

## CURRICULUM VITAE

**NAME:** **Timothy R. Lubenow, M.D.**

**ADDRESS:** Rush University Medical Center  
 Department of Anesthesiology  
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 1725 W. Harrison, Suite 550 Professional Building 3  
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 610 South Maple Avenue, Suite 1500  
 Oak Park, IL 60304  
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 2450 S. Wolf Road  
 Suite D  
 Westchester, IL 60154

**EDUCATION:** University of Wisconsin at Milwaukee, B.S., 1979  
 Medical Sciences – Target M.D. Program  
 Medical College of Wisconsin, Milwaukee, WI, M.D., 1983

**INTERNSHIP:** Rotating, Rush University Medical Center  
 Chicago, IL 60612, 1983-1984

**RESIDENCY:** Anesthesiology, Rush University Medical Center  
 Chicago, IL 60612, 1984-1986

**FELLOWSHIP:** Pain Medicine, Rush University Medical Center July 1986-June 1987

Cardiac Anesthesia, Rush University Medical Center, July 1986-June 1987

Special Training: Fiberoptic Laryngoscopy, Pediatric Anesthesia  
 Liver and Cardiac Transplantation

**HONORS:** University of Wisconsin at Milwaukee  
 Phi Eta Sigma, 1977; Phi Beta Kappa, 1979

Chief Resident, Anesthesiology, Rush University Medical Center  
Chicago, IL 60612, July 1985-June 1987

Robert D. Dripps, M.D. Memorial Award for Outstanding Graduate  
Resident, 1986, Pillsbury Fellowship, 1986-1987

Selected for Castle Connolly Guide, *How to Find the Best Doctors:  
Chicago Metro Region*. 1999-present.

Who's Who, Selected Lifetime Member, 2000

Listed in Chicago Consumers Checkbook Magazine, *Top Doctors in  
Chicago for Anesthesiology and Pain Medicine*. 2012; 2017

Selected for "*Best Doctors in America*" 2003-2018

Selected for "*Guide to America: Top Anesthesiologist*" 2006 edits.  
Consumers' Research Council of America

Selected for "*Physician Advocacy Heroes of Neuromodulation*" 2007  
Medtronic

Invited Lecture: "22<sup>nd</sup> Annual Frederick A dePeysler Memorial Rush  
Alumnus Lecture: Preemptive Analgesia Past, Present and Future" April  
2008

Selected for "*Guide to America's Top Physicians*" 2009  
Consumers' Research Council of America

Castle Connolly Guide to "Top Doctors in the Nation" New York Times  
edition November 13, 2010

Selected for "*70 of the Best Pain Management Physicians in America.*"  
Beckers ASC Review March 23, 2011

The U.S. News Top Doctors, selected by U.S. News Media Group, a free  
searchable directory available at [www.usnews.com/top-doctors](http://www.usnews.com/top-doctors), July, 2011

Selected for "*Patients' Choice Award*" by PatientsChoice.org.  
September 2012. Awarded to top 5% of physicians by patients

"Distinguished Service Award" Illinois Society of Anesthesiology, 2013

Selected for *Chicago Super Doctors 2013*, New York Times Magazine  
September 29, 2013

Selected for "*Chicago Top Doctor's*" Chicago Magazine January 2014

Selected for “*Chicago Top Doctor’s*” Chicago Magazine January 2016

Selected as “*DRG US/Global Proctor*”. St. Jude Medical 2016  
 Training conducted at Oxford University, England January 2016

**MEMBERSHIPS:** American Society of Anesthesiologists  
 Illinois Society of Anesthesiologists  
 Chicago Society of Anesthesiologists  
 American Medical Association  
 Illinois State Medical Society  
 Chicago Medical Society  
 American Society of Regional Anesthesia and Pain Medicine  
 ASRAPM Neuromodulation Special Interest Group  
 International Association for the Study of Pain  
 American Society of Interventional Pain Physicians  
 Illinois Society of Interventional Pain Physicians  
 Rush Surgical Society  
 Association of Anesthesia Pain Program Directors  
 North American Neuromodulation Society  
 Society of Academic Anesthesia Associations – Subspecialty Program  
 Directors  
 American Society of Pain and Neuroscience

**ACADEMIC POSITIONS:** Adjunct Professor of Anesthesiology, 1987-1988  
 Assistant Professor of Anesthesiology, 1988-1995  
 Associate Professor of Anesthesiology, 1995-2004  
 Professor of Anesthesiology, Rush Medical College 2004-present

**HOSPITAL POSITIONS:** Attending Anesthesiologist  
 Rush University Medical Center 1987-present

Chair, Section of Pain Medicine  
 Department of Anesthesiology, 1993-Present

Medical Director, Rush Pain Center

Director, Postoperative Analgesia Services 1986 - August 2015

Clinical Coordinator, 1989-1998

Adjunct Attending Staff, 1987-1988

Associate Attending Staff, 1988-1997

Senior Attending Staff, 1998-Present  
Rush University Medical Center

Program Director, Pain Medicine Fellowship  
Department of Anesthesiology 1988-present

#### ELECTED OR

#### APPOINTED POSITIONS:

- Illinois Society of Anesthesiologists (ISA)
- House of Delegates, 1991-2004
  - Board of Directors, 1992-2004
  - Committee on Bylaws and Rules, 1991-1993
  - Alternate Director District One Delegates, 1991-1992
  - Director District One Delegates, 1992-1997
  - Nominating Committee, 1992-1997 & 2003-2005
  - Committee on Practice of Anesthesia, 1993-1997
  - Committee on William O. McQuiston Award, 1992-1997
  - Midwest Anesthesia Conference, Scientific Exhibits Subcommittee, 1995-1998 Annual Meeting
  - Secretary, 1997-2000
  - Vice President, 2000-2001
  - President-Elect 2001-2002
  - President 2002-2003
  - Immediate past President 2003-2004
  - Committee on Governmental Affairs, 1997-2000
  - Committee on Communications 1997-2000
  - Executive Committee, 1997-2004
  - Medical Society Liaison Committee, 1998-2007
  - Illinois Medical Anesthesia Political Action Committee, Board of Governors, 2000-present;  
Vice Chair, 2004-2010,  
Chair 2010- 2016
  - Committee on Practice Management, 2000-2007
  - Distinguished Service Award Committee 2003-2005
  - Judicial and Professional Standards 2004-2007
  - Distinguished Service Award 2013

#### American Society of Anesthesiologists (ASA)

- Alternate Delegate, 1992-1994
- Delegate, 1995-2003
- Committee on Scientific Exhibits Annual Meeting, 1992-1994
- Subcommittee on Local Anesthesia and Pain Annual Meeting, 1993 – 2001
- Subcommittee on Chronic and Cancer Pain, 2003-2008
- Task Force on Chronic Pain Guidelines, 1996

- Consultant to ASA Positioning Task Force, 1999
- Task Force on Interventional Pain Medicine, 2001-2002
- Committee on Pain Medicine 2003-2011

#### Chicago Society of Anesthesiologists

- Secretary, 1994-1995
- Vice President, 1996-1997
- President, 1998-1999

#### Illinois Society of Interventional Pain Physicians (ISIPP)

- Secretary, 2005-2009
- President, 2009-2010

#### Illinois State Medical Society (ISMS)

- Workman's Compensation Task Force Committee, 2001-2005

#### American Pain Society and the American College of Physicians Task Force

- Low Back Pain Clinical Guidelines Panel 2005-2008

#### Neuromodulation Consensus Association for Spinal Cord Stimulation

- America Society of Anesthesiology Representative 2006

#### Spinal Cord Stimulation Consensus Guidelines Task Force 2006

#### Scientific Advisory Committee Reflex Sympathetic Dystrophy Association of America, 1988-present

#### International Research Foundation for RSD/CRPS

- Vice President 2006-2010

#### Rush Surgical Society 1987-present

- President 2007-2008

#### International Association for the Study of Pain (IASP). Special Interest Group: Pain and the Sympathetic Nervous System. 1991- present

#### Association of Anesthesia Pain Program Directors

- Board of Directors 2011- 2013

#### American Society of Pain and Neuroscience

- Founding Member 2018
- Board of Directors Emeritus 2018- present

#### Departmental Committees

- Chairman's Advisory Committee, Department of Anesthesiology, Rush University Medical Center, 1993-Present
- Patient Care Committee, Department of Anesthesiology Rush University Medical Center, 1987-2004
- Morbidity and Mortality Committee, Department of Anesthesiology, Rush University Medical Center, Co-chairman, 1987-1990
- Research Committee 1987-present

#### EDITORIAL BOARDS:

- Consulting Reviewer, The Clinical Journal of Pain, 1991-1996
- Editorial Board, The Pain Journal Club Journal, 1995-2000
- Consulting Reviewer, Neuromodulation, 2007- present
- Editorial Board, Pain Physician, 2008-2014
- Editorial Board, Regional Anesthesia and Pain Medicine 2015-present

#### HOSPITAL COMMITTEES:

- Committee on Committees – Secretary 1988-1989
- Surgical and Invasive Procedure Review Committee, 1993-2008
- Surgical Utilization Management Subcommittee, 1995-2008
- Pain Clinical Pathway Committee, 1995-1996
- PCA Clinical Pathway Committee, Chair, 1997-1999
- Global Pain Initiative Committee, Co-chair, 1999-2005
- Graduate Medical Education Committee, 1995-present
- Total Joint Arthroplasty Clinical Pathway Committee, 1998-2015
- Physician's Assistance Committee 2003 – 2006
- Rush Surgicenter Finance Committee 2003 - present

#### BOARD CERTIFICATION:

- American Board of Anesthesiology, Anesthesiology 1987
- American Board of Anesthesiology, Pain Management Certification 1994,2004,2014; Recertified through 2024
- Diplomate, Board Certified Fellow American Academy of Pain Medicine. 1995
- Board Certified Fellow, Interventional Pain Practice, World Institute of Pain. 2008

LICENSE: Illinois, 1984

- CURRENT RESEARCH:
1. A Randomized Controlled Study to Evaluate the Safety and Effectiveness of the Precision Spinal Cord Simulating System Adapted for High Rate Spinal Cord Stimulation
  2. Bisphosphonates for the treatment of CRPS
  3. Dorsal Root Ganglion stimulation for treatment of CRPS
  4. ACCELERATE Extension (Sub Study): A Study to Evaluate the Safety and effectiveness of Precision Spinal Cord Stimulator Systems Adapted for High-Rate Spinal Cord Stimulation
  5. A Randomized, Double-blind, Placebo-controlled Study to Assess the Efficacy and Safety of AXS-02 (Disodium Zoledronate Tetrahydrate) Administered Orally to Subjects with Complex Regional Pain Syndrome Type I (CRPS-I)
  6. A long Term Follow up of Participants Enrolled and Treated in the Prospective, Multi-Center, Randomized, Clinical Trial Evaluating the Safety and Effectiveness of Using Coolief in the Management of Knee Pain - A Sub Study

### **PUBLICATIONS – BOOK CHAPTERS**

1. Lubenow TR, Ivankovich AD: Patient-controlled analgesia: The anesthesiologist's viewpoint. In: Adjuncts to cancer surgery. Economou S, Witt TR, Deziel D, et al., eds. Lea & Febiger, Philadelphia p 616-621 1991.
2. Keh-Wong E, Lubenow TR: Treatment of cancer pain. In: Adjuncts to Cancer Surgery Economou S, Witt TR, Deziel D, et al., eds. Lea & Febiger, Philadelphia, p 605-610 1991
3. Lubenow TR, Ivankovich AD: Organization of an Acute Pain Management Service. Advances in Anesthesia. Stoelting, Barash & Gallagher, eds. Mosby Year Book Chicago 8:1-21 1991.
4. Lubenow TR: Epidural analgesia – considerations and delivery methods. In: Sinatra RS, Hord AH, Ginsberg B, Preble L. (eds) Acute Pain Mechanisms and Management. Mosby Year Book, Malvern PA p 233-242 1992.
5. Lubenow TR, McCarthy RJ, Ivankovich AD: Management of acute postoperative pain. In: Barash, Cullen, Stoelting, eds. Clinical Anesthesia 2<sup>nd</sup> ed. Philadelphia JB Lippincott p 1547-1578 1992.
6. Lubenow TR, Faber LP: Postthoracotomy Analgesia. Pairolero PC, Trastek VF, eds. Chest Surgery Clinics of North America. Philadelphia WB Saunders, 2(4):721-743 1992.

7. Lubenow TR, McCarthy RJ, Ivankovich AD: Management of Acute Postoperative Pain. *Clinical Anesthesia Updates*. Barash PG, Cullen BF, Stoelting RK, eds. Philadelphia Lippincott, 3(4):1-15 1992.
8. Lubenow TR, Analgesic Techniques, *Textbook of Regional Anesthesia*. Brown D, ed. Philadelphia WB Saunders, p 644-657 1996.
9. Blum S, Lubenow TR, Neurolytic Agents – What is New. *Current Review of Pain Vol 1*, Raj, P. Philadelphia WB Saunders (Current Medicine) p 70-78 1996.
10. Lubenow TR, McCarthy RJ, Ivankovich AD: Management of Acute Postoperative Pain. In: Barash, Cullen, Stoelting eds. *Clinical Anesthesia 3<sup>rd</sup> Ed*. Philadelphia JB Lippincott, p 1305-1338 1996.
11. Brown DV, Lubenow TR: Management of post-thoracotomy pain. Franco, Putnam eds. *Advanced therapy in thoracic surgery*. Hamilton, Ontario CANADA, p 13-23 1998.
12. Lubenow TR: Inadequate Pain Treatment Complications in Anesthesia. Atlee J, eds. Philadelphia WB Saunders, p 372-374 1999.
13. Lubenow TR, McCarthy RJ, Ivankovich AD: Management of Acute Postoperative Pain. In: Barash, Cullen, Stoelting eds. *Clinical Anesthesia 4<sup>th</sup> Ed*. Philadelphia JB Lippincott, p 1403-1434 2001.
14. Lubenow TR, McCarthy RJ, Ivankovich AD: Management of Acute Postoperative Pain. In: Barash, Cullen, Stoelting eds. *Handbook of Clinical Anesthesia 4<sup>th</sup> Ed*. Philadelphia JB Lippincott, p765-783 2001.
15. Lubenow TR, Buvanendran, AK, Stanton-Hicks M: Implanted therapies. In: Stanton-Hicks, Harden, Wilson (eds). *CRPS: Current diagnosis and Therapy*, p 217-234 2005.
16. Burton A, Raj P, Lubenow TR: Traditional interventional therapies. In: Stanton-Hicks, Harden, Wilson (eds). *CRPS: Current Diagnosis and Therapy*, p 235-254 2005.
17. Lubenow TR, Ivankovich AD, Barkin RL: Management of Acute Postoperative Pain. In: Barash, Cullen, Stoelting eds. *Clinical Anesthesia 5<sup>th</sup> Ed*. p 1405-1440 2006.
18. Lubenow TR, Ivankovich AD, Barkin RL. Management of Acute Postoperative Pain In: Barash Cullen & Stoelting. *Handbook of Clinical Anesthesia*, p 881-902 2006.
19. Kari,M, Jaycox,M, Lubenow TR.Complications of Intrathecal Drug Delivery. In: *Intrathecal Drug Delivery for Pain and Spasticity*, 1st Edition Deer, Diwan, Buvanendran, Elsevier p 102-110. 2012
20. Postoperative Pain and Its Management. Buvanendran AK, Lubenow TR, Kroin J  
In Koltzenburg & McMahon: *Wall & Melzack's Textbook of Pain*, 6th Edition 2013)
21. Jaycox, MJ, Young, AC, Lubenow, TR Spinal Cord Stimulation, Cervical: Trialing. In *Advanced Procedures for Pain Management: A Step by Step Atlas* ed. Pope, Kapural, Diwan, Staats. Springer Nature, (2018)

### **PUBLICATIONS – ORIGINAL MANUSCRIPTS**

1. Fischer R, Lubenow TR: Analgesia for labor and delivery. *Hospital Therapy* 1986;11 (12):38-53, 1986.



2. Lubenow T, Keh-Wong E, Kristof A, McCarthy RJ, Ivankovich AD: Inadvertent subdural injection: a complication of an epidural block. *Anesth Analg* 67:175-179, 1988.
3. Fischer RL, Lubenow TR, Liceaga A, McCarthy RJ, Ivankovich AD: Comparison of continuous epidural infusion of fentanyl-bupivacaine and morphine-bupivacaine in management of postoperative pain. *Anesth Analg* 67:559-563, 1988.
4. Spiess BD, Sloan MS, McCarthy RJ, Lubenow TR, Tuman KJ, Matz SD, Ivankovich AD: The incidence of venous air embolism during total hip arthroplasty. *J Clin Anesth* 1(1):25-30, 1988.
5. Litwack K, Lubenow TR: Practical points in the management of continuous epidural infusions. *J of Post Nurs* (5):327-330, 1989.
6. Lubenow TR, Ivankovich AD: Intraspinal narcotics for treatment of cancer pain. *Semin in Surg Oncol* 6:173-176, 1990.
7. McCarthy RJ, Kroin JS, Lubenow TR, Penn RD, Ivankovich AD: Effect of intrathecal tizanidine on antinociception and blood pressure in the rat. *Pain* 40(3):333-338, 1990.
8. Lubenow TR, Ivankovich AD: Patient controlled analgesia for postoperative pain. *Crit Care Nursing Clinics of North America* 3(1):25-34, 1991.
9. Lubenow TR, Ivankovich AD: Patient controlled analgesia for postoperative pain. *Crit Care Nursing Clinics of North America* 3(1):35-41, 1991.
10. Spiess BD, Tuman KT, McCarthy RJ, Logas WG, Lubenow TR, Williams J, Sankary H, Foster P. Oxygen consumption and mixed venous oxygen saturation monitoring during orthotopic liver transplantation. *J of Clinical Monitoring* 8:7-11, 1992.
11. Lubenow TR, McCarthy RJ: Evaluating comparisons between continuous epidural and intermittent bolus techniques for postoperative analgesia. *Regional Anesthesia* 17:110-111, 1992.
12. Lubenow TR, Tanck EN, Hopkins EM, McCarthy RJ, Ivankovich AD: Comparison of Patient-assisted Epidural Analgesia with Continuous Infusion Epidural Analgesia for Postoperative Patients. *Regional Anesthesia* 19(3):206-211, 1994.
13. Lubenow TR, Faber LP, McCarthy RJ, Hopkins EM, Warren W, Ivankovich AD: Post Thoracotomy Pain Management using Continuous Epidural Analgesia in 1,324. *Annals of Thoracic Surgery* 58:924-930, 1994.
14. Kroin JS, McCarthy RJ, Penn RD, Lubenow TR, Ivankovich AD: Intrathecal Clonidine and Tizanidine in Conscious Dogs: Comparison of Analgesia and Hemodynamic Effects. *Anesth Analg* 82:627-635, 1996.
15. Barkin RL, Lubenow TR, Bruehl S, Husfeldt B, Ivankovich OI: Management of Chronic Pain Disease-a-month, p 388-354, 1996.
16. Levine LA, Matkov TG, Lubenow TR: Microsurgical Denervation of the Spermatic Cord: A Surgical Alternative in the Treatment of Chronic Orchialgia. *The Journal of Urology* 12:316-325, 1996.
17. Bruehl S, Lubenow TR, Nath H, Ivankovich AD: Validation of Thermography in the Diagnosis of Reflex Sympathetic Dystrophy and Non-RSD Chronic Pain Patients. *Clinical Journal of Pain* 12:316-325, 1996.
18. Bruehl S, Husfeldt B, Lubenow TR, Nath H, Ivankovich AD: Psychological Differences Between Reflex Sympathetic Dystrophy and Non-RSD Chronic Pain Patients. *Pain* 67:107-114, 1996.
19. Shulman M. Lubenow TR, Nath HA, Blazek W, McCarthy RJ, Ivankovich AD: Nerve Blocks with 5% Butamben Suspension for the Treatment of Chronic Pain. *Regional Anesthesia & Pain Medicine* 23:395-401, 1998.

20. Shulman M, Harris JE, Lubenow TR, Nath HA, Ivankovich, AD. Comparison of Epidural Butamben to Celiac Plexus Neurolytic Block for the Treatment of the Pain of Pancreatic Cancer. *Clin J Pain* 16:304-309, 2000.
21. Stanton-Hicks MD, Burton AW, Bruehl SP, Carr DB, Harden RN, Hassenbusch SJ, Lubenow TR, Oakley JC, Racz GB, Raj PP, Rauck RL, Rezai AR. An Updated Interdisciplinary Clinical Pathway for CRPS: Report of an Expert Panel. *Pain Practice* 2(1):1-16, 2002.
22. Buvanendran A, Kroin JS, Tuman KT, Lubenow TR, Elmofty D, Moric M, Rosenberg AG. Effects of perioperative administration of a selective cyclooxygenase 2 inhibitor on pain management and recovery of function after total knee replacement. A randomized controlled trial. *JAMA* November p. 2411-2418, 2003.
23. Buvanendran A, Kroin JS, Tuman KJ, Lubenow TR, Elmofty D, Luk P. Cerebrospinal fluid and plasma pharmacokinetics of the cyclooxygenase 2 inhibitor rofecoxib in humans: single and multiple oral drug administration. *Anesth Analg* 100 (5):1320-1324, 2005.
24. Moric M, Buvanendran A, Mehta A, Kroin JS, Tuman KJ, Lubenow T. Chronic pain patient's response to the Sept 11<sup>th</sup> terrorist attacks: Depression and rate of pain clinic visits. *Pain Medicine* 2006;7.
25. Moric M, Buvanendran A, Lubenow T, Mehta A, Kroin J, Tuman KJ. Response of chronic pain patients to terrorism: The role of underlying depression. *Pain Medicine* 8:425-432, 2007.
26. North R, Shipley J, Prager J, Lubenow T, et al. Practice parameters for the use of the spinal cords stimulation in the treatment of chronic neuropathic pain. *Pain Med* 2007;8 Suppl(4):S200-75.
27. Buvanendran A, Lubenow T. Efficacy of Transverse Tripolar Spinal Cord Stimulator for the Relief of Chronic Low Back Pain from Failed Back Surgery. *Pain Physician* 2008 May-Jun;11(3):333-8.
28. Norman Harden, R; Bruehl, B; Perez, R; Birklein, F; Marinus, J; Maihofner, C; Lubenow, TR; Buvanendran, AK; Mackey, S; Graciosa, J; Ramsden, C; Chont, M; and Vatine J. Validation of proposed diagnostic criteria (the "Budapest Criteria") for Complex Regional Pain Syndrome. *Pain Volume* 150, Issue 2, August 2010, Pages 268-274
29. Norman Harden, R; Bruehl, B; Perez, R; Birklein, F; Marinus, J; Maihofner, C; Lubenow, TR; Buvanendran, AK; Mackey, S; Graciosa, J; Ramsden, C; Chont, M; and Vatine, J. Development of a severity score for CRPS. *Pain Vol . Pain*. 2010 Dec;151(3):870-6
30. Kirkpatrick, A; Lubenow TR, Regarding Bell and Moore, Intravenous ketamine for CRPS: Making too much of too little? *Pain* 2010. 150:10–11. Letter to the Editor. *Pain*. 2010. 151 p. 556
31. Liu, S; Buvanendran, AB; Viscusi, E; Hutton, E; Lubenow, TR; Zhou, J; Shaw, P; Moric, M; Lenart, S. Uncomplicated removal of epidural catheters in 4,365 patients with international normalized ratio greater than 1.4 during initiation of warfarin therapy. *Reg Anesth Pain Med*. 2011 May-Jun;36(3):231-5

32. Van Eijs, F, Stanton-Hicks, M; Van Zundert, J; Faber,C; Lubenow, TR; Mekhail,N; van gen, F. . Evidence-based interventional pain medicine according to clinical diagnoses. 16. Complex regional pain syndrome. Pain Pract. 2011 Jan-Feb;11(1):70-87
33. Oaklander AL, Wilson PR, Moskovitz PA, Manning DC, Lubenow TR, Levine JD, Harden RN, Galer BS, Cooper MS, Bruehl S, Broatch J, Berde C, Bennett GJ. Response to "A new definition of neuropathic pain". Pain. 2012 Apr;153(4):934-5.
34. Lubenow, TR. Jaycox, M."Current trends in the diagnosis and treatment of Complex Regional Pain Syndrome" In ASA Refresher courses in Anesthesiology. 40(1): 95-104, 2012
35. Young A, Lubenow TR, Buvanendran AK. The Parturient with Implanted Spinal Cord Stimulator: Management and Review of the Literature. Regional Anesthesia and Pain Medicine. 40:276-283, 2015
36. Buvanendran A<sup>1</sup>, Lubenow TR. Vigilance to Medical Device Failures. Regional Anesth and Pain Medicine. 2016 Mar-Apr;41(2):125-6.
37. Hunter, C, Sayed, D, Lubenow, TR; et al DRG FOCUS – A Multicenter Study Evaluating Dorsal Root Ganglion Stimulation and Predictors for Trial Success. Neuromodulation: ( In Press) Neuromodulation. 2018 Aug 7. doi: 10.1111/ner.12796. [Epub ahead of print]
38. Deer, T, Pope, J, Lamer, T, Grider, J, Provenzano, D,,Lubenow, TR, et al. The Neuromodulation Appropriateness Consensus Committee (NACC) on Best Practices for Dorsal Root Ganglion Stimulation, Neuromodulation ( IN Press) DOI:10.1111/ner.12845
39. Cohen SP, Bhatia A, Buvanendran A, Schwenk ES, Wasan AD, Hurley RW, Viscusi ER, Narouze S, Davis FN, Ritchie EC, Lubenow TR, Hooten WM. Consensus Guidelines on the Use of Intravenous Ketamine Infusions for Chronic Pain from the American Society of Regional Anesthesia & Pain Medicine (ASRA) and the American Academy of Pain Medicine (AAPM). Reg Anesth Pain Med Vol 43 No 5. P 521-546 2018; doi: 10.1097/AAP.0000000000000808
40. The MIST Guidelines: The Lumbar Spinal Stenosis Consensus Group Guidelines for Minimally Invasive Spine Treatment Pain Practice (In Press) DOI:10.1111/papr.12744

### ABSTRACTS

1. Spiess BD, Sloan M, Matz SD, Lubenow TR, Ivankovich AD: The incidence of venous air embolism during total hip arthroplasty. Anesth Analg S150, 1986.

2. Lubenow TR, Spiess BD, Sloan MS, Matz SD, Ivankovich AD: Incidence of venous air embolism in total arthroplasty. Midwest Anesthesia Residents Conference, Rochester, MN March 21-2B 1986
3. Fischer R, Lubenow TR, Liceaga A, McCarthy RJ, Ivankovich AD: A comparison of continuous epidural narcotic local anesthetic mixtures for postoperative analgesia. *Anesth Analg* 66:S56, 1987.
4. Keh-Wong E, Lubenow TR, Froehlich J, Kristof K, Ivankovich O, Ivankovich AD: Subdural block following epidural injection of low doses of bupivacaine. *Anesth Analg* 66:S95, 1987.
5. Lubenow TR, Braverman B, Ivankovich AD: Management of a postoperative epidural analgesia service. *Reg Anesth* 13(1S):92, 1988.
6. Lubenow TR, Fischer RL, Besser TP, McCarthy RJ, Newman LM, Ivankovich AD: Comparison of continuous epidural infusions of sufentanil-bupivacaine with morphine-bupivacaine. *Anesthesiology* 69(3A):397, 1988.
7. Lubenow TR, Ivankovich AD: Serum alcohol CPK and amylase levels following celiac plexus block with alcohol. *Anesthesiology* 69(3A):381, 1988.
8. Lubenow TR, Ivankovich AD: Serum alcohol CPK and amylase levels following celiac plexus block with alcohol. *Reg Anesth* 13(1S):64, 1988.
9. Lubenow TR, Keh-Wong E, Kristof k, Ivankovich O, Ivankovich AD: Inadvertent subdural injection: A complication of an epidural block. *Reg Anesth* 13(1S):54, 1988.
10. Lubenow TR, Kroin J, McCarthy RJ, Ivankovich AD: Analgesic evaluation of intrathecal somatostatin-14 and SMS 201-995 in the rat. *Reg Anesth* 13(1S):63, 1988.
11. Lubenow TR, Logas WG, Wong J, Ivankovich AD: Postoperative epidural analgesia with continuous narcotic-local anesthetic infusions. *Reg Anesth* 13(1S):77, 1988.
12. Lubenow TR, Wong J, McCarthy RJ, Logas WG, Ivankovich AD: Prospective evaluation of continuous epidural narcotic-bupivacaine infusions in 1000 postoperative patients. *Anesthesiology* 69(3A):389, 1988.
13. Hunter JA, Lubenow TR, McCarthy RJ, Ivankovich AD: Analgesic evaluation of intrathecal clonidine and tizanidine. Presented at Midwest Anesthesia Residents Conference, Chicago, 1989.
14. Lubenow TR, Dragisic B, Kamper B, McCarthy RJ, Ivankovich AD: Efficacy of epidural steroid injection for low back pain. *Reg Anesth* 14(2S):28, 1989.
15. Lubenow TR, Kroin J, McCarthy RJ, Ivankovich AD: Analgesic and hemodynamic evaluation of intrathecal clonidine and tizanidine. *Anesthesiology* 71(3A):A648, 1989.
16. Lubenow TR, Kroin J, McCarthy RJ, Lyon S, Penn R, Ivankovich AD: Analgesic evaluation of intrathecal clonidine and tizanidine. *Reg Anesth* 14(2S):31, 1989.
17. Lubenow TR, Wong J, McCarthy RJ, Ivankovich AD: Prospective evaluation of continuous epidural narcotic-bupivacaine infusion in 1500 prospective patients. *Reg Anesth* 14(2S):32, 1989.
18. Lubenow TR, Ivankovich AD: Review of intravenous guanethidine sympatholysis. *Reg Anesth* 15(1S):12, 1990.
19. Lubenow TR, McCarthy RJ, Grande S, Ivankovich AD: Comparison of continuous epidural narcotic mixtures to patient-controlled analgesia after major orthopedic surgery. *Anesth Analg* 70:S250, 1990.
20. Martin N, McCarthy RJ, Lubenow TR, Ivankovich AD: Mechanism of action and tolerance to the analgesic effects of intrathecal tizanidine. Presented to the Midwest Anesthesia Residents Conference, Kansas City, Kansas, March 1990.

21. Lubenow TR, McCarthy RJ, Penn, Ivankovich AD. Cross tolerance and synergy between intrathecal tizanidine and morphine. *Anesth Vol. 73 A1261*, Sept. 1990.
22. Lubenow TR, Durrani Z, Ivankovich AD. Evaluation of continuous epidural fentanyl/butorphanol infusion for postoperative pain. *Anesth Vol. 73 A800*, Sept. 1990.
23. Lubenow TR, Narbone R, Deutsch T, Ivankovich AD. A survey of anesthesia practice and training in retrobulbar nerve blocks. *Reg Anesth Vol. 15 No. 1S*, Jan-Feb. p 60, 1991.
24. Newman LM, Dragisic PB, Lubenow TR, McCarthy RJ, Ivankovich AD: Nalbuphine ameliorates the pruritus caused by continuous epidural bupivacaine fentanyl in postoperative patients. *Anesthesiology Vol. 75 A770*, Sept. 1991.
25. Lubenow TR, Deutsch T, Narbone FR, Ivankovich AD: Current Anesthesia practice and training in retrobulbar nerve blocks. *Anesthesiology Vol. 75 A885*, Sept. 1991.
26. Lubenow TR, McCarthy RJ, Tuman KJ, Ivankovich AD: Effects of phenylephrine on right ventricular performance in patients with right coronary artery disease. 4<sup>th</sup> International Symposium of Anesthesia for Cardiac Patients, p 91, 1992.
27. Lubenow TR, McCarthy RJ, Kroin JS, Ivankovich AD: Hemodynamic and Analgesic Effects of a 48 hr. continuous intrathecal Tizanidine infusion in Dogs, *Regional Anesthesia Vol. 17, No. 1S*, p 87, 1992.
28. Shulman M, Ivankovich AD, Braverman B, Lubenow TR: Treatment of Chronic Intractable Back Pain with Injection of a 10% Butamben Suspension. *Regional Anesthesia Vol. 7, No. 1S*, p 87, 1992.
29. Lubenow TR, Tanck EN, Hopkins EM, Ivankovich AD: Comparison of Patient-Assisted Epidural Analgesia with Continuous Infusion Epidural Analgesia for Postoperative Patients. *Anesthesiology Vol 77, A827*, 1992.
30. Lubenow TR, Shulman M, Lipov E, Buck M, Ivankovich AD: An Alternative Approach to Epidural Steroid Injections in Patients after Spine Surgery. *Anesthesiology. Vol 179, A890*, 1993.
31. Shulman M, Braverman B, Lubenow TR, Ivankovich AD: Treatment of Chronic Pain Syndrome by Peripheral Nerve Blocks with 2.5% Butamben Suspension. *Anesthesiology. Vol 79, A893*, 1993.
32. Lubenow TR, Faber LP, Warren w, McCarthy RJ, Hopkins E, Ivankovich AD: Postthoracotomy Pain Management Using Continuous Epidural Analgesia in 1,324 Patients. Society of Thoracic Surgeons Thirtieth Annual Meeting. February 1994.
33. Shulman M, Braverman B, Ivankovich AD, Lubenow TR, Blazek W: Treatment of Chronic Pain Syndromes with 5.0% Butamben Suspension. *Regional Anesthesia 19(2S):43*, 1994.
34. Lubenow TR, McCarthy RJ, Nelson WE, Chrubasik J, Ivankovich AD: Dural Permeability and Hemodynamic Effect of Epidural Morphine and Tizanidine in Dogs. *Anesthesiology 81:A984*, 1994.
35. Lubenow TR, McCarthy RJ, Kroin JR, Bednar L, Ivankovich AD: Comparative Analgesic and Hemodynamic Effects of Intrathecal Morphine, Tizanidine, and Clonidine in Dogs. *Anesthesiology 81:A936*, 1994.
36. Lubenow TR, Shulman M, Rozanski L, Ivankovich AD: Comparison of Coeliac Plexus Neurolytic Block and Epidural Butamben Injection for the Control of Pain from Metastatic Cancer. *Regional Anesthesia 20(2S):53*, 1995.
37. LubenowTR, McCarthy RJ, Kroin J, Ivankovich AD: Analgesic Potency of Intrathecal Tramadone and Morphine. *Regional Anesthesia 20 (2S):53*, 1995.

38. Shulman M, Greenlee W, Kim T, Lubenow TR, Ivankovich AD: Magnetic Resonance Imagery of Epidural Butamben Injections. *Regional Anesthesia* 20(2S):134, 1995.
39. Lubenow TR, McCarthy J, Kroin JS, Ivankovich AD: Analgesic, Hemodynamic and Respiratory Responses to Intrathecal Tramadol. *Anesthesiology* 83(3A):A822, 1995.
40. Shulman M, Greenlee W, Kim T, Lubenow TR, Ivankovich AD: Magnetic Resonance Imaging of Epidural Butamben Injections. *Anesthesiology* 83(3A):A836, 1995.
41. Shulman M, Lubenow TR, Rozanski-Dragsic LR, Ivankovich AD: Comparison of Coeliac Plexus Neurolytic Block and Epidural Butamben Injection for the Control of Pain from Metastatic Cancer of the Pancreas. *Anesthesiology* 83(3A):A807, 1995.
42. Lubenow TR, McCarthy RJ, Kroin JS, Ivankovich AD: Effect of Combined NMDA and CCK Antagonists on the Development of Morphine Tolerance in Rats. *Anesthesiology* 85(3A):A789, 1996.
43. Lubenow TR, Dragsic BM, Breuhl S, Ivankovich AD: Bretylium, Lidocaine, Phentolamine and Hydrocortisone in Combination for IV Regional Sympathetic Blocks in the Treatment of Reflex Sympathetic Dystrophy. American Academy of Pain Management Annual Meeting. A121, 1996.
44. Lubenow TR, Avramov MN, Becker H, Husfeldt B, Ivankovich AD: Use of epidural clonidine/bupivacaine infusion for the treatment of Complex Regional Pain Syndrome. *Anesthesiology* 89(3A):A1110, 1998
45. Husfeldt B, Greenberg J, Avramov MN, Lubenow TR, Ivankovich AD: Psychological distress and coping strategies in men and women with Complex Regional Pain Syndrome or low back pain. *Anesthesiology* 89(3A):A1111, 1998.
46. Lubenow TR, McCarthy RJ, Leetz T, Chan G, Ivankovich AD: Factors affecting patient satisfaction with postoperative patient assisted epidural analgesia. *Anesth Analg* 88:S278, 1999.
47. Lubenow TR, Dragsic BM, Avramov M, Ivankovich AD: Clinical evaluation of a new laryngoscope blade. *Anesthesiology* 91(3A):A481, 1999.
48. Husfeldt B, Greenberg J, Lubenow TR: Psychosocial functioning after spinal cord stimulation in CRPS patients. American Pain Society, A922, 1999.
49. Buvanendran A, Leetz JT, Lubenow TR, Ivankovich AD: Addition of Epidural Clonidine to Fentanyl/Bupivacaine Improves Postoperative Analgesia in Patients with Chronic Preoperative Opioid Consumption. *Anesthesiology* 93(1):A847, 2000.
50. Lubenow TR, Buvanendran A, Leetz TJ, Ivankovich AD: Comparison of Side Effects in Patients Receiving Combined Spinal Epidural versus Epidural Analgesia after Accidental Dura-Arachnoid Puncture. *Anesthesiology* 93(1):A858, 2000.
51. Buvanendran A, Lubenow T, Leetz T, Petrovich A, Ivankovich A: Evaluating the outcome of an algorithm guided treatment approach to complex regional pain syndrome (CRPS). *Anesthesiology* A814, 2001.
52. Buvanendran A, Linton J, Lubenow TR, Ivankovich AD: Efficacy of 5-day continuous unilateral epidural infusion of bupivacaine and clonidine for the treatment of complex regional pain syndrome. *Anesth Analg* 92:S251, 2001.
53. Buvanendran A, Linton J, Lubenow TR, Ivankovich AD: The utility of combining corticosteroids with local anesthetic for diagnostic facet injections for staging prior to radiofrequency rhizotomy of the zygapophyseal joint. *Anesth Analg* 92:S252, 2001.
54. Kroin JS, McCarthy RJ, Lubenow TR, Ivankovich AD. Continuous intrathecal clonidine and tizanidine in conscious dogs: Comparison of analgesic and hemodynamic effects. *Anesthesiology* 95:A953, 2002.

55. Lubenow TR, Masor M, Buvanendran A, Sanders S, Tuman KJ. Utility of continuous intrathecal infusion of bupivacaine and fentanyl for postoperative pain following orthopedic joint replacement after accidental dural puncture. *Anesthesiology* 95:A888, 2002.
56. Buvanendran A, Elmofty D, Lubenow TJ, Kroin SK, Tuman KJ: Perioperative administration of selective cyclooxygenase-2 (COX-2) inhibitor reduces postoperative epidural drug consumption after total knee arthroplasty. (TKA). *Anesthesiology* A943, 2002.
57. Mohajer P, Buvanendran A, Lubenow TJ, Biyani A, Ivankovich AD: Is the long-term efficacy of epidural steroid injections for cervical spinal stenosis different than for herniated nucleus pulposus? *Anesthesiology* A920, 2002.
58. Buvanendran A, Masor M, Sanders S, Lubenow TL, Ivankovich A: The impact of early transition from postoperative epidural analgesia to controlled release oxycodone on pain scores, side effects and patient satisfaction after total knee arthroplasty. *Anesth Analg* S223, 2003.
59. Buvanendran A, Mehta A, Moric M, Tuman KJ, Lubenow TR: The effect of terrorism on chronic pain and depression. Abstract. IARS Clinical and Scientific Congress. 2003.
60. Mohajer P, Biyani A, Kroin JS, Tuman KJ, Lubenow TR: Efficacy of Cervical Epidural Steroid Injections in Patients with Axial and Radicular Pain. Abstract. IARS Clinical and Scientific Congress. 2003.
61. Rokicki LA, Moric M, Buvanendran A, Ivankovich AD, Lubenow TR. Factor structure of the brief symptom inventory (BSI) using a large sample of chronic pain patients. *Anesth Analg*, S120, 2004.
62. Lubenow TR, Ramsey R, Moric M, Saha C, Buvanendran A. Safety of Magnetic Resonance Imaging (MRI) in patients with implanted neurostimulators. *Anesthesiology* A-1362, 2004.
63. Lubenow TR, Saha C, Moric M, Kroin JS, Buvanendran A: Continuous Epidural Sympathetic Infusions for the Treatment of Complex Regional Pain Syndrome (CRPS): Efficacy and Complications. *Anesthesiology* A979, 2004.
64. Buvanendran A, Moric M, Kroin JS, Lubenow TR, Tuman KT: Increasing Pattern of Oxycodone Misuse: Findings from a National Database. *Anesthesiology* A1136, 2004.
65. Saha C, Buvanendran AK, Moric M, Kroin JS, Lubenow TR. Opioid tolerance and Adjuvant Drugs in Intrathecal Drug Delivery Systems in Non-Cancer Patients. *Anesthesiology* A328, 2006.
66. Moric, M. Buvanendran AK, Lubenow TR, Froin JS, Tuman KJ. Abuse Potential of Prescription Pain Medication in the United States. *Anesthesiology* A1682, 2006.
67. Buvanendran A, Moric M, Kroin JS, Lubenow TR, Tuman KJ. Do chronic oral opioids impair driving skills? A randomized controlled trial. *Anesthesiology* A278, 2007.
68. Moric M, Buvanendran A, Lubenow TR. Increases in methadone drug related emergency room visits and poisoning deaths. *Anesthesiology* A284, 2007.
69. Buvanendran A, Lubenow T, Michael Majewski, et al. The INR Values at Removal of Epidural Catheter in 4013 Patients Receiving Warfarin. *Anesthesiology* A427, 2008.
70. Skorke, C, Majewski, M, Lubenow, TR, Buvanendran, A. Can The Epidural Catheter Be Removed With Warfarin?. Midwest Anesthesia Resident Conference, Indianapolis, IN, April 3-5, 2008.

71. Nelson, E, Wahood, Ar, Lubenow, TR, Holterman, M, Wahood, M. One Lung Ventilation With Thoracic Epidural Anesthesia For High Risk Thoracic Surgery. Midwest Anesthesia Resident Conference, Indianapolis, IN, April 3-5, 2008.
72. Ryan, K, Lubenow, T. Case Report- PN associated with Occupational Exposure to Automotive Spray Paint. Midwest Anesthesia Resident Conference, Chicago, IL, April 17-19, 2009.
73. Lubenow, T, et al. Safety and Efficacy of Long Term Tunneled Epidural Catheter Infusion in the Management of Pain and Arthrofibrosis following Knee Surgery. American Society of International Pain Physicians Annual Meeting (Washington D.C.), June 2009
74. Bennett D, Webster L, Lubenow T, et al. Occipital Nerve Stimulation: Surgical Technique and Outcomes from the PRISM Study of ONS for Drug-Refractory Migraine. North American Neuromodulation Society Annual Meeting, Las Vegas, Dec. 2009.
75. Buvanendran A, Lubenow TR, Moric M, Kerchberger JM, et al. The INR values at removal of epidural catheter in 6078 patients receiving warfarin. Proceedings of the 2009 Annual Meeting of the American Society Anesthesiologists, A164, October 2009.
76. Cantu, F; Lubenow, TR, Hoffman, R., Dedovic, S., Kirkpatrick A., Ketamine Coma Study: Objective Assessment of Outcome for Complex Regional Pain Syndrome. Anesthesiology A161. October 2010
77. Young, A, Lubenow, TR. Spinal Cord Stimulation: Safe in Pregnancy? The Results of a 4 Patient Series. American Society of Anesthesiologists 2011 Annual Meeting, Chicago, IL, Oct. 15-19, 2011.
78. Thillainathan V, DeLeon A, Lubenow TR. Epidural blood patch in a patient with Tarlov cysts. 11th Annual Pain Medicine Meeting, American Society of Regional Anesthesia. Miami, Fl. November 15-18, 2012
79. Pathak S, Lubenow TR. CT guided splanchnic nerve radiofrequency ablation for chronic abdominal pain. Midwest Anesthesia Residents Conference 2012, Chicago, IL, March 15-17, 2012.
80. Pathak S, Lubenow TR. CT guided splanchnic nerve radiofrequency ablation for chronic abdominal pain. 11th Annual Pain Medicine Meeting, American Society of Regional Anesthesia. Miami, Fl. November 15-18, 2012
81. Young A, Lubenow TR. Spinal cord stimulation: Safe in pregnancy? Midwest Anesthesia Residents Conference 2012, Chicago, IL, March 15-17, 2012.
82. Kim, David, Lubenow TR: DRG for Complex Regional Pain Syndrome. Presented to the Midwest Anesthesia Residents Conference, Chicago, IL. April 2017.
83. Traylor, Phillip, Lubenow TR: DRG for Complex Regional Pain Syndrome. Presented to the Midwest Anesthesia Residents Conference, Chicago, IL. April 2017.



84. Tripathi, Kush, Lubenow TR: Dorsal Root Ganglion Stimulation for Chronic Pain: A Prospective Review. Presented to the Midwest Anesthesia Residents Conference, Chicago, IL. April 2017.
85. Gumbrecht, D., Young, A., Lubenow TR: Treatment of Post-Knee Replacement Pain with Dorsal Root Ganglia Stimulation. Presented to the Anesthesiology and Acute Pain Medicine Meeting, San Francisco, CA. April 2017.
86. Lubenow, TR; Landphair, W. Dorsal Root Ganglion Stimulation for Chronic Pain: A Prospective Review. International Neuromodulation Society 13<sup>th</sup> World Congress Edinburgh, Scotland. May 2017.
87. Lubenow, TR; Landphair, W. Pain Scores and Medication Reduction in Subjects Undergoing Dorsal Root Ganglion Stimulation. ASA Annual Meeting, Boston, MA. October 2017.
88. Ramesh, A; Lubenow, TR. Dorsal Root Ganglion for Chronic Regional Pain Syndrome. ASA Annual Meeting, Boston, MA. October 2017
89. Shaaban M; Lubenow, TR. Myocardial Ischemia as a Complication of Intrathecal Drug Delivery System Malfunction. ASRA 16<sup>th</sup> Annual Pain Medicine Meeting. Orlando November., 2017
90. Dhanani, Dili; Lubenow, TR. DRG Stimulation for Lower Extremity Pain ASRA 16<sup>th</sup> Annual Pain Medicine Meeting. Orlando November, 2017

### **SCIENTIFIC EXHIBITS**

1. Lubenow TR, Ivankovich AD: Postoperative analgesia service. ASA Annual Meeting, Atlanta Georgia, October 1987.
2. Lubenow TR, Ivankovich AD: Management of a postoperative epidural analgesia service. IARS Annual Meeting, San Diego, CA, March 1988.
3. Lubenow TR, Ivankovich AD: Management of a postoperative epidural analgesia service. ASRA Annual Meeting, April 1988.

### **MULTIMEDIA PRESENTATIONS**

1. Lubenow TR, Williams Bryan: Complex Regional Pain Syndromes. ASRA: Neuropathic Pain, 2010. <https://asra.com/pain-resource-center-chronic-pain-complex-regional-pain-syndrome.php>
2. Jaycox, M, Lubenow, TR : Complex Regional Pain Syndrome. ASRA Neuropathic Pain website 2015 <https://www.asra.com/pain-resource/article/6/complex-regional-pain-syndrome#r6>

3. Young A, Jaycox, M, Lubenow TR . Perioperative Management of Intrathecal Drug Therapy, ASRA Neuromodulation Special Interest Group guidelines website 2015. <https://www.asra.com/page/199/resources>

### **PRESENTATIONS AND LECTURES**

1. Experimental Evaluation of Electrohemodynamics  
Midwest Anesthesia Residents' Conference, March 1985.
2. Incidence of Venous Air Embolism in Total Hip Arthroplasty  
Midwest Anesthesia Residents' Conference, March 1986.
3. Subdural Block Following Epidural Injection of low-dose Bupivacaine  
International Anesthesia Research Society Conference, March 1987.
4. Inadvertent Subdural Injection – A Definite Complication of an Epidural Block  
Midwest Anesthesia Residents' Conference, March 1987.
5. Analgesic Evaluation of Intrathecal Somatostatin – 14 and SMS 201-995 in the Rat  
Midwest Anesthesia Residents' Conference, March 1987.
6. Perioperative Pain Management – Regional Nerve Blocks  
Midwest Anesthesia Conference – Post Anesthesia Care Unit Conference, May 1987 and May 1988.
7. Epidural Narcotics for Post Surgical Pain Relief, Midwest Clinical Conference, Chicago, March 1998.
- 8-15. Management of Postoperative Pain Relief  
Kenosha Memorial Hospital, Kenosha, Wisconsin, August 1989  
Lutheran General Hospital, Park Ridge, Illinois August 1989  
Lincoln General Hospital, Lincoln, Nebraska, October 1989  
Franciscan Medical Center, Rock Island, Illinois February 1990  
Humana Hospital, Hoffman Estates, Illinois February 1990  
Victory Memorial Hospital, Waukegan, Illinois February 1990  
The Radisson Hotel, Southfield, Michigan, May, 1990  
South Suburban Hospital, Hazel Crest, Illinois, July 1991
16. Analgesic and Hemodynamic Evaluation of Intrathecal Clonidine, and Tizanidine, 7<sup>th</sup>  
Annual Clinical Update of Anesthesiology, Puerto Vallarta, Mexico. January 1989.
17. Epidural Narcotics for Postsurgical Pain Relief  
Illinois Society of Anesthesiology 3<sup>rd</sup> Annual Winter Meeting, Scottsdale, Arizona. February 1989.
18. Current Principles in Management of Postoperative Pain and Cancer Pain, General Surgery Grand Rounds, Rush University Medical Center, Chicago, Illinois. September 1989.
19. Management of Reflex Sympathetic Dystrophy  
Refresher Course for the Clinical Nurse, Rehab, Specialist, September 1989.
20. Continuous Epidural Infusion vs. Intermittent Bolus for Epidural Analgesia  
Yale University Acute Pain Service Workshop, New Orleans, October 1989.
21. Management of Acute and Chronic Pain  
Scholl School of Podiatry Annual Refresher Course, Chicago, January 1990.
22. Algorithm of Nerve Blocks for Chronic Back Pain  
7<sup>th</sup> Annual Clinical Update in Anesthesiology, Puerto Vallarta, Mexico, January 1989.

23. Acute Pain Service-Organization and Methods  
New York Postgraduate Assembly in Anesthesiology, New York, December 1990.
24. Intraspinal Alpha 2 Agonists for Postoperative Pain Relief: Current Status  
9<sup>th</sup> Annual Clinical Update in Anesthesiology, Barbados, January 1991.
25. Organization and Methodology of an Acute Pain Management Service  
Grand Rounds, Department of Anesthesiology, University of Michigan, Ann Arbor, Michigan, February 1991.
26. Management of Pain  
Grand Rounds, Department of Plastic Surgery and Orthopedic Surgery. Rush University Medical Center, Chicago, Illinois 1991.
27. Organization and Methodology of an Acute Pain Management Service  
University of Iowa, Department of Anesthesiology, Iowa City, June 1991.
28. New Trends in Postoperative Pain Management  
University of Iowa, Department of Anesthesiology, Iowa City, June 1991.
- 29-32. Modern Management of Postoperative Pain – Epidural Analgesia  
Tarzana Regional Medical Center, Staff Meeting, Northridge, California, August 1991  
Northridge Hospital Medical Center, Medical Staff Meeting, Northridge, California, August 1991  
St. Joseph's Hospital, Department of Anesthesiology Joliet, Illinois, March 1992  
Lake Forest Hospital, Lake Forest, Illinois, May 1992
33. Reflex Sympathetic Dystrophy  
Department of Neurology, Rush University Medical Center, Resident Conference, September 1991.
34. Reflex Sympathetic Dystrophy  
Department of Pediatrics Grand Rounds, Rush University Medical Center, May 1993.
35. Acute Pain Relief – Where Are We Now?  
1<sup>st</sup> Annual Post-Operative Pain Management, Symposium & Workshops, University of Michigan Medical School, Ann Arbor, Michigan September 1991.
36. What's New in PCA  
1<sup>st</sup> Annual Post-Operative Pain Management, Symposium & Workshops, University of Michigan Medical School, Ann Arbor, Michigan, September 1991.
37. Intrapleural Analgesia  
1<sup>st</sup> Annual Post-Operative Pain Management, Symposium & Workshops, University of Michigan Medical School, Ann Arbor, Michigan, September 1991.
38. Epidural steroids for Back Pain 1992 Midwest Clinical Conference, Chicago, Illinois February 1992.
39. Organization of an Acute Pain Clinic, 16<sup>th</sup> Scientific Meeting of the Midwest Pain Society, Chicago, IL, May 1992.
40. Acute Postoperative Pain Management and Safety  
Henry Ford Hospital, Detroit MI May 1992.
- 41-42. Recent Developments in the Management of Reflex Sympathetic Dystrophy  
Department of Anesthesiology Grand Rounds, Henry Ford Hospital, Detroit, Michigan May 1992.  
Department of Rehabilitation Medicine and Physical Therapy. Marianjoy Rehabilitation Hospital and Clinics, Chicago, Illinois, June 1992.
43. Intraoperative Aspects of Epidural Anesthesia

- Illinois Society of Anesthesiologists Annual Fall Meeting, Chicago, Illinois, November 1992.
44. Postoperative Pain Therapy for the Thoracic Surgical Patient  
11<sup>th</sup> Annual Clinical Update in Anesthesiology, Cancun, Mexico, January 1993.
  45. Effective Pain Management  
Illinois Society of Anesthesiologists, Midwest Anesthesia Conference, Chicago, IL May 1993.
  46. Reflex Sympathetic Dystrophy Syndrome  
Illinois Workman's Compensation Lawyers Association Annual Medical Seminar, Chicago, Illinois, October 1993.
  47. Nerve Blocks in the Management of Cancer Pain  
Illinois Society of Anesthesiologists, Annual Fall Meeting, Chicago, Illinois November 1993.
  48. Sympathetically Mediated Pain and Treatment  
Department of Obstetric and Gynecology, Section of Urogynecology  
Rush University Medical Center, December 1993.
  49. New Spinal and Epidural Agents: Alpha-2 Agonists  
12<sup>th</sup> Annual Symposium Clinical Update in Anesthesiology, St. Thomas, U.S.V.I.  
January 1994.
  50. Invasive Therapy for Management of Cancer Pain  
Medical Staff Grand Rounds, Hinsdale Hospital, January 1994.
  51. Eye Blocks Workshop  
American Society of Regional Anesthesia 19<sup>th</sup> Annual Meeting, Chicago, April 1994.
  52. Brachial Plexus Anesthesia Workshop  
Midwest Anesthesia Conference, Chicago, May 1994.
  53. Epidural Anesthesia for the Management of Postoperative Pain  
Department of Obstetrics and Gynecology Grand Rounds  
Rush University Medical Center, Chicago, June 1994.
  54. Management of Low Back Pain  
Department of Family Practice Continuing Medical Education Course, Chicago Medical School, North Chicago, June 1994.
  55. Neurostimulation  
American Society of Regional Anesthesia Comprehensive Review of Pain Management, Chicago, August 1994.
  56. Low Back Pain and Facet Arthropathy  
American Society of Regional Anesthesia Comprehensive Review of Pain Management, Chicago, August 1994.
  57. Clinical Forum on Pain Management  
American Society of Anesthesiologists Annual Meeting, San Francisco, October 1994.
  58. Preemptive Epidural Analgesia in the Management of Postoperative Pain  
Department of Obstetrics and Gynecology, Cook County Hospital, Chicago, November 1994.
  59. Multidisciplinary Approach to the Treatment of Low Back Pain Clinical Panel on Pain Management, American Society of Anesthesiologists Annual Meeting, Atlanta, October 1995.
  60. Management of Post-thoracotomy Pain  
14<sup>th</sup> Annual Symposium, Clinical Update in Anesthesiology, Aruba, North America, January 1996.

- 61-62. Management of Reflex Sympathetic Dystrophy (RSD & CRPS)  
 Medical Grand Rounds, Glens Falls Medical Center, Glens Falls, New York, June 1996.  
 Department of Rheumatology, Rush University Medical Center, Chicago, November 1997.
63. Sympathetic and Somatic Nerve Blocks  
 American Society of Regional Anesthesia 3<sup>rd</sup> Annual Comprehensive Review of Pain Management, Chicago, Illinois, August 1996.
64. Neurostimulation.  
 American Society of Regional Anesthesia 3<sup>rd</sup> Annual Comprehensive Review of Pain Management, Chicago, Illinois, August 1996.
65. Clinical Forum on Chronic Pain Management – Moderator  
 American Society of Anesthesiology 1996 Annual Meeting – New Orleans, October 1996.
66. Regional Nerve Blocks for Pain Management  
 Midwest Anesthesia Conference, Chicago, Illinois, May 1997.
67. Epidural Analgesia for Pain Relief Following Spine Surgery  
 Department of Orthopedic Surgery, Section of Spinal Surgery, Rush-Presbyterian-St. Luke's Medical Center, Chicago, October 1997.
68. Regional Anesthesia in Patients Receiving Anticoagulants  
 16<sup>th</sup> Annual Symposium Clinical Update in Anesthesiology, San Juan, Puerto Rico, January 1998.
69. Anticoagulation, Regional Anesthesia and the Vascular Surgery Patient  
 Midwest Clinical Conference, Chicago, February 1998.
70. Preemptive and Neuraxial Analgesia: Can It Really Decrease Patient Morbidity?  
 Wisconsin Society of Anesthesiologists. 51<sup>st</sup> Annual Fall Meeting, Spring Green, Wisconsin, September 1998.
71. Controversies of Interventional Pain Management  
 Illinois Society of Anesthesiologists 1998 Annual Fall Meeting, Chicago, Illinois, October 1998.
72. Regional Nerve Blocks in the Management of Complex Regional Pain Syndrome. St. Joseph's Hospital. CME Lecture. Department of Anesthesiology, South Bend, Indiana, December 1998.
73. Management of Complex Regional Pain Syndrome and other chronic pain syndromes.  
 Oak Park Hospital Grand Rounds, Oak Park, Illinois, April 1999.
74. Management of Post-thoracotomy Pain  
 18<sup>th</sup> Annual Symposium, Clinical Update in Anesthesiology, Acapulco, January 2000.
75. Management of Complex Regional Pain Syndrome. Advanced strategies in case management and practice management. Oak Brook, IL. Feb. 2000.
76. Diagnosis and Management of Complex Regional Pain Syndrome.  
 The Midwest Pain Society  
 24<sup>th</sup> Scientific Meeting and 20<sup>th</sup> Anniversary Celebration, Chicago, IL. March 2000.
77. Complex Regional Pain Syndrome. A New Name for an Old Disease. Illinois Workers Compensation Lawyers Association, Ltd. Annual Medical Seminar, Chicago, IL, September 2001.
78. Complex Regional Pain Syndrome, Medtronic Speakers Bureau, New Orleans, LA. October 2001.

79. Post Thoracotomy Pain. Clinical Update in Anesthesiology. 20<sup>th</sup> Annual Symposium. Paradise Island, Bahamas. January 2002.
80. Clinical Algorithm for the Management of Complex Regional Pain Syndrome. Medtronic Speaker Bureau. Milwaukee, WI. April 2002.
81. Clinical Algorithm for the Management of Complex Regional Pain Syndrome. Midwest Anesthesia Conference, Chicago. Clinical Algorithm for the Management of Complex Regional Pain Medicine. Emerging Trends. April 2002. in Pain Medicine CME Meeting. Alsip, IL. August 2002.
82. Post Thoracotomy Pain Management. Clinical Update in Anesthesiology. 21<sup>st</sup> Annual Symposium. Antigua, BWI. January 2003.
83. Management of CRPS and other Chronic Pain Syndromes. Department of Orthopedic Surgery. Resident Conference, Rush University Medical Center, April 2003.
84. Symposium: Surgical treatments for non-surgeons and surgeons, Spinal Cord Stimulation. World Spine II Conference, Chicago, August 2003
85. Failed Back Syndrome. World Spine II Conference, Chicago, August 2003
86. Continuous Methods of Analgesia. Consensus Workshop Taxonomy and Algorithm for Complex Regional Pain Syndrome. Budapest, Hungary. August 2003
87. Intervention Procedures – Role in Functional Improvement Consensus Workshop. Taxonomy and Algorithm for Complex Regional Pain Syndrome. Budapest, Hungary. August 2003
88. Putting It All Together: Treatment Algorithms and Options for Managing Patients with CRPS. Refresher Course Lecture . American Society of Anesthesiologists Annual Meeting. Las Vegas, NV Oct. 2004.
- 89-90. Advances in Neurostimulation
  - Medtronic Speaker's Bureau, Chicago January 2005
  - Medtronic Speaker's Bureau, Detroit, January 2005
91. Fluoroscopic Guidance is Required for all Epidural Steroid Injection. CON: Midwest Anesthesiology Conference, Chicago, May 2005
92. Management of Complex Regional Pain Syndrome. Medtronic Speaker Bureau, Detroit, July, 2005.
93. Spinal Cord Stimulation Cadaver Course. Medtronic Speakers Bureau, Detroit, August 2005.
94. Outcome for Neurostimulator and Drug Delivery Systems. Medtronic Implantable Pain Therapies, Denver, August 2005.
95. Neurostimulation Complications and Management, Medtronic Implantable Therapies, Denver, August 2005.
96. Spinal Cord Stimulation/Intrathecal Drug Delivery, Cadaver Course Medtronic Speakers Bureau, Denver, August 2005.
97. Review of Current Understanding of Mechanisms of CRPS. Refresher Course Lecture ASA Annual Meeting, Atlanta, Georgia, October 22-26, 2005
98. How Long Do We Continue the Pharmacotherapy and Nerve Blocks in the Postoperative Phase? ASA Annual Meeting, Atlanta, Georgia, October 22-26, 2005
99. Cadaver Workshop. Epidural Adhesiolysis. ASA Annual Meeting, Chicago, October 2006.
100. Complex Regional Pain Syndrome: Diagnosis and Management. Refresher Course Lecture. ASA Annual Meeting, Chicago, October 2006.
101. Neurostimulation Trialing Options and Implants Technique. Theory & Technique— Implantable Pain Therapies, Medtronic, Chicago, March 2007.

102. Neurostimulation Case Discussion. Theory & Technique— Implantable Pain Therapies, Medtronic, Chicago, March 2007.
103. Cadaver Workshop. Theory & Technique— Implantable Pain Therapies, Medtronic, Chicago, March 2007.
104. Neurostimulation Training Options and Implant Technique. Theory & Technique— Implantable Pain Theories Medtronic, Minneapolis, June 2007.
105. Trialing and Implant Techniques for Intrathecal Analogues Theory. Theory and Technique—Implantable Technique—Implantable pain theories, Medtronic, June 2007.
106. Cadaver Course Workshop. Medtronic Theory and Techniques—Implantable Pain Theories, Minneapolis, June 2007.
107. Outcomes for Neurostimulation and Drug Delivery Systems. Theory at Techniques— Implantable Pain Theories, Medtronic, Denver, September 2007.
108. Trialing and Implant Techniques for Intrathecal Analgesia Therapy. Theory & Techniques. Implantable Pain Theories. Medtronic, Denver, September 2007.
109. Cadaver Course Workshop. Theory & Technique—Implantable Pain Theories, Medtronic, Denver, September 2007.
110. Dorsal Column Stimulation for Chronic Pain Moderator. Implant Technique and New Options for Spinal Cord Stimulation American Society of Anesthesiologist Annual Meeting, San Francisco, October 2007.
111. Complex Regional Pain Syndrome: Diagnosis and Management Refresher Course Lecture. ASA Annual Meeting, Oct. 2007.
112. Neuropathic Pain. The Second Annual Pain Management Symposium & War on Pain. Hoffman Estates, IL, Oct. 2007.
113. Interventional Pain Treatment for Low Back Pain and Complex Regional Pain Syndrome. CME Course for Rehabilitation Nurses and Case Managers. Oak Brook, October 2007.
114. Trial and Permanent Implant Techniques for Spinal Cord Stimulation. American Society of Regional Anesthesia and Pain. Annual Meeting; Pain Fellows' Cadaver Course. Boca Raton, FL, November 2007.
115. Trialing and Implant Technique for Spinal Cord Stimulation Theory & Technique Implantable Pain Theories, Medtronic Speaker, Bureau Chicago, March 2008.
116. Outcomes for Spinal Cord Stimulation and Intrathecal Drug Delivery. Theory & Technique—Implantable Pain Theories, Medtronic Speaker Bureau, Chicago, March 2008.
117. Outcomes for Spinal Cord Stimulation and Intrathecal Drug Delivery. Theory & Technique—Implantable Pain Theories, Medtronic Speaker, Bureau Minneapolis, March 2008.
118. Spinal Cord Stimulation Implant Techniques: Boston Scientific Pain Fellows Training Course, Minneapolis, April 2008.
119. Spinal Cord Stimulation Implant Techniques: Boston Scientific Pain Fellows Training Course, Chicago, Sept. 2008.
120. New Approaches to the Treatment of Neuropathic Pain: Alexian Brothers Hospital Network CME Consortium, Hoffman Estates, Oct. 2008.
121. Intrathecal Drug Delivery for Treatment of Chronic Pain—Mechanisms and Management, Moderator, Indications and Options for Trial Techniques for Intrathecal Drug Delivery, ASA Annual Meeting, Orlando, Oct. 2008.
122. Complex Regional Pain Syndrome: Diagnosis and Management. Refresher Course Lecture ASA Annual Meeting, Orlando, Oct. 2008.

123. Trialing and Implant Techniques for the Intrathecal Drug Delivery: Medtronic Theory & Technique, Implantable Pain Theories, Chicago, Nov. 2008.
124. Outcomes for Neurostimulation of Intrathecal Drug Delivery: Medtronic Theory & Technique, Implantable Pain Theories, Chicago, Nov. 2008.
125. CRPS and RSD. American Society of Regional Anesthesia and Pain. Annual Meeting, Huntington Beach, Nov. 2008.
126. Advanced Neuromodulation. American Society of Regional Anesthesia and Pain. Annual Meeting, Huntington Beach, Nov. 2008.
127. Trials and Implantation. Spinal Cord Stimulation Implant Techniques. Boston Scientific Fellows Course Boston Scientific Fellow Cadaver Training Course, Huntington Beach, Nov. 2008
128. Implantable Drug Delivery Systems. American Society of Regional Anesthesia and Pain. Annual Meeting, Huntington Beach, Nov. 2008.
129. Current Trends in Intrathecal Therapy: Sponsored by Flan Pharmaceuticals. Huntington Beach, Nov. 2008.
130. Spinal Cord Stimulation Implant Techniques. Boston Scientific Fellows Course Boston Scientific Fellow Cadaver Training Course, Chicago, Sept. 2009.
131. Trialing and Implant Techniques for Spinal Cord Stimulation. Theory & Technique, Implantation Pain Theories, Medtronic Speaker Bureau, Chicago, Jan. 2009.
132. Spinal Cord Stimulation Implant Techniques: Boston Scientific Pain Fellows Training Course, San Antonio, Jan 2009.
133. Trialing and Implant Techniques for Spinal Cord Stimulation. Theory & Technique, Implantation Pain Theories, Medtronic, Fellow Cadaver Training Course, Chicago, Aug. 2009.
134. Challenging Course for Intraspinial Analgesia, Medtronic Speaker Bureau, South Bend IN, April 2009
135. Challenging Cases for Intraspinial Analgesia, Medtronic Speaker Bureau, Grand Rapids, MI, May 2009
136. Trial and Implantation Technique for Spinal Cord Stimulation, Boston Scientific Fellow Cadaver Training Course, Chicago, Sept. 2009.
137. Intrathecal Drug Delivery Complications, Medtronic Fellow Theory and Technique—Implantable Pain Theories, Denver. Sept. 2009.
138. Intrathecal Drug Delivery Complications, Medtronic Fellow Theory and Technique—Implantable Pain Theories, Denver, Oct. 2009
139. Medtronic Fellow Theory and Technique—Implantable Pain Theories, Cadaver Course Denver, Nov. 2009
140. Complex Regional Pain Syndrome. Refresher Course Lecture, ASA Annual Meeting, New Orleans, Oct. 2009
141. Sympathetically and Non-Sympathetically Medicated Pain in Complex Regional Pain Syndrome, Refresher Course Lecture, American Society of Regional Anesthesia and Pain. Annual Pain Medicine Meeting and Workshops, San Antonio, TX, Nov. 2009.
142. Current Pain Practice Guidelines, American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops, San Antonio, TX, Nov. 2009.
143. Spinal Cord Stimulation, Cadaver Workshop , American Society of Regional Anesthesia and Pain. Annual Pain Medicine Meeting and Workshops, San Antonio, TX, Nov. 2009.



144. Selection of Patients for Spinal Cord Stimulation, Physician Assistants Educational Program, American Society of Regional Anesthesia and Pain. Annual Pain Medicine Meeting and Workshops, San Antonio, TX, Nov. 2009.
145. New Concepts in the Diagnosis and Treatment of CRPS. Michigan Society of Anesthesiology Annual Meeting. Detroit, MI Feb. 2010
146. Medtronic Fellow Theory and Technique—Implantable Pain Theories, Cadaver Course Chicago, March, 2010
147. Emerging Trends in the Diagnosis and Treatment of CRPS. 7<sup>th</sup> Congress of the Polish Pain Society. Gdansk, Poland September 2010
148. Complex Regional Pain Syndrome –Emerging New Trends. Illinois Worker’s Compensation Annual Medical Seminar. Chicago, September 2010
149. New Trends in Complex Regional Pain Syndrome. ProAssurance Annual Seminar Chicago September 2010
150. Basic Neuro-Anatomy and Neurophysiology of Pain: Pathways and Transmission. Virginia Commonwealth University Pain Management Symposium 2010 Richmond, VA October 2010
151. Pathology, Neuroplasticity: What are the Neurological Changes Responsible for Chronic Pain. Virginia Commonwealth University Pain Management Symposium 2010 Richmond, VA October 2010
152. Advanced and Cutting Edge Therapies for Chronic Pain- Pain Pumps and Neurostimulators: Who Are Right Candidates, Are They Medically Cost Effective. Virginia Commonwealth University Pain Management Symposium 2010 Richmond, VA October 2010
153. Emerging Trends in the Diagnosis and Treatment of Complex Regional Pain Syndrome Refresher Course Lecture, ASA Annual Meeting, San Diego, CA October 2010
154. Neuroanatomy, Electrophysiology and Pathophysiology of Pain Pathways Comprehensive Pain Medicine and Interventional Pain Management 2010 Board Review Course. ASIPP Chicago, IL August 2010
155. Headache and Facial Pain. Comprehensive Pain Medicine and Interventional Pain Management 2010 Board Review Course. ASIPP Chicago, IL August 2010
156. Complications of Spinal Cord Stimulation. American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops. Phoenix. November 2010
157. Spinal Cord Stimulation Cadaver Workshop. American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops. Phoenix. November 2010
158. Spinal Cord Stimulation - Updates and Troubleshooting. Physician Assistant / Nurse Practitioner Education Program. American Society of Regional Anesthesia and Pain Medicine. Annual Pain Medicine Meeting and Workshops. Phoenix. November 2010
159. Trialing and Implant Techniques for Spinal Cord Stimulation. Theory & Technique, Implantation Pain Theories, Medtronic, Fellow Cadaver Training Course, Chicago, August 2010
160. Indications for Spinal Cord Stimulation. Boston Scientific Fellow Cadaver Training Course, Chicago, August. 2010.
161. Indications and Outcomes for Spinal Cord Stimulation. Boston Scientific Fellow Cadaver Training Course, Phoenix. November 2010
162. Indications and Outcomes. Physician SCS Training Workshop. Boston Scientific Neuromodulation. Las Vegas. February 2010
163. Intraspinal Analgesia-Challenging Cases. Azur Pharmaceutical Speakers Bureau Leawood, Kansas. June 2010

164. Intraspinal Analgesia-Challenging Cases. Azur Pharmaceutical Speakers Bureau University of Cincinnati Pain Fellow Journal Club. February, 2011
165. Spinal Cord Stimulation Cadaver Workshop. American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops. Phoenix. November 2011
166. Indications for Spinal Cord Stimulation. Boston Scientific Fellow Cadaver Training Course, Chicago, August. 2011.
167. Diagnosis and Treatment of Complex Regional Pain Syndrome Refresher Course Lecture, ASA Annual Meeting, San Diego, CA October 2011
168. Indications for Spinal Cord Stimulation. Boston Scientific Fellow ASRA Cadaver Training Course, New Orleans, November, 2011
169. Clinical Update in CRPS-What's New? American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops. New Orleans, November 2011
170. Diagnosis and Management of Low Back Pain. Solutions to Challenging Workers Compensation Cases. Diamond Mark Event. Oak Brook. November 2011
171. Advanced and Cutting Edge Therapies for Chronic Pain – Pain Pumps and Neuro-Stimulators: Who are the Right Candidates, are they Medically and Cost Effective? Visiting Professor at Wayne State University/Detroit Medical Center. Detroit, MI January 2012.
172. Preemptive Analgesia – Past, Present and Future. Visiting Professor at Wayne State University/Detroit Medical Center. Detroit, MI January 2012
173. Tunneled Epidural Catheters in the Management of Arthrofibrosis Following Knee Surgery. Becker's 10<sup>th</sup> Annual Orthopedic, Spine and Pain Management –Driven ASC Conference. Chicago June 2012
174. CRPS New Diagnostic Criteria and Treatment Update. Farmers Business Insurance Company. Naperville, IL February 2012.
175. Complex Regional Pain Syndrome New Treatment Alternatives. Case Management Society of America (CMSA) Quarterly Meeting. Oak Brook, IL February 2012
176. Chicago Pain Fellows Annual Medtronic Neuromodulation Training course . Spinal Cord Stimulation Indications. Chicago, July 2012
177. Chicago Pain Fellows Annual Boston Scientific Spinal Cord Stimulation Training Course.SCS Indications and Techniques. Chicago, August 2012
178. First Annual Chicago Pain Fellows Training Course in Radiofrequency and Discography Techniques. Indications and Complications of Lumbar Discography. Chicago, September, 2012
179. New Updates in the Diagnosis and Management of CRPS. Refresher Course Lecture . ASA Annual Meeting, Washington, DC October 2012
180. CRPS - Current Best Practice-Future Diagnostics and Treatment. American Society of Regional Anesthesia and Pain Annual Pain Medicine Meeting and Workshops. Miami, November 2012
181. Indications for Spinal Cord Stimulation. Boston Scientific Fellows ASRA Spinal Cord Stimulation Training Cadaver Training Course, Miami, November, 2012
182. Diagnosis and Management Complex Regional Pain Syndrome. . Solutions to Challenging Workers Compensation Cases. Diamond Mark Event. Oak Brook. April 2013
183. Chicago Pain Fellows Annual Medtronic Neuromodulation Training course . Spinal Cord Stimulation Indications. Chicago, August 2013

184. Chicago Pain Fellows Annual Boston Scientific Spinal Cord Stimulation Training Course. SCS Indications and Techniques. Chicago, August 2013
185. Second Annual Rush University Medical Center 2013 Midwest Fellowship Workshop Radiofrequency and Discography Techniques. Indications and Complications of Lumbar Discography.  
Peripheral Denervation for Osteoarthritis  
Chicago, September, 2013
186. Updates in the Diagnosis and Management of CRPS. Refresher Course Lecture. ASA Annual Meeting, San Francisco, October 2013
187. St. Jude Medical Neuromodulation for Pain Fellows 101 Course.  
Downers, Grove, IL October 2013
188. Indications for Spinal Cord Stimulation. Boston Scientific Fellows ASRA Spinal Cord Stimulation Training Cadaver Training Course, Phoenix, November, 2013
189. Workshop in Techniques in Neuromodulation: Cranial Neuromodulation - Supraorbital, Infraorbital and Occipital. 12<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting Phoenix, November 2013
190. Hands- on Fluoroscopy Workshop; Superior Hypogastric Plexus, Lumbar Sympathetic and Ganglion Impar Nerve Blocks. 12<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting Phoenix, November 2013
191. Innovation Focused on Pain Relief. Coverage and Flexibility with Case Studies. Boston Scientific *Precision Spectra* SCS Event. Phoenix, November 2013
192. St. Jude Medical Neuromodulation for Pain Fellows 202 Course.  
Plano, TX, April, 2014
  
193. Chicago Pain Fellows Annual Medtronic Neuromodulation Training course . Spinal Cord Stimulation Patient Selection for SCS. Chicago, August 2014
194. St. Jude Medical Neuromodulation for Pain Fellows 101 Course.  
Los Angeles, August, 2014
195. Chicago Pain Fellows Annual Boston Scientific Spinal Cord Stimulation Training Course. SCS Indications and Techniques. Chicago, August 2014
196. Diagnosis and Management of Peripheral Neuropathy. A Refresher Course Lecture . ASA Annual Meeting, New Orleans, October 2014
197. ASA Annual meeting. Moderator and proctor for Cadaver Workshop. Cervical and thoracic injection techniques . New Orleans October 2014
  
199. St. Jude Medical Neuromodulation for Pain Fellows 101 Course.  
Chicago, IL October 2014
199. Techniques for implantation. Boston Scientific Fellows ASRA Spinal Cord Stimulation Training Cadaver Training Course, San Francisco, November, 2014
200. Pathophysiology of Complex Regional Pain Syndrome. A 13<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. San Francisco, November 2014
201. Special Session Workshop. Spinal Cord Stimulation 13<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. San Francisco, November 2014

202. Intrathecal Drug Delivery Indications. Visiting Professorship. University of Iowa Pain Fellows Training Program. Iowa City, September 2014
203. Indications for Spinal Cord Stimulation. Boston Scientific Physician's Assistant Meeting St. Louis. March 2015
204. Enhanced Recovery after Surgery. 13th Annual Spine, Orthopedic & Pain Management-Driven ASC Conference + The Future of Spine Chicago. June 2015
206. Fourth Annual Rush University Medical Center 2013 Midwest Pain Fellowship Workshop Radiofrequency and Biaculoplasty Techniques. Chicago July 2015
207. Chicago Pain Fellows Annual Medtronic Neuromodulation Training course . Spinal Cord Stimulation Indications Burr Ridge, IL. August 2015
208. Indications for Spinal Cord Stimulation. Boston Scientific Fellow Cadaver Training Course, Chicago, August. 2015.
209. Best Practices for Trial of Spinal Cord Stimulation. St. Jude Medical. Neuromodulation for Fellows 101. Foundations for Spinal Cord Stimulation and Radiofrequency. New York September 2015
210. Pain treatment Algorithm, Patient Selection. Neuromodulation for Fellows 101. Foundations for Spinal Cord Stimulation and Radiofrequency. New York September 2015
211. Update in the Diagnosis and Management of Peripheral Neuropathy. Refresher Course Lecture . ASA Annual Meeting, San Diego, October 2014
212. Cadaver Workshop Moderator. Sympathetic Chain Nerve Blocks and Neurolytic Procedures (Stellate, Splanchnic Nerve, Celiac Plexus, Superior Hypogastric Plexus, Lumbar Sympathetic, Ganglion Impar). 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
213. Sympathetic Blocks: Is There a Place for Them in Complex Regional Pain Syndrome (CRPS)? 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
214. Hot Topics in Pain Medicine: CRPS: Assessment, Diagnosis, Treatment, and Outcome 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
214. Pro-Con Debates: Single Shot vs. Continuous Trial of Intrathecal Pumps: Intrathecal Pump Trials: Continuous Catheter Trial. 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
216. Ketamine: An Old Drug and New Tricks? Ketamine for Chronic Pain. 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
217. Complex Regional Pain Syndrome in the Adult: Ketamine Infusion for the Treatment of CRPS: What Is the Evidence? 14<sup>th</sup> Annual American Society of Regional Anesthesia and Pain Medicine Annual Meeting. Miami November 2015
218. Proctor at North American Neuromodulation Society Annual meeting Cadaver lab Spinal Cord Stimulation. Las Vegas. December 2015
219. DRG stimulation – Chicago experience. Axiom<sup>TM</sup> Neurostimulation System Education Program. Dallas May 2016
220. Enhanced Recovery After Surgery. . 14th Annual Spine, Orthopedic & Pain Management-Driven ASC Conference + The Future of Spine Chicago. June 2016

221. DRG stimulation – Chicago experience. Axium™ Neurostimulation System Education Program. Dallas August 2016.
222. Chicago Pain Fellows Annual Medtronic Neuromodulation Training course . Spinal Cord Stimulation Patient Selection for SCS. Chicago, August 2016
223. Indications for Spinal Cord Stimulation. Boston Scientific Fellow Cadaver Training Course, Chicago, August. 2016.
224. Fifth Annual Rush University Medical Center Midwest Pain Fellowship Workshop Radiofrequency and Biaculoplasty Techniques. Downers Grove, IL August 2016
225. Neuromodulation 101 for Pain Medicine Fellows- Foundations for Spinal Cord Stimulation, Dorsal Root Ganglion Stimulation and Radiofrequency Techniques Boston September 2016.
226. Chicago Pain Fellows Annual St. Jude Medical Spinal Cord Stimulation Cadaver Course Chicago, September 2016
227. Review of Neuroanatomy and Neurophysiology for Treatment of Neuropathic Pain. ASA Annual Meeting October 2016
228. St. Jude Medical National Neuromodulation Course 201 Fellows. Medical Neurophysiology and Modulation of Nociception , Irving, TX November 2016
229. Topics in Neuromodulation Symposium. Sponsored by St. Jude Medical. San Diego November 2016
230. The Patient’s Pains, Well Being and User Experience: Is Treating the Pain Enough. Sponsored By St. Jude Medical. San Diego November 2016
231. Sympathetic Blocks Upper Body and Abdomen (Cervico-Thoracic Chain, Splanchnic and Celiac). Hands On Fluoroscopy Workshop. ASRA 15<sup>TH</sup> Annual Pain Medicine Meeting San Diego, November 2016
232. Fusion: Bridging from Fluoroscopy to Ultrasound for Blocks of the Head and Neck - Trigeminal Ganglion, SPG, Cervical Medial Branches/TON, Stellate Ganglion. Hands On Fluoroscopy Workshop. ASRA 15<sup>TH</sup> Annual Pain Medicine Meeting San Diego, November 2016
233. North American Neuromodulation Advanced DRG Cadaver course. Las Vegas January 2017
234. North American Neuromodulation Annual Meeting. Fellows Workshop Advanced Neuromodulation Cadaver course. Las Vegas January 2017
235. Axium™ Neurostimulation System Education Program. Dallas. March 2017
236. Axium™ Neurostimulation System Education Program. Dallas. April 2017
237. Axium™ Neurostimulation System Education Program. Dallas. May 2017
238. Axium™ Neurostimulation System Education Program. Dallas. June 2017
239. New Methods for Managing Postoperative Pain Following Orthopedic and Spinal Procedures. Becker's 15th Annual Spine, Orthopedic & Pain Management-Driven ASC Conference + The Future of Spine. Chicago, June 2017
240. What is the Best Method to Treat Disease: DRG Stimulation or other forms of Neuromodulation: Upper Extremity Pain. International Neuromodulation Society 13<sup>th</sup> World Congress. Edinburgh, Scotland. May 2017
241. Dorsal Root Ganglion Stimulation : Best Practices. West Virginia Society of

- Interventional Pain Practice. Miami. July 2017
242. Sixth Annual Rush University Medical Center Midwest Pain Fellowship Workshop Radiofrequency and Biaculoplasty Techniques. Halyard Medical. Chicago, IL August 2017
  243. Neuroanatomy and Neurophysiology of Pain. Boston Scientific Fellow Cadaver Training Course, Chicago, August. 2017.
  244. Neuroanatomy and Neurophysiology of Pain. Boston Scientific Fellow Cadaver Training Course, Chicago, September. 2017.
  245. Neuromodulation 101. Introduction to SCS, DRG, and RFA Abbott National Fellows Course. Dallas. September 2017
  246. Chicago Pain Fellows Annual St. Jude Medical Spinal Cord Stimulation Cadaver Course Chicago, October 2017
  247. Pain Fellows Fundamental. Chicago Pain Fellows Cadaver Course, Medtronic, Chicago. November, 2017
  248. Novel SCS Technology and Techniques for Trials (DRG, Epidural Introducer Sheath, Retrograde/Caudal Approaches). ASRA 16<sup>th</sup> Annual Pain Medicine Meeting. Orlando November., 2017
  249. DRG Stimulation: Trials and (Implant) Tribulations. PBLD. ASRA 16<sup>th</sup> Annual Pain Medicine Meeting. Orlando November, 2017
  250. Surgical Practicum for Implantation of Spinal and Peripheral Nerve Stimulators, Laminotomy (Paddle) Leads and IDDS. ASRA 16<sup>th</sup> Annual Pain Medicine Meeting. Orlando. November, 2017
  251. Neural Targeting and the Challenge of Treating Chronic Pain. Boston Scientific Scientific Presentation. Orlando. November 2017
  252. North American Neuromodulation Annual Meeting. Fellows Workshop Advanced Neuromodulation Cadaver course. Las Vegas January 2018
  253. Contemporary Pain Management. State of the Art Perioperative Pain Control. 4<sup>th</sup> Annual Kauai Pain Conference. Kauai. March 2018
  254. Procedural – Based Innovations for Pain Management. 4<sup>th</sup> Annual Kauai Pain Conference. Kauai. March 2018
  255. Neuromodulation Comprehensive Workshop 2018 World Congress on Regional Anesthesia and Pain Medicine. New York City. April 2018
  256. Problem Based Learning Discussion DRG Challenging case. 2018 World Congress on Regional Anesthesia and Pain Medicine. New York City. April 2018
  257. Complex Regional Pain Syndrome. Interventional Treatments. Understanding the Evidence. 2018 World Congress on Regional Anesthesia and Pain Medicine. New York City. April 2018
  258. Chronic Pain Advanced Neuromodulation Techniques. 2018 World Congress on Regional Anesthesia and Pain Medicine. New York City. April 2018
  259. Chronic Pain Fellow/Resident Cadaver Workshop Fluoroscopy – Guided Injections. 2018 World Congress on Regional Anesthesia and Pain Medicine. New York City. April 2018
  260. Outcomes with the new Spectra WaveWriter™ SCS System. Midwest Society of Interventional Pain Physician Dinner Symposium. Chicago. June 2018

## RESEARCH GRANTS

1. Development of Pain Management Provider Epidural Pump 1991 (Abbott Labs)
2. A Multicenter Open Label Study of the Safety and Tolerability of Sustained Release Tramadol Hydrochloride in Chronic Pain Patients, 1998-1999 Principal Investigator (Purdue Pharma Grant \$57,000) – Completed
3. Multicenter, Blinded, Randomized, Placebo Controlled Study of 0.05% Clonidine Gel in Patients with Post-Herpetic Neuralgia, 1999 (Curatek Pharmaceuticals; Grant: \$50,000 Principal Investigator) – Completed
4. Multicenter, Blinded, Randomized, Placebo Controlled Study of 0.05% Clonidine Gel in Patients with Post-Diabetic Neuralgia, 1999 (Curatek Pharmaceuticals; Grant: \$50,000 Principal Investigator) – Completed
5. Safety, efficacy and impact of quality of long term administration of Dilaudid CR for patients with chronic low back pain, 1999 (Knoll Pharma; Grant: \$65,000, Co-investigator) – Completed
6. Pain Medicine Data Bank for the Rush Pain Clinic at Rush University, 1999 (Roxane, Grant: \$25,000, Co-investigator) – Completed
7. National Data Bank on Advanced Pain Therapy for Low Back Pain, 1999-2001 Grant: \$3,000 (Medtronic, Principal Investigator) – Completed
8. A prospective clinical trial to evaluate the cerebrospinal fluid and plasma pharmacokinetics of rofecoxib with single and multiple oral drug administration in subjects with implanted drug pumps with sampling side ports and lumbar intrathecal catheters for the control of chronic pain. (PI: Merck Medical School Grant: \$78,000)
9. A randomized placebo controlled study comparing efficacy of Hydromorphone HCL extended release and Duragesic in subjects with non-malignant pain. Co-investigator (Purdue Pharma) 2003.
10. Double blind multicenter study of the efficacy of Parecoxib followed by Valdecoxib compared to placebo in general surgery patients for the treatment of post-surgical pain. Co-investigator (Pharmacia) – Completed
11. Randomized, double-blind active controlled study of the safety and efficacy of SKY0404 (Propofol 2%) versus Diprivan injectable emulsion 1% in balanced anesthesia. Co-investigator (SkyPharma) – Completed
12. Study on analgesic efficacy safety and tolerability of AR-P900758XX a six week randomized double blind placebo-controlled dose finding multicenter study comparing AR-P900758XX with Vioxx and with Naproxen in subjects with Osteoarthritis of the Knee Co-investigator (Astra-Zeneca), 2002.
13. Double blind study of the efficacy and safety of a single dose of IV Parecoxib sodium followed by seven days of oral Valdecoxib for the pain following laparoscopic cholecystectomy. Co-Investigator (Pharmacia; Grant \$16,000) 2001 – Completed

14. The safety and efficacy of Electrotransport (E-TRANS) Fentanyl compared to IV PCA Morphine for the treatment of postoperative pain. Principal investigator (Alza; Grant: \$120,000) 2000 – Completed
15. An open evaluation of safety and clinical utility of E-TRANS (fentanyl) for management of postoperative pain in children and adolescents. Co-investigator (Alza; Grant \$100,000) 2000 – Completed
16. A Randomized, Double-Blinded, Placebo-Controlled Study of Intrathecal Ziconotide in Adults with Severe Chronic Pain. ELN92045-301. Grant \$43,020.00. Principal Investigator—completed.
17. Restore™ Spinal cord Stimulation characterization study. Principal Investigator (Medtronic: Grant \$121,000) 2005-2006 completed
18. Prism™ Occipital nerve stimulation for migraine Principal Investigator (Boston Scientific) completed 2006-2013
19. A Multicenter, Randomized, Double-Blind, Placebo-Controlled Trial to Evaluate the Efficacy and Safety of the Sufentanil NanoTab® PCA System/15 mcg for the Treatment of Post-Operative Pain in Patients after Open Abdominal Surgery. ( Pharmanet) 2013-2014 Completed
20. A Randomized Controlled Study to Evaluate the Safety and Effectiveness of the Precision Spinal Cord Stimulating System Adapted for High Rate Spinal Cord Stimulation Principal Investigator (Boston Scientific 2014- present)
22. A Randomized, Double-Blind, Placebo-Controlled Study to Assess the Efficacy and Safety of AXS-02 (Disodium Zoledronate Tetrahydrate) Administered Orally to Subjects with Complex Regional Pain Syndrome Type I (CRPS-I) Principal Investigator. (Axesome Therapeutics 2016 - present)
23. Data Collection Study of CRPS Patients Undergoing DRG Implant . Principal Investigator. (Departmental 2016- present)
24. TARGET: A Post-Approved Study to Evaluate Targeted SCS (DRG) Stimulation for the Management of Moderate to Severe Chronic, Intractable, Pain of the Lower Limbs due to CRPS Types I and II. Principal Investigator. ( St. Jude Medical 2016- present)
25. Open-Label Safety Trial of Intravenous Neridronic Acid in Subjects with Complex Regional Pain Syndrome (CRPS). Principal Investigator. (Grunenthal 2016- present)
26. Improving functional outcomes and lowering health care costs by enhanced integration of primary care providers and pain medicine physicians for the management of chronic non-cancer pain patients. (PCP/PMS) Sub Investigator. (Pfizer/Departmental 2015- present)
27. A Phase 3, Randomized, Double-Blind, Placebo-Controlled, Multicenter, Evaluation of the Safety of N1539 Following Major Surgery. Sub Investigator (Trevena 2015- present)
28. A Multicenter, Randomized, Double-Blind, Placebo-Controlled, Adaptive Design Study Evaluating The Analgesic Efficacy and Safety of Intravenous CR845 In Patients Undergoing Abdominal Surgery. Sub Investigator (Kimberly Clark/ Halyard Medical 2015- present )

## PATENTS

1. United States Patent Granted on July 7, 1998, Patent No. 5,776,053, Laryngoscope Blade with Protective Insert. Branislav M, Dragisic and Lubenow T, Inventors.



2. United States Patent Granted on August 31, 2010, Patent No. 7,787,960, Lead Anchoring Assembly. Lubenow T, Chinn K, G.Neppie C, Barker J, Inventors.