4 April 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Transforaminal Access” and Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Plano, Texas. 12 hrs. 48 board certified physicians.

20-21 February 2009. International Spine Intervention Society (ISIS), Discography Workshop. “Thoracic Discography”, Spartanburg, S.C. 12 hrs. 48 board certified physicians.

5-6 February 2009. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. “Cervical Transforaminal Access” and Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Phoenix, Arizona. 12 hrs. 48 board certified physicians.

9-10 January 2009. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. “Lumbar Transforaminal Access” and Instruction in fluoroscopic anatomy and needle placement utilizing

cadavers. San Francisco, California. 12 hrs. 48 board certified physicians.

1-2 November 2008, International Spine Intervention Society, Radiofrequency Procedures of the Spine Workshop, "Radiofrequency Neurotomy of the L2-L4 Medial Branches". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Phoenix, Arizona. 12 hrs, 48 board-certified physicians.

25 October 2008, International Spine Intervention Society-Europe (ISIS-Europe), Discography Workshop. "Thoracic Discography". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Westfälische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 10 hrs, 28 board-certified physicians.

4-5 October 2008. International Spine Intervention Society (ISIS), Discography Workshop."Lumbar Discography". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Medical Education and Research Institute of Nevada, in Las Vegas, Nevada, 10 hrs, 48 board-certified physicians.

6-7 September 2008. . International Spine Intervention Society (ISIS), Lumbar Spinal Injections Workshop. "Lumbar Spine: Imaging for Interventional Pain Procedures" and "Lumbar Transforaminal Injections". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers.. Medical Education Research Institute, Memphis, Tennessee. 13 hrs, 48 board-certified physicians.

9-10 August 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. "Radiofrequency Neurotomy of the L5 Dorsal Ramus". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Spine Masters Education Center, Burr Ridge, Illinois, 10 hr, 48 board certified physicians.

21-22 June 2008. International Spine Intervention Society-European Chapter, Cervical Spine Injection Workshop, "Axial-Atlanto, C1-2, Injections". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. University of Bristol, Bristol, UK 10 hrs. ~36 Board Certified Physicians.

6-7 June 2008. International Spine Intervention Society (ISIS), Cervical Spinal Injection Workshop. "Cervical Foraminal Access". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Memphis, Tennessee. 10 hrs, 48 board certified physicians.

31 May 2008. Korean Spine Intervention Society. "Lumbar Transforaminal Injections"; "S1 Transforaminal Injections"; "Lumbar Medial Branch Blocks"; Lumbar Radiofrequency Neurotomy"; "Caudal Injections". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Korea University Medical Center, Seoul, Korea. 8hrs., ~50 Neurosurgeons and Psychiatrists.

5-6 April 2008. International Spine Intervention Society (ISIS), Radiofrequency Neurotomy Workshop. "L2-L4 Medial Branch Radiofrequency Neurotomy". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Plano, Texas. 10 hrs. 48 board certified physicians.

8-9 March 2008. International Spine Intervention Society (ISIS), Discography Workshop. "Lumbar Discography". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Orlando, Florida. 10 hrs. 48 board certified physicians.

9-10 February 2008. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop. "Cervical Foraminal Access". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Phoenix, Arizona. 10 hrs. 48 board certified physicians.

19-20 January 2008. International Spine Intervention Society (ISIS), Lumbar Spine Injection Workshop. "Lumbar Foraminal Access". Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. San Francisco, California. 10 hrs. 48 board certified physicians.

28-29 October 2007. International Spine Intervention Society-Europe. Radiofrequency Workshop. Cervical Medial Branch Radiofrequency Neurotomy. Instruction in fluoroscopic anatomy and needle placement utilizing cadavers. Westfalische Whilhelms University, Muenster Institut Anatomie, Muenster, Germany, 8 hours. 36 board certified physicians from Europe, Asia and Middle East.

13-14 October 2007. International Spine Intervention Society. Radiofrequency Workshop. Lumbar radiofrequency neurotomy. Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, Arizona. 10 hrs. ~48 Board Certified Physicians

9 September 2007. International Spine Intervention Society, Lumbar Spine Injection Workshop, Diagnostic Injections of the medial branches of the primary dorsal rami in the lumbar spine, Memphis, TN. 8 hr. ~48 Board Certified Physicians.

4-5 August 2007. International Spine Intervention Society, Cervical Spine Injection Workshop, "Atlanto-axial, C1-2 Injection", Instruction in needle placement utilizing cadavers and fluoroscopy. Charlotte, North Carolina. 48 hr. ~48 Board Certified Physicians.

16-17 June 2007. International Spine Intervention Society-European Chapter, Advanced Lumbar Spine Injection Workshop, "Sacroiliac Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. University of Bristol, Bristol, UK, 8 hrs. ~48 Board Certified Physicians

10 June 2007. International Spine Intervention Society- Korean Chapter, Spine Intervention Workshop "Thoracic Transforaminal Injection and Thoracic Discography: Indications and Technique", Instruction in needle placement utilizing cadavers and fluoroscopy. Korea University Medical Center, Seoul, Korea. 8 hrs. ~50 Board certified physicians

5-6 May 2007. International Spine Intervention Society (ISIS), Advanced Lumbar Spine Injection Workshop, "Lumbar Discography", Instruction in needle placement utilizing cadavers and fluoroscopy. Minneapolis, MN. 8 hr. 48 board certified physicians.

31 March-1 April 2007, International Spine Intervention Society, "Lumbar Medial Branch Radiofrequency Neurotomy", Instruction in needle placement utilizing cadavers and fluoroscopy. Dallas, TX. 8 hrs. 48 board certified physicians

10-11 March 2007, International Spine Intervention Society, Discography Workshop, "Thoracic Discography", Instruction in needle placement utilizing cadavers and fluoroscopy. Orlando, FL. 8 hr. 48 board certified physicians.

6-7 January 2007, International Spine Intervention Society, Lumbar Spine Injection Workshop, "Lumbar Transforaminal Injection", Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, CA. 8 hrs. 48 board certified physicians.

4-5 November 2006. International Spine Intervention Society (ISIS), Advanced Lumbar Spinal Injection Workshop, "Lumbar Sympathetic Blockade", Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, AZ. 8 hrs, 48 board certified physicians.

9-10 September 2006. International Spine Intervention Society (ISIS), Cervical and Thoracic Spine Injection Workshop, "Atlanto-axial, C1-2, Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hr. 48 board certified physicians.

6-7 August 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop. "Third Occipital Nerve Neurotomy". Instruction in needle placement utilizing cadavers and fluoroscopy. Boston, Massachusetts. 8 hr. 48 board certified physicians.

18 May 2006. International Spine Intervention Society – Korea. Lumbar Spine Injection Workshop. "Lumbar Sympathetic Blockade", Instruction in needle placement utilizing cadavers and fluoroscopy. University of Korea Medical Center, Seoul, Korea.

6-7 May 2006. International Spine Intervention Society (ISIS), Advanced Lumbar and Thoracic Spine Injection Workshop, "Thoracic Transforaminal Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Pittsburg, Pennsylvania. 8 hr. 48 board certified physicians.

1-2 April 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop, "Third Occipital Nerve Neurotomy". Instruction in needle placement utilizing cadavers and fluoroscopy. Dallas, Texas. 8 hr. 48 board certified physicians.

25-26 March 2006. International Spine Intervention Society- Europe, Cervical Spine Injection Workshop, "Lumbar Transforaminal Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Universitat Wien (University of Vienna), Vienna, Austria. 8 hr. 48 board certified physicians and spine surgery fellows.

11-12 March 2006. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop, "Atlanto-axial, C1-2, Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Orlando, Florida. 8 hr. 48 board certified physicians.

4-5 February 2006. International Spine Intervention Society (ISIS), Radiofrequency Workshop, "Third Occipital Nerve Neurolysis". Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, Arizona. 8 hr. 48 board certified physicians.

5-6 November 2005. International Spine Intervention Society (ISIS), Discography Workshop, "Thoracic Discography". Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, Arizona. 8 hr. 48 board certified physicians.

29-30 October 2005. International Spine Intervention Society- Europe, Radiofrequency Neurotomy Workshop, "Cervical Medial Branch Neurotomy". Instruction in needle placement utilizing cadavers and fluoroscopy. Westfälische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany. 8 hr. 48 board certified physicians.

1-2 October 2005. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop, "Atlanto-axial, C1-2 injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, California. 8 hr. 48 board certified physicians.

10-11 September 2005. International Spine Intervention Society (ISIS), Thoracic Spinal Injection Workshop, “Thoracic Transforaminal Injection”, Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hr. 48 board certified physicians.

6-7 August 2005. International Spine Intervention Society (ISIS), Spinal Cord Stimulation and Intrathecal Therapy Workshop. Implantation Techniques for Spinal Cord Stimulation: Fluoroscopic insertion and surgical anchoring”. Instruction in needle placement utilizing cadavers and fluoroscopy. Boston, Massachusetts. 8 hr. 48 board certified physicians.

24-25 June 2005. North American Spine Society (NASS), Lumbar Spine Injection Workshop, Instruction on multiple lumbar spine injections. Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 30 min. ~50 “neuro and ortho” spine surgeons.

2-3 April 2005. International Spine Intervention Society (ISIS), Cervical Spine Injection Workshop “Atlanto-axial, C1-2 Injection”. Instruction in needle placement utilizing cadavers and fluoroscopy. Dallas, Texas. 8 hr. 48 board certified physicians.

19-20 March 2005. International Spine Intervention Society- Europe, Cervical Spine Injection Workshop, “Atlanto-axial, C1-2 Injection”. Instruction in needle placement utilizing cadavers and fluoroscopy. University of Munich, Munich, Germany. 8 hr. 48 board certified physicians

5-6 March 2005. International Spine Intervention Society (ISIS), Discography Workshop, “Lumbar Discography”. Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, Arizona. 8 hr. 48 board certified physicians.

6-7 November 2004. International Spinal Injection Society (ISIS), Discography Workshop. “Thoracic Discography”. Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, California. 8 hr. 48 board certified physicians.

16-17 October 2004. International Spinal Injection Society (ISIS), Radiofrequency Workshop, “Radiofrequency Neurotomy of the lumbar zygapophyseal joints”. Instruction in needle placement utilizing cadavers and fluoroscopy. Westfälische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany. 8 hr. 48 board certified physicians.

2-3 October 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, “Atlanto-axial, C1-2, Injections”. Instruction in needle placement utilizing cadavers and fluoroscopy. Atlanta, Georgia. 8 hr. 48 board certified physicians.

13-14 July 2004. Society for Pain Practice Management. Course Director, “Interventional Pain Update and Cadaver Course”. Instructed on ~15 Interventional Pain procedures. Instruction in needle placement utilizing cadavers and fluoroscopy. Cambridge, Massachusetts. 10+ hrs, ~100 pain physicians.

19 June 2004. Kimberly-Clarke/ Bayliss Medical. Radiofrequency neurotomy of the Lumbar Zygapophyseal joints”, Instruction in needle placement utilizing cadavers and fluoroscopy, St. Louis, Missouri. 1hr. 20 pain physicians

5-6 June 2004. International Spinal Injection Society (ISIS), Intensive Cervical Workshop, All cervical Interventional Pain Procedures including; Transforaminal, Medial Branch, Atlanto-axial, Zygapophyseal joint,

Interlaminar, and Intradiscal Injections, and Radiofrequency neurotomy. Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hr. 24 board certified physicians.

22 May 2004. Smith and Nephew; IDET Training Session. Placement of the IDET Intradiscal Catheter. Instruction in needle-catherter placement utilizing cadavers and fluoroscopy. University of Washington, Sweedish Hospital, Seattle, Washington. 4 hrs. 10 pain physicians.

1-2 May 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Atlanto-Axial, C1-2, Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. New Orleans, Louisiana. 8 hr. 48 board certified physicians.

3-4 April 2004. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. "Stellate Ganglion Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Dallas, Texas. 8 hr. 48 board certified physicians.

6-7 March 2004. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Injection Workshop. "Thoracic Transforaminal Injections". Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, Arizona. 8 hr. 48 board certified physicians.

7-8 February 2004. International Spinal Injection Society (ISIS), Discography Workshop. "Thoracic Discography". Instruction in needle placement utilizing cadavers and fluoroscopy. Orlando, Florida. 8 hr. 48 board certified physicians.

1-2 November 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, "Lumbar Transforaminal Injections". Instruction in needle placement utilizing cadavers and fluoroscopy. University of Muenster, Muenster, Germany. 8 hr. 48 board certified physicians.

15-18 July 2003. Society for Pain Practice Management. Course director. Interventional Pain Update and Cadaver Workshop. Instruction on 15+ Interventional Pain procedures. Instruction in needle placement utilizing cadavers and fluoroscopy. Cambridge, Massachusetts. 12+ hrs. ~100 pain physicians

12-13 July 2003. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Spinal Injection Workshop. "Thoracic Transforaminal Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Philadelphia, Pennsylvania. 8 hrs, 48 board certified physicians.

28-29 June 2003. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, "Atlanto-axial, C1-2, Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hr. 48 board certified physicians.

7-8 June 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop. "Sacroiliac Injection". Instruction in needle placement utilizing cadavers and fluoroscopy. Denver, Colorado. 8 hr. 48 board certified physicians.

3-4 May 2003. International Spinal Injection Society (ISIS), Discography Workshop. Thoracic discography. Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hr. 48 board certified physicians.

5-6 April 2003. International Spinal Injection Society (ISIS), Intensive Lumbar Workshop. Cadaveric and fluoroscopic instruction on any cervical procedure. Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 12 hrs. 24 board certified physicians.

5-7 March 2003. Society for Pain Practice Management. Course director. "Update on Spinal Cord Stimulation", Instruction in needle placement, spinal cord stimulator lead placement, and surgical anchoring techniques utilizing cadavers and fluoroscopy. Phoenix, Arizona. 12+ hrs. ~100 pain physicians.

1-2 March 2003. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop. Atlanto-axial, C1-2, Injection. Instruction in needle placement utilizing cadavers and fluoroscopy. Orlando, Florida. 8 hr. 48 board certified physicians.

11-12 January 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, Transforaminal Lumbar Injections. Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, California. 1 hr. 48 board certified physicians.

20-22 November 2002. Course director. Society for Pain Practice Management. Interventional Pain Update and Cadaver Course. Instructed on ~15 Interventional Pain procedures. Instruction in needle placement utilizing cadavers and fluoroscopy. New Orleans, La. ~12+ hrs. ~100 pain physicians.

19 October 2002. Smith and Nephew; IDET Training Session. Intradiscal Electrothermal Annuloplasty. Instruction in needle and electrode placement utilizing cadavers and fluoroscopy. St. Louis, Mo. 4 hr. ~20 pain physicians.

4-6 October 2002. International Spinal Injection Society. Radiofrequency Workshop, "Radiofrequency Neurotomy: of the Lumbar Zygapophysial Joints", Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 1 hr, 48 Board certified physicians.

20-22 September 2002. Society for Pain Practice Management. Course director. Interventional Pain Update and Cadaver Course. Instructed on ~15 Interventional Pain procedures. Instruction in needle placement utilizing cadavers and fluoroscopy. Kansas City, MO. 12+ hrs, ~100 pain physicians.

3-4 Aug 2002. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop, "Atlanto-axial, C1-2, Injections", Instruction in needle placement utilizing cadavers and fluoroscopy. Chicago, IL. 8 hrs, 48 Board certified physicians.

19-23 July 2002. Society for Pain Practice Management. Interventional Pain Cadaver Course, Instructed on ~10 Interventional Pain procedures, Instruction in needle placement utilizing cadavers and fluoroscopy. Boston, MA. 10+ hrs. ~100 pain physicians.

13-14 July 2002. International Spinal Injection Society (ISIS), Radiofrequency Neurotomy Workshop, "Intradiscal Electrothermal Annuloplasty (IDET)", Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, CA. 8 hrs. 48 board certified physicians.

4-5 May 2002. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, "Sacroiliac Injection", Instruction in needle placement utilizing cadavers and fluoroscopy. New Orleans, LA. 8 hrs. 48 board certified physicians.

6-7 April 2002. International Spinal Injection Society (ISIS), Discography Workshop, "Lumbar Discography", Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, AZ. 1 hr. 48 board certified physicians.

14-15 March 2002. Society for Pain Practice Management, Interventional Pain Workshop, Cadaveric/fluoroscopy instruction on multiple pain procedures, Instruction in needle placement utilizing cadavers and fluoroscopy. Phoenix, AZ. ~8 hrs. ~100 pain physicians.

9-10 March 2002. International Spinal Injection Society (ISIS), Cervical Spinal Injection Workshop “Atlanto-axial, C1-2, Injections”, Instruction in needle placement utilizing cadavers and fluoroscopy. Dallas, TX. 8 hrs. 48 board certified physicians.

9-10 February 2002. International Spinal Injection Society (ISIS), Advanced Lumbar-Thoracic Spinal Injection Workshop, “Thoracic Transforaminal Injections”, Instruction in needle placement utilizing cadavers and fluoroscopy. Chicago, IL. 8 hrs. 48 board certified physicians.

5-6 January 2002. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, “Lumbar Transforaminal Injection”, Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, CA. 8 hrs. 48 board certified physicians.

13-14 October 2001, International Spinal Injection Society, Discography Workshop, “Thoracic Discography”, Instruction in needle placement utilizing cadavers and fluoroscopy. Memphis, TN. 8 hrs. 48 board certified physicians.

11-12 August 2001, International Spinal Injection Society, Thoracic Spinal Injection Workshop, “Thoracic Transforaminal Injections”, Instruction in needle placement utilizing cadavers and fluoroscopy. Kansas City, MO. 8 hrs, 48 board certified physicians.

5-6 May 2001, International Spinal Injection Society, Lumbar Spinal Injection Workshop, Lumbar Transforaminal Injections, Instruction in needle placement utilizing cadavers and fluoroscopy. New Orleans, LA. 8 hrs, 48 board certified physicians.

13-14 January 2001, International Spinal Injection Society, Lumbar Spinal Injection Workshop “Sacroiliac Joint Injection”, Instruction in needle placement utilizing cadavers and fluoroscopy. Burlingame, CA. 8 hrs. 48 Board certified physicians

Teaching Clinical:

Note- If my practice were not available, the KU residents would need to leave the state for comparable training.

<u>Year</u>	<u>Hours</u>	<u>Student No</u>	<u>Type</u>	<u>Length of Service</u>
2008-2011	~600	4	senior residents	1 month each
2007	~300	2	senior anesthesia residents	1 month each
2006	~300	2	senior anesthesia residents	1 month each

Other teaching activities

<u>Date</u>	<u>Title</u>	<u>Place</u>	<u>Teaching function</u>
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1997-1999	Assistant Clinical Professor School of Medicine	Southern Illinois University- residents, fellows	Medical students,
1990-92	Adjunct Clinical Assistant Prof	KU, School Nurse Anesthesia	CRNA Clinical Program
1987-90	Chief of and Staff Anesthesiologist	USAF Regional Hospital, Elmendorf AFB, AK	Anesthesia and airway management USAF dentists

Development of Educational Materials

The following involved the development of standardized courses for the teaching of Interventional Pain to board certified “spine specialists” including but not limited to anesthesiologists, physiatrists, neurosurgeons, orthopaedic surgeons, neurologists, and radiologists. This work included standardization of lectures and spine injection procedure technique instruction. Syllabi, lecture materials, and instructional DVDs were produced.

<u>Year</u>	<u>Title Description</u>	<u>Intended Audience</u>
2005-2010 Competency Examination	ISIS Interventional Procedure Physicians- International	Board Certified Interventional Pain
2004-2010 Instructor Examination	ISIS Perspective Interventional Pain International	Applicants for instructor positions-
2003-2010	Lumbar Phase I Cadaver Workshop	Board Certified “spine” specialists
2003-2010	Advanced Lumbar Cadaver Workshop	Board Certified “spine” specialists
2003-2010	Cervical Cadaver Workshop	Board Certified “spine” specialists
2003-2008	Thoracic Cadaver Workshop	Board Certified “spine” specialists
2003-2010	Radiofrequency neurotomy Workshop	Board Certified “spine” specialists
2003-2010	Discography Workshop	Board Certified “spine” specialists
2003-2006	Spinal cord Stimulation and Intrathecal therapies Workshop	Board Certified “spine” specialists

Educational Leadership

2009-present. As an Ad Hoc Member the International Spine Intervention Society board of directors, I have continued pursuing the goals of elevating the standards of spine care in the U.S. and abroad through development and improvement in educational workshops and written practice guidelines and standards.

2008-2009. As Immediate Past president of the International Spine Intervention Society, I have continued to be a major component of the Education Committee. I have acted as course director when the current Education Committee Chairman was not present. I have continued to play an active role in the selection, training, and evaluation of prospective and existing instructors within the US and abroad. I have rewritten the didactic lectures for all of the Spinal Injection workshops, and continue the development of new instructional guidelines and materials. As ISIS International Liaison continued to help with the development of Interventional Pain workshops in Asia and Europe.

2006-2008. As Chairman of the Board of Directors and President of the International Spine

Intervention Society, I continued as an active member of the Education Committee. During this time, we instituted new stricter requirements for instructors within ISIS, in order to improve our educational programs. I acted as course director when the current Education Committee Chairman was not present. During this time, we developed new instructional guidelines and teaching materials. Several trips to Europe and Asia were made to enhance the spine intervention educational programs in these regions. I was instrumental in the planning of the ISIS 15th and 16th annual scientific meetings, as well as meetings in Antwerp, Seoul, and Porto.

2004-2006. International Spine Intervention Society. Chairman Education Committee. Overall responsibility for 12+ Interventional Pain workshops per year, in USA and abroad, with supervision of the 8 instructors per course. Responsibility for selection, training, and evaluation of all ISIS instructors. Development of guidelines, and incorporation of new procedures and new technology into the ISIS curriculum. Assistance with organization of the Annual Scientific, and the semi-annual European Scientific meetings. Instrumental in helping to initiate interventional pain workshops in Europe and Asia. Discussions with other medical specialty societies (American Academy of Pain Medicine, World Institute of Pain, and American Society for Interventional Pain Physicians) regarding training in interventional pain management.

2002-2004. Society for Pain Practice Management. Course director. Responsible for organizing the courses and supervising ~15 faculty instructing Interventional Pain procedures to ~100 Pain Management physicians. 3-4 courses per year.

SERVICE ACTIVITIES:

Professional Service:

As one of only two interventional pain specialist physician in Kansas, and perhaps one of 4-6 in the region, Offering comprehensive non-surgical spine-interventional pain services; i.e. all diagnostic and therapeutic procedures on all regions of the spine between foramen magnum and coccyx. Full time non-surgical spine/interventional pain practice. 150-200 fluoroscopically guided procedures per month. Regional referral source for spinal diagnostics and minimally invasive spine therapy. In the past years I have seen patients from Wyoming, Utah, Nebraska, Colorado, Missouri, Arkansas, Illinois and Oklahoma.

Telephone and e-mail consultations with physicians regarding spinal diagnostics and treatments national and international.

Consultant for the United States Federal Bureau of Investigation and Office of the U.S. Attorney General concerning fraud and abuse in interventional pain management.

Wesley Medical Center, Wichita, Kansas. Interventional Pain Privileges Committee. Review credentials of physicians requesting Interventional Pain privileges.

National leader concerning the problem of poorly, or partially trained, physicians performing potentially life threatening spinal procedures.

National leader concerning the problem of non-physicians practicing the medical specialty of Interventional Pain.

Academic Service:

Note: The International Spine Intervention Society, ISIS, is the largest interdisciplinary medical specialty group of board certified physicians whose primary interest lies in the use of minimally invasive procedures for the diagnosis and treatment of pain of spinal origin. ISIS was originally organized in 1991, "To provide a forum in which interdisciplinary professionals can communicate". It is "...dedicated to scientific research, education, and training of physicians in spinal injection procedures for the treatment of diseases involving or resulting from disorders of the spine" and was "...formed exclusively for scientific and educational purposes." In regards to education ISIS is regarded as the "gold standard" by which all other organizations are judged. ISIS members, and research grant support, have provided the seminal literature concerning the pertinent anatomy, and efficacy of the minimally invasive spine procedures upon which the specialty of Interventional Pain is based. Membership in ISIS is limited to board certified physicians specializing in spine care, especially minimally invasive, non-surgical spine interventions. At the present time ISIS is composed of >3,000 spine specialists whose initial training was in anesthesiology, physiatry, radiology, neurosurgery, orthopaedic surgery, neurology, and other specialties.. ISIS is an international organization with members on all continents, except Antarctica, with chapters in Europe, Germany, Korea, and Australia/New Zealand. ISIS is represented at the national level in the AMA House of Delegates, as well as on the RUC and CPT committees. I.S.I.S. is an integral part of several multispecialty coalitions comprised of national organizations promoting spine medicine.

International Spine Intervention Society: Ad hoc member of the board of directors. Continued work and leadership in the areas of non-surgical spine care through education, practice guidelines, and standards of practice.

International Spine Intervention Society: Immediate Past President, Member Board of Directors and Executive committee. International Liaison. Member Education Committee. As past president, to act as advisor to the present president. Continued input in regards to major decisions and trends within the society as a member of the above noted groups. 2008-2009

International Spine Intervention Society: President of Society, member of the Board of Directors, and Executive Committee. Responsibility for the overall operation and guidance of the society. Preside over all board of director meetings and business meetings. A member of all standing committees; research, education, standards, annual meeting, and socioeconomic. Input into the AMA house of delegates via the ISIS representative, as well as RUC and CPT committees. Interaction and discussions with other medical specialty groups, and government agencies involved with spine care and pain management within the USA and abroad. Have maintained a strong presence in the educational aspects of the society. 2006-2008

Interventional Spine Intervention Society: Member Executive Board and Secretary of the Society. As a member of the executive board, I had responsibility for decisions involving the finances, managing the property and conducting the business of the society. This included evaluating; research proposals and allocating monies to such; educational programs; and significant societal position statements dealing with interventional pain issues. As secretary, I had sole responsibility for maintaining all records of the organization. 2004-2006

International Spine Intervention Society: Chairman Education Committee. Overall responsibility for ~12 Interventional Pain workshops per year, in USA and abroad, with supervision of the 8 instructors per course. Responsibility for selection, training, and evaluation of all ISIS instructors. Development of guidelines, and incorporation of new procedures and new technology into the ISIS curriculum. Assistance with organization of the Annual Scientific, and the semi-annual European Scientific meetings. Instrumental in helping to initiate interventional pain workshops in Europe and Asia. Discussions with other medical specialty societies (American Association of Pain Medicine, World Institute for Pain, and American Society for Interventional Pain Physicians, Korean Pain Society) regarding training in interventional pain management. 2004-2006.

International Spine Intervention Society: Instructor cadaver workshops. Significant contribution teaching ~12 interventional pain workshops per year. All levels of instruction beginning to advanced, all procedures for cervical, thoracic, lumbar and sacral. 2001-present.

International Spinal Injection Society: Education Committee. Worked to develop standardized educational materials for the teaching of interventional pain procedures. 2003-2004

International Spinal Injection Society: Standards Committee. Tasked to develop standards for the performance of spinal interventions, and assessment of new modalities as to evidence of efficacy. 2003-2004

American Osteopathic College of Anesthesia: Residency “In Training Examination” committee. Member of a committee to formulate a standardized examination, to assess the progress of anesthesia residents during training. 1995

Board of Trustees, Alaska Osteopathic Medical Association: Founding member. One of the founding members of a society to provide CME and professional representation for Osteopathic Physicians in Alaska. 1989-1990.

Research and Scholarly Activities

Current projects:

Landers MH, Dreyfuss P, Bogduk N. On the geometry of fluoroscopic views for cervical interlaminar injections. *Pain Medicine*. Submitted and accepted for publication with slight revision.

Landers MH, Jones RL. Has the first case of “Air Myelopathy Following a Cervical Epidural Injection” occurred? *Pain Medicine*. Submitted and accepted for publications with revision.

Revision for second edition of *Practice Guidelines: Spinal Diagnostic and Treatment Procedures*, ed. Nikolai Bogduk.

Systematic Literature Review of “Lumbar transforaminal injections” for submission to *Pain Medicine*.

Revision for second edition of *Fluoroscopy Manual for Pain Management*, ed. Tina Best.

Scholarly Publications: Articles published. Peer reviewed.

Jones RL, **Landers MH**. A rare case of paraplegia complicating a lumbar epidural infiltration. *Ann Phys Rehabil Med* (2011) In the Press. Letter to Editor

Landers M. Comments on: Penetration of a Cervical Radicular Artery during a Transforaminal Epidural Injection. *Pain Medicine* 11: 1306-1307 (2010). Letter to Editor.

Landers M. Indications of Spinal Injections for Chronic Pain. *Pain Medicine* 9: 5-10s, (2008).

Bogduk N, Dreyfuss P, Baker R, Yin W, **Landers M**, Hammer M, April C.
Complications of spinal diagnostic and treatment procedures. *Pain Medicine*. 9:s11-34, (2008).

Waldman, S.D., G.S.Feldstein, M.L. Allen, **M.H. Landers**, and G. Turnage. Cervical implantable narcotic delivery systems in the management of upper body cancer pain. *Anesthesia and Analgesia* 66:780-782(1987).

Wilson, T.G., **M.H. Landers**, and G. M. Happ. Precocene I and II inhibition of vitellogenic oocyte development in *Drosophila melanogaster*. *J. Insect Physiology* 29:249-254(1983).

Black, P.M., **M. H. Landers**, and G.M. Happ. Cytodifferentiation in the Accessory Glands of *Tenebrio Molitor*. VIII. Crossed immunoelectrophoretic analysis of terminal differentiation in the postecdysial tubular accessory glands. *Developmental Biology* 94:106-115(1982).

Landers, M.H. and G.M. Happ. Precocene inhibition of vitellogenesis in *Drosophila melanogaster*. *Experientia* 36:619(1980).

Landers, M.H. and G.M. Happ. The effects of the precocenes on vitellogenesis and other juvenile hormone related processes in *Drosophila melanogaster*. *American Zoologist* 19:917(1979).

Landers, M.H., G.R.J. Law, and E. Kienholtz. The effect of dietary selenium and vitamin E on the immune response in turkeys. *Poultry Science* 54:1784(1975).

Invited or non-peer-reviewed articles or reviews:

Landers, M.H. International Spine Intervention Society: Response to ACOEM. *Interventional Spine* 6: 44-53(2008).

Landers, M.H. Spinal Injections: Risks, Complications and Drugs, (Presentation to KorSIS). *Clinical Pain* (Korea), June 2007 Supplement: pp 50-112.

Landers, M.H. Thoracic Spinal Injections: Indications and Techniques, (Presentation to KorSIS). *Clinical Pain* (Korea), June 2007 Supplement: pp 203-233.

Derby, R and **Landers, M.H.** International Spine Intervention Society: History and Philosophy, (Presentation to KorSIS), *Clinical Pain* (Korea), June 2007 Supplement: pp 50-112.

Landers, M.H. Regional Anesthesia in the Pediatric Patient. *Clinical Journal of Doctors Hospital* 3:6-12 (1991).

Book chapters:

Derby R, **Landers MH**, Wolfer LR, Kim PS. Provocation Discography: In Deer T, Kapural L, Kim P (eds), *Diagnosis, Management, and Treatment of Discogenic Pain*, Volume 3 from the *Interventional and Neuromodulatory Techniques for Pain Management Series*, Philadelphia, Elsevier, In the press.

Landers, M.H. Discography: In Waldman, S.D. (ed), *Pain Management*, 2nd Edition, Philadelphia, WB Saunders, In the press.

Vivian D, **Landers, M.H.** Discography: Intervertebral Disc Access and Stimulation: Lumbar, Thoracic, and Cervical. In Lennard, T.A. (ed), *Pain Procedures in Clinical Practice*, 3rd edition, Philadelphia, Elsevier, 2011, pp 410-410.

Landers, M.H., C Aprill. Epidural Steroid Injections: Cervical, Thoracic, and Lumbar: Transforaminal, Interlaminar, and Caudal: In Lennard, T.A. (ed), *Pain Procedures in Clinical Practice*, 3rd edition, Philadelphia, Elsevier, 2011, pp 313-356.

Derby R, Wolfer L, Lee JE, **Landers M**, Kim BJ, Lee SH. Discography (Chap.7): In Pinheiro-Franco J.L., Vaccaro A.R., Benzel E.C., Mayer H. (eds), *Conceitos Avancados em Doença Degenerativa Discal Lombar* (Advanced Concepts In Lumbar Degenerative Disk Disease), Brazil, Dilivros (publisher), 2010, p.81-108

Landers, M.H., R Jones, R Rosenthal, R Derby: Lumbar Spinal Neuroaxial Procedures. In Raj PP, L Lou, S Erdine, et al. (eds), *Interventional Pain Management: Image-Guided Procedures*, Philadelphia, Churchill Livingstone, 2008, pp 322-367.

Landers, M.H. Diskography: In Waldman, S.D. (ed), *Pain Management*, Philadelphia, WB Saunders, 2007, pp 118-144.

Published abstracts:

Landers, M.H., J.H. Postlethwait, A. Handler and J. White. Isolation and characterization of female sterile mutants in *Drosophila melanogaster*. *Genetics* 83:S43(1976).

Landers, M.H., G.R.J. Law. Selenium and Vitamin E-their effect on the immune response in turkeys. *Today's Research-Tomorrows Colorado* 88:1876(1975).

Other scholarly publications: Contributions to books and chapters:

Waldman, S.D., *Atlas of Interventional Pain Management*, 3rd Edition, Philadelphia, W B Saunders, 2009. (Contributed text and images for 23 chapters).

Waldman, S.D. (ed), *Pain Management*, 2nd Edition, Philadelphia, WB Saunders, In the press.

Opper S. Neck Pain. In Smith, H. (ed). *Current Therapy in Pain*, Philadelphia, WB Saunders, 2009, pp 145-146, Images: Figures 18-5A, B; 18-6A,B; Figure 18-7; Figure 18-8.

Hammer M, C Noe, et al. Spinal Neuroaxial Procedures of the Head and Neck. In Raj PP, L Lou, S Erdine, et al. (eds), *Interventional Pain Management: Image-Guided Procedures*, Philadelphia, Churchill Livingstone, 2008, p 157, Image 8-46.

Hammer M, C Noe, G Racz. Spinal Joint Blocks of the Head and Neck. In Raj PP, L Lou, S Erdine, et al. (eds), *Interventional Pain Management: Image-Guided Procedures*, Philadelphia, Churchill Livingstone, 2008, p 201, Images 9-19, 9-24.

Hypogastric Plexus Block and Impar Ganglion Block – Images 161-6: In Waldman, S.D. (ed), *Pain Management*, Philadelphia, WB Saunders, 2007, p 1356.

Caudal Epidural Nerve Block – Image 159-14: In Waldman, S.D. (ed), *Pain Management*, Philadelphia, WB Saunders, 2007, p 1341.

Thoracic Transforaminal Injections: Alternate approach, In Bogduk, N. (ed), *Practice Guidelines for Spinal Diagnostic and Treatment Procedures*, San Francisco, International Spine Intervention Society, 2004, 287-313.

Waldman, S.D., *Atlas of Interventional Pain Management*, 2nd Edition, Philadelphia, W B Saunders, 2004. (Contributed text and fluoroscopic images for 33 chapters and front and back covers).

Presentations at national and international meetings:

13 August 2011. International Spine Intervention Society 19th Annual Scientific Meeting. Moderator, “Treatments on trial: Cervical transforaminal injections and Lumbar Discography”, Chicago, Illinois, 2 hrs., >600 attendees.

14 July 2010. International Spine Intervention Society 18th Annual Scientific Meeting. Moderator, “The Herniated Disc: Cervical, Thoracic, Lumbar”, Maui, Hawaii, 2 hrs., >370 attendees.

25 July 2009. International Spine Intervention Society 17th Annual Scientific Meeting. Moderator, “Epidural Injections”, Toronto, Canada, 2 hrs., >350 attendees.

17 January 2009. American Osteopathic College of Anesthesia Annual Midyear Conference, “Cervicogenic Headaches: Diagnosis and Treatment”. Kansas City, Missouri, 1 hr., ~50 attendees.

25 July 2008. International Spine Intervention Society 16th Annual Scientific Meeting. Presidential Address. “Interventional Pain: ‘Raising the Bar’”. Las, Vegas, Nevada, 1 hr., >600 attendees.

24 July 2008. International Spine Intervention Society 16th Annual Scientific Meeting. “Whiplash and

Cervicogenic Headaches: Case presentation and The Opposition”; “Discography: What to do?”; “Discography: The Opposition”. Las, Vegas, Nevada, 1 hr., >600 attendees.

31 May 2008. Korean Spine Intervention Society (KorSIS). “Interventional Pain: History and Future”, “Lumbar Transforaminal Injections: Indications and Techniques”; “Lumbar Spinal Injections: Drugs, Risks, and Complications”; “Lumbar Radiofrequency Neurotomy: Theory and Technique”. Asan Medical Center, Seoul, Korea. 2 hrs., ~50 Neuro-Spine Surgeons and Physiatrists.

28 March 2008. Portuguese Spine Society, Portuguese Pain Society, Portuguese Anesthesia Society Joint Congress. DorVertebraldo Diagnostico a Therapeutica; “Cervical Radiculopathy: Diagnosis and Treatment”; “Cervical and Thoracic Discography: The Evidence”. Lisbon, Portugal. 2 hrs. ~ 100 Spine Surgeons, Radiologists, Anesthesiologists, and Physiatrists.

27 March 2008. Portuguese Spine Society, Portuguese Pain Society, Portuguese Anesthesia Society Joint Congress. DorVertebraldo Diagnostico a Therapeutica; “Interventional Pain: History and Future”, “Cervicogenic Headaches: Diagnosis and Treatment”; “Low Back Pain: Diagnosis and Treatment”. Lisbon, Portugal. 2.5 hrs. ~ 100 Spine Surgeons, Radiologists, Anesthesiologists, and Physiatrists.

2 November 2007. Kansas Association of Osteopathic Medicine. Annual Mid-year Conference. “Cervicogenic Headaches: Diagnosis and Treatment”. Wichita, Kansas.

25 June 2007. American Society of Interventional Pain Physicians, Annual Meeting. “ISIS: The Global Voice, and Conscience, of Interventional Pain”. Washington, D.C.

9 June 2007. Cervical and Thoracic Scientific Meeting, Korean Spine Intervention Society, “The International Spine Intervention Society; The Past, Present and Future of Interventional Pain”, “Cervical and Thoracic Injections: Risks, Complications, and Drugs”, and “Thoracic Spinal Injection: Indications and Techniques”. Asan Medical Center, Seoul, Korea.

27-28 April 2007. International Spine Intervention Society - Europe, Semi-Annual Scientific Meeting, “Lumbar Radiofrequency Neurotomy”, and “Cervicogenic Headaches: Diagnosis and Treatment”, Antwerp, Belgium.

7 February 2007, American Association of Pain Medicine, Annual Meeting, “Spinal Injections: Indications for Chronic Pain”, New Orleans, LA. ~150 pain physicians.

14 July 2006. International Spine Intervention Society Annual Scientific Meeting. Moderator “Spinal Cord Stimulation”. Salt Lake City, Utah. ~400 spine physicians.

22-23 February 2006. American Academy of Pain Medicine (AAPM), “Interventional Pain: A Procedural Overview with Cadaveric Demonstration”, “Spinal Injections: Drugs, Risks, and Complications”, and “Complications of Thoracic and Lumbar Spinal Injections”. San Diego, California. 8.5 hrs. Pain physicians.

21 January 2006, American Osteopathic College of Anesthesiologists, “Diagnosis and Treatment of Low Back and Lumbar Radicular Pain”, and “Radiofrequency Neurotomy: Indications and Techniques”, Kansas City, Missouri. ~50 anesthesiologists.

14-16 July 2005. International Spine Intervention Society (ISIS), Annual Scientific Meeting, Moderator: “Intradiscal Procedures”. New York City, NY. ~400 spine physicians.

9-11 September 2004. International Spinal Injection Society (ISIS) Annual Meeting, Moderator: "Lumbar Radicular Pain: Diagnosis and Treatment". Maui, Hawaii.

1-2 November 2003. International Spinal Injection Society (ISIS), Lumbar Spinal Injection Workshop, "Lumbar Spinal Injections: Drugs, Risks and Complications". University of Muenster, Muenster, Germany. 1 hr. 48 board certified physicians.

17 May 2003. Central Illinois Neuroscience Foundation. "IDET & Nucleoplasty: What, When, and Where". Bloomington, Illinois. 1 hr. ~50 pain physicians.

20 September 1989, American Osteopathic College of Anesthesiology, "Cervical Epidural Injections for the Treatment of Cervical Radiculopathy", Palm Springs, CA. 30 min. ~100 anesthesiologists.

10 April 1989, Society of Air Force Clinical Surgeons, "Cervical Epidural Injections for the Treatment of Cervical Radiculopathy", San Antonio, TX. 30 minutes. ~50 Surgical specialists.

Presentations at local and regional meetings:

22 April 2006. Kansas Association of Osteopathic Medicine. "Diagnosis and Treatment of Low Back and Lumbar Radicular Pain". Overland Park, Kansas. 1 hr. ~50 physicians all specialties.

5 December 2005. Sedgwick County Osteopathic Medical Society. "Diagnosis and Treatment of Low Back and Lumbar Radicular Pain". Wichita, Kansas. ~30 physicians all specialties.

30 April 2005. Association of Operating Room Nurses (AORN), "Interventional Pain: A New Specialty", St. Francis Hospital, Wichita, Kansas. 30 min. ~30 RNs.

2 November 2001. Greater Dallas Osteopathic Association. "Analgesics: Old and New", Dallas, TX. 1 hr. ~50 physicians all specialties.

15 March 2003. Kansas City Pain Management Update, "Spinal Cord Neuromodulation" and "Peripheral Neuromodulation for Occipital Headaches", Leawood, Kansas. 2 hrs, ~50 physicians.

10 November 2001. Kansas Association of Osteopathic Medicine. "Where Pain Pathways Converge", Topeka, KS. 1 hr. ~75 physicians all specialties.

10 October 2001, Chilicothe Medical Association, "Analgesics: Old and New", Chilicothe, MO. 1 hr. ~20 physicians all specialties.

20 November 2001, Northwest Missouri Osteopathic Association, "Analgesics: Old and New", Kansas City, MO. 1 hr. ~20 physicians all specialties.

11 September 2001, Kansas Workman's Compensation Association, "Precision Spinal Injections", Overland Park, KS.

5 September 2001, Buchanan County Medical Society, "Analgesics: Old and New", St. Joseph, MO. 1 hr. ~40 physicians all specialties.

30 August 2001, Pfizer Pharmaceuticals, "Analgesics: Old and New", Kansas City, MO. 1 hr. ~20 physicians all specialties.

28 August 2001, Henry County Medical Society, "Low Back Pain: An Update", Clinton, MO. 1 hr. ~20 physicians all specialties.

9 May 2001, Fortis Benefits, "Discogenic pain: Diagnosing and Treating", "IDET: Indications, Patient Selection, Procedure, Outcomes", Kansas City, MO. 3 hrs. ~20 physiatrists and nurses.

5-6 May 2001, International Spinal Injection Society, Lumbar Spinal Injection Workshop, "Lumbar Spinal Injections: Techniques and Indications", New Orleans, LA. 48 board certified physicians.

3 May 2001, Missouri Association of Osteopathic Physicians and Surgeons, "Where Pain Pathways Converge", Branson, MO. . 1 hr. ~30 physicians all specialties.

30 March 2001, Clay-Platt County Medical Society, "Where Pain Treatment Pathways Converge", Kansas City, MO. 1 hr. ~30 physicians all specialties.

27 March 2001, Golden Valley Hospital Medical Staff, "Where Pain Treatment Pathways Converge", Clinton, MO. 1 hr. ~30 physicians all specialties.

13 March 2001, American Society of Pain Management Nurses, "Low Back vs Radicular Pain: Diagnosis and Treatment", North Kansas City, MO. 1 hr. ~20 pain management nurses

10 October 2000, Leavenworth County Medical Society, "Analgesics: Old and New", Leavenworth, KS. 1 hr. ~30 physicians all specialties.

27 September 2000, Research Hospital Medical Staff, "Analgesics: Old and New", Kansas City, MO. 1 hr. ~30 physicians all specialties

19 September 2000, Great Plains College of Occupational Medicine, "Triaging the Pain Patient", Kansas City, MO. 1 hr. ~30 physiatrists.

14 September 2000, Missouri Association of Osteopathic Physicians and Surgeons, Western Section, "Analgesics: Old and New", North Kansas City, MO. 1 hr. ~50 physicians all specialties.

23 May 2000, Medical Center of Independence, "Where Pain Treatments Converge", Independence, MO. 1 hr. Physicians, residents and medical students.

25 April 2000, Jackson County Medical Society, "Where Pain Treatment Plans Converge", DeSoto, IL. 1 hr. ~30 physicians all specialties.

21 September 1999, McDonough County Medical Society, "Where Pain Treatments Converge", Macomb, IL. 1 hr. ~30 physicians all specialties.

2 September 1999, Illinois Pharmacists Association, "Opioid Addiction in the Pain Patient", Springfield, IL. 1hr. ~20 pharmacists.

23 April 1999, Kansas Association of Osteopathic Medicine, "Advanced Pain Management Techniques",

12 April 1999, Midwest Rehabilitation Institute, "Pain Management: Diagnostic and Treatment Options, Springfield, IL. 1 hr. ~20, Psychiatrists

20 January 1999, Coles County Medical Society, "Pharmacological Management of Chronic Pain", Matoon, IL. 1 hr, ~30 physicians of all specialties.

15 December 1998, Montgomery County Medical Society, "Pharmacological Management of Chronic Pain", Litchfield, IL. 1 hr, ~30 physicians of all specialties.

14 October 1998, Logan County Medical Society, "Pharmacological Management of Chronic Pain", Lincoln, IL. 1 hr, ~30 physicians of all specialties.

3 March 1998, Tazwell County Medical Society, "Where Pain Treatments Converge", Pekin, IL. 1 hr, ~30 physicians of all specialties.

13 October 1988, Elmendorf Regional Medical Center, "Some of My Favorite Pains", Elmendorf AFB, Anchorage, AK. 1 hr; ~30 medical providers

Invited seminars at other universities:

25 October 2009, International Spine Intervention Society-Europe (ISIS-Europe), Cervical Spine Workshop. "Cervical Spinal Injections: Risks and Complications", Westfalische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 2 hrs, 28 board-certified physicians.

25 October 2008, International Spine Intervention Society-Europe (ISIS-Europe), Discography Workshop. "Discography: Indications and Techniques", Westfalische Wilhelms University, Muenster Institut Anatomie, Munster, Germany, 2 hrs, 28 board-certified physicians.

21 June 2008. International Spine Intervention Society-European Chapter, Cervical Spine Injection Workshop, "Cervical Spinal Injections Techniques and Indications". University of Bristol, Bristol, UK 1.5 hrs. ~36 Board Certified Physicians.

27 October 2007. International Spine Intervention Society- Europe. Radiofrequency Workshop. "Radiofrequency Neurotomy: Theory". Westfalische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany.

28 October 2007. International Spine Intervention Society-Europe. Radiofrequency Workshop. "Radiofrequency Neurotomy: Risks and Complications". Westfalische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany.

9 June 2007. "Injections: Risks, Complications and Drugs"; "Thoracic Techniques"; and "Spine Intervention Society: History and Philosophy" Korean Pain Society and International Spine Intervention Society- Korean Chapter, Spine Intervention Meeting, Asan University Medical Center, Seoul, Korea. ~120 Board certified physicians, fellows and residents.

19 June 2006. "Low Back and Lumbar Radicular Pain: Diagnosis and Treatment", Department of Physical Medicine and Rehabilitation, Kyung Hee University Medical Center, Seoul, Korea. ~40 faculty, fellows and residents.

17 June 2006. International Spine Intervention Society –Korea and Korean Pain Society, “Lumbar Spinal Injections: Risks, Complications and Drugs”, and “Lumbar Sympathetic Blockade: Indications and Technique”, Asan Medical Center, Seoul, Korea. ~150 spine physicians.

25-26 March 2006. International Spine Intervention Society- Europe, Cervical Spine Injection Workshop, “Lumbar Spinal Injections: Techniques”. Universitat Wien (University of Vienna), Vienna, Austria. 1 hr. 48 board certified physicians and spine surgery fellows.

29-30 October 2005. International Spine Intervention Society- Europe, Radiofrequency Neurotomy Workshop, “Radiofrequency Neurotomy: Risks and Complications”. Westfälische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany. 1 hr. 48 board certified physicians.

19-20 March 2005. International Spine Intervention Society- Europe, Cervical Spine Injection Workshop, “Cervical Spinal Injections: Indications and Techniques”. University of Munich, Munich, Germany. 1 hr. 48 board certified physicians

16-17 October 2004. International Spinal Injection Society (ISIS), Radiofrequency Workshop, “Radiofrequency Neurotomy: Risks and Complications”. Westfälische Wilhelms University, Muenster Institut Anatomie, Muenster, Germany. 1 hr. 48 board certified physicians

Further evidence of scholarship

Published response in *Interventional Spine* to: **ACOEM Guidelines for Chronic Pain**. Concerning Interventional Pain treatment for workers injured on the job in California. National implications.

Intersociety Spine Group: Founding Member. 2008. National group composed of executive members of the major medical societies with interest in spine treatment. Includes representatives from: North American Spine Society, International Spine Intervention Society, American Orthopaedic Association, American Academy of Physical Medicine and Rehabilitation, American Association of Neuroradiologists.

Neuromodulation Treatment Access Coalition: Founding Member. 2007-2008. National organization of academics and industry dealing with acceptance, education, and reimbursement of neuromodulation modalities for the treatment of pain. Neuromodulation Ad Hoc Committee.

International Spine Intervention Society: Instructor Competency Examination. One of the primary developers of the first, and only, examination to assure the competency of instructors of interventional pain procedures. Utilized by the International Spine Intervention Society to assure the highest level of competence in their instructors for courses in the USA, Europe and Asia.

Contributor to: *Practice Guidelines: Spinal Diagnostic and Treatment Procedures*, International Spine Intervention Society. First, and most respected, evidence based guideline for the practice of interventional pain. Utilized by clinicians, residencies, fellowships, attorneys, insurance carriers, and others requiring knowledge of diagnostic and treatment algorithms involving minimally invasive procedures for pain of spinal origin.

Advisory committee for the journal *Pain Medicine*. Boulder, Colorado. 13-15 July 2007. Discussions and plans

for implementation of ways to significantly improve this highly respected, peer reviewed journal.

Spine Clinical Guideline Collaborative Project, Chicago, Illinois. 13-15 October 2006. Founding member. Discussions on development of national guidelines and standards for the diagnosis and treatment of spine pain. Organized by North American Spine Society. Included International Spine Intervention Society, American Orthopaedic Association, American Academy of Physical Medicine and Rehabilitation, and several other national medical specialty societies.

National Position Statement on: **Prerequisite Training for the Performance of Spine Interventions**. International Spine Intervention Society. Helped write and gain support for this document from several national medical societies involved with pain management and AMA.

Position Statement on: **Medical Treatment Utilization Schedule (MTUS), California's Division of Workers Compensation**. Concerning Interventional Pain treatment for workers injured on the job in California. Potential national implications.

The End