

Ben Roitberg, M.D.

Professor and Chair
Department of Neurosurgery/Neurosciences
MetroHealth Medical Center
Case Western Reserve University
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Cleveland, OH 44109

SUMMARY OF KEY CURRENT APPOINTMENTS

2012 Editor in Chief, Neurological Research
2012 Member, World Federation of Neurosurgical Societies Spine Committee
2014 Chair, subcommittee on publications of the WFNS Spine Committee.
2015 Chair, Advisory Board, ImmersiveTouch Simulation
2016 Chair, Department of Neurosurgery/Neuroscience; MetroHealth
2016 Clinical Professor of Neurosurgery, Case Western Reserve University School of Medicine

PAST ACADEMIC APPOINTMENTS

2000– 2006 Assistant Professor, Department of Neurosurgery, the University of Illinois at Chicago.
2006-2008 Associate Professor, Department of Neurosurgery, UIC.
2001-2008 Quality Assurance Liaison, Department of Neurosurgery.
2002-2008 Director, Neurosurgical Intensive Care Unit
2004-2007 Medical Director, Neuroscience Unit, Alexian Brothers Medical Center
2005-2008 Director, Illinois Project to Cure Stroke, Neural Repair laboratory, Chicago IL
2007-2008 Director, Spine and Peripheral Nerve Neurosurgery, UIC
2007-2008 Medical Director, Neurosurgery Clinic, UIC
2008-2013 Associate Professor, Section of Neurosurgery, The University of Chicago.
2013 - 2016 Professor of Surgery, Section of Neurosurgery, The University of Chicago
2011 - 2016 Director, Neurosurgery Residency Program, The University of Chicago

ACADEMIC TRAINING

1981– 1987 Hebrew University-Hadassah Medical School
1988 - 1989 Rotating Internship: Assaf Harofeh Medical Center, Zerifin, Israel
1993 - 2000 Neurosurgery Residency, the University of Illinois at Chicago, including:
1993 - 1994 Surgery Internship
1997 - 1999 Research Fellowship
1999 - 2000 Chief Resident

BOARD CERTIFICATION

American Board of Neurological Surgery
Recertified 2014

June 2004

SCHOLARSHIP

(a) Peer-reviewed publications in the primary literature:

1. Verity M.A., **Roitberg B**, Kepes JJ. Mesolimbocortical Dementia: clinico-pathological studies on two cases. *J Neurol. Neurosurg. Psychiat.*, 1990, 53:492-5.

2. Arlazoroff A, **Roitberg B**, Werber E, Shidlo R, Berginer VM. Epileptic seizure as a presenting symptom of cerebrotendinous xanthomatosis. *Epilepsia* 1991, 32: 657-61.
3. **Roitberg B**, Dujovny M, Lim J. Ultrapower surgical drill system evaluation. *Surg Neurol* 1997;47:392-3.
4. **Roitberg B**, Tomita T, McLone DG. Abdominal CSF Pseudocysts: a complication of ventriculoperitoneal shunts in children. *Pediatric Neurosurgery*, Nov 1998;29:267-273.
5. Kordower JH, Bloch J, Ma SY, Chu Y, Palfi S, **Roitberg B**, Emborg M, Hantraye P, Deglon N, Aebischer P. Lentiviral gene transfer to the nonhuman primate brain. *Experimental Neurology*, Nov 1999;160(1):1-16.
6. **Roitberg B**. Cell transplantation in the nervous system. *Surg Neurol* July 1999;52(1):13-16.
7. Kordower JH, Emborg ME, Bloch J, Ma SY, Chu Y, Leventhal L, McBride J, Chen EY, Palfi S, **Roitberg BZ**, Brown WD, Holden JE, Pyzalski R, Taylor MD, Carvey P, Ling Z, Trono D, Hantraye P, Deglon N, Aebischer P. Neurodegeneration Prevented by lentiviral vector delivery of GDNF in primate models of Parkinson's disease. *Science* 2000; 290(5492):767-73.
8. Palfi S, Leventhal L, Goetz C, Hantraye P, **Roitberg B**, Sramek JG, Emborg ME, Kordower JH. Delayed onset of abnormal movements following subacute 3-nitropropionic acid treatment in Cebus apella monkeys. *Movement Disorders* 2000; 15(3): 524-530.
9. **Roitberg B**, Cochran EJ, Thornton J, Charbel FT. Giant anterior communicating artery aneurysm infiltrated with a primary cerebral lymphoma. *Neurosurgery* 2000; 47(2):458-62.
10. Emborg-Knott ME, Shin P, **Roitberg B**, Sramek JG, Chu Y, Hamilton JS, Steiner JP, Kordower JH. Systemic administration of the Immunophilin ligand GPI 1046 in MPTP treated monkeys. *Experimental Neurology* 2001; 168:171-182.
11. **Roitberg B**, Khan N, Alp MS, Hersonskey T, Charbel FT, Ausman JI. Bedside ventriculostomy in the Neurosurgical ICU for the treatment of acute hydrocephalus. *British Journal of Neurosurgery* 2001;15(4):324-27.
12. Jobe TH, Helgason CM, Kim A, **Roitberg B**. "Show me the numbers": The application of numbers to medical science. *Surg Neurol* 2001;56: 3-7.
13. Corsten L, Raja A, Guppy K, **Roitberg B**, Misra M, Alp MS, Charbel F, Debrun G, Ausman J. Contemporary management of subarachnoid hemorrhage and vasospasm: the UIC experience. *Surg Neurol* 2001; 56:140-50.
14. Alperin N, Kulkarni K, Loth F, **Roitberg B**, Foroohar M, Mafee MF, Lichtor T: Analysis of MRI-based blood and CSF flow measurement in patients with Chiari I malformations: A system approach. *Neurosurgical Focus* July 2001;11:1(E6) .
15. **Roitberg B**, Sramek JG, Palfi S, Emborg ME, Kordower JH. Behavioral and morphological comparison of two nonhuman primate models of Huntington's disease. *Neurosurgery* 2002; 50(1): 137-146.
16. **Roitberg B**. Peripheral nerve surgery: What can be done? (Review) *Chicago Medicine* Spring 2002; 105:34-39.
17. **Roitberg B**, Tuccar E, Alp MS: Bilateral paramedian thalamic infarct in the presence of an unpaired thalamic perforating artery. *Acta Neurochir* 2002 Mar; 144:301-304.
18. **Roitberg B**, Khan N, Tuccar E, Kompoliti K, Chu Y, Alperin N, Kordower JH, Emborg ME. Chronic ischemic stroke model in cynomolgus monkeys: behavioral, neuroimaging and anatomical study. *Neurological Research* 2003 Jan;25(1):68-78.
19. **Roitberg B**. Transplantation for stroke. *Neurol Res.* 2004 Apr;26(3):256-64.

20. Misra M, **Roitberg B**, Ebersole K, Charbel FT. Intensive thromboprophylaxis and surveillance protocol prevents deep venous thrombosis and pulmonary embolism in a Neurosurgical Intensive Care Unit. *Neurosurgery* 2004 May; 54(5):1099-102; discussion 1102-3.
21. **Roitberg B**, Urbaniak K, Emborg ME: Cell transplantation for Parkinson's disease. . *Neurol Res* 2004 Jun;26: 355-62.
22. **Roitberg B**, Emechebe-Kennedy O, Amin-Hanjani S, Mucksavage J, Tesoro, E. Human recombinant factor VII for emergency reversal of coagulopathy in neurosurgical patients – a retrospective comparative study. *Neurosurgery* 2005 Nov;57(5):832-836
23. Alperin N, Lee SH, Mazda M, Hushek SG, **Roitberg B**, Goddwin J, Lichtor T. Evidence for the importance of extracranial venous flow in patients with idiopathic intracranial hypertension (IIH). *Acta Neurochir Suppl.* 2005;95:129-32.
24. Tambur AR, **Roitberg B**. Immunology of the Central Nervous System. *Neurological Research* 2005 Oct;27(7):675-8.
25. **Roitberg B.Z.**, Mangubat E., Chen E.-Y., Sugaya K., Thulborn K.R., Kordower J.H., Pawar A., Konecny T., Emborg M.E. Survival and early differentiation of human neural stem cells transplanted in a non human primate model of stroke. *Journal of Neurosurgery* 2006 July; 105:96-102.
26. Emborg ME, Carbon M, Holden JE, Ma Y, Tang C, During MJ, Jeff Moirano J, **Roitberg B**, Tuccar E, Roberts A, Kaplitt MG, Eidelberg D, MD. Subthalamic GAD Gene Therapy: Changes in Motor Function and Cortical Glucose Metabolism. *J Cereb Blood Flow Metab* 2006 Jul 12; 2007 Mar;27(3):501-9. Epub 2006 Jul 12.
27. Moirano J, Schafernak K, Moirano M, Evans M, Konecni T, **Roitberg B**, Pawar A, Mangubat E, Ma Y, Eidelberg D, Holden J, Kordower J, Leestma J. Basal ganglia lesions after MPTP administration in Rhesus monkeys. *Neurobiol Dis.* 2006 Aug;23(2):281-9.
28. Urbaniak K, Merchant A, Amin-Hanjani S, **Roitberg B**. Cardiac dysfunction following aneurysmal subarachnoid hemorrhage. *Surg Neurol.* 2007 Jan;67(1):21-8; discussion 28-9.
29. Alaraj A, Valyi-Nagy T, **Roitberg B**. Double Phakomatosis; Neurofibromatosis type -1 and Tuberous Sclerosis: Case report and review of literature. *Acta Neurochirurgica (Wien).* 2007;149(5):505-9; discussion 509
30. **Roitberg B**, Hardman J, Urbaniak K, Merchant A, Mangubat EZ, Alaraj A, Mucksavage J, Tesoro, Mlinarevich N, Watson KS, Shin JH, Chan M: Prospective Randomized Comparison of Safety and Efficacy of Nicardipine and Nitroprusside Drip for Control of Hypertension on the Neurosurgical ICU. *Neurosurgery.* 2008 Jul;63(1):115-20; discussion 120-1.
31. Mangubat E, Ruland S, **Roitberg B**, MD: Hydrocephalus in Posterior Fossa Lesions – Ventriculostomy and Permanent Shunt Rate by Diagnosis. *Neurol Res.* 2009 Sep; 31(7):668-73
32. Emborg ME, Ebert AD, Moirano J, Peng S, Suzuki M, Capowski E, Joers V, **Roitberg BZ**, Aebischer P, and Svendsen CN. GDNF-Secreting Human Neural Progenitor Cells Increase Tyrosine Hydroxylase and VMAT2 Expression in MPTP-Treated Cynomolgus Monkeys. *Cell Transplantation*, Vol. 17, pp. 383–395, 2008
33. Chan M, Alaraj A; Calderon M; Herrera S; **Roitberg B**: Predictors of Ventriculoperitoneal Shunt Requirement in Subarachnoid Hemorrhage Patients. *J Neurosurg.* 2009 Jan;110(1):44-9.
34. Emborg ME, Moirano J, Raschke J, Bondarenko V, Zufferey R, Peng S, Ebert AD, Joers V, **Roitberg B**, Holden JE, Koprach J, Lipton J, Kordower JH, Aebischer P.

- Response of aged parkinsonian monkeys to in vivo gene transfer of GDNF. *Neurobiol Dis.* 2009 Nov;36(2):303-11.
35. Hardman J, Graf O, Kouloumberis P, **Roitberg B**: Clinical and functional outcome of laminoplasty and laminectomy *Neurol Res* 2010 May;32(4):416-20
 36. Banerjee PP, Luciano CJ, Bellotte B, Lemole MGJR, Oh M, Charbel FT, **Roitberg B**. Learning retention of thoracic pedicle screw placement using a head- and hand-tracked high-resolution virtual reality simulator with haptic feedback. *Neurosurgery* 2011 Sep;69 Suppl Operative:ons14-9
 37. Esposito DP, Goldenberg FD, Frank JI, Ardelt AA, **Roitberg BZ**. Permanent cerebrospinal fluid diversion in subarachnoid hemorrhage: Influence of physician practice style. *Surg Neurol Int.* 2011;2:117.
 38. Babu MA, Coumans JV, Carter BS, Taylor WR, Kasper EM, **Roitberg BZ**, Krauss WE, Chen CC. A review of lumbar spinal instrumentation: evidence and controversy. *J Neurol Neurosurg Psychiatry.* 2011 Sep;82(9):948-51. Epub 2011 May 20.
 39. Shakur S, Lukas R, Takagi I, Chmura S, Gajewski T, **Roitberg B**. Ocular melanoma metastasis to the cervical spine. *Journal of Clinical Neuroscience* Jan 2012. 19(4):610-1.
 40. Hobbs J, Bina R, Dohrmann G, **Roitberg B**, – What's New in Spine Surgery. *Medical Principles and Practice* 2013;22(2):101-2.
 41. Alaraj A, Charbel FT, Birk D, Tobin M, Luciano C, Banerjee PP, Rizzi S, Sorenson J, Foley K, Slavin K, **Roitberg B**. Role of cranial and spinal virtual and augmented reality simulation using immersive touch modules in neurosurgical training. *Neurosurgery.* 2013 Jan; 72 Suppl 1:A115-23.
 42. **Roitberg B**. Tyranny of Randomized Controlled Trials. *Surgical Neurology International* Jan 2012;3:154
 43. Luciano C, Banerjee P, Sorenson JM, Foley KT, Ansari S, Rizzi S, Germanwalla A, Kranzler L, Chittiboina P, **Roitberg B**. Percutaneous spinal fixation simulation using virtual reality and haptics. *Neurosurgery.* 2013 Jan; 72 Supplement 1, A89–A96.
 44. Patel A, Luciano C, Holbrook TJ, Rizzi S, Kania P, Desai SK, Branch D, Smith AM, Banerjee PP, **Roitberg BZ**, Gasco-Tamarit J. A novel virtual reality simulation for hemostasis in a brain surgical cavity: perceived utility for visuomotor skills in current and aspiring neurosurgery residents. *Neurosurgery.* 2013 Aug;60 Suppl 1:182
 45. **Roitberg BZ**, Thaci B, Auffinger B, Kaplan L, Shen J, Brown FD, Lam S. Comparison between patient and surgeon perception of degenerative spine disease outcomes--a prospective blinded database study. *Acta Neurochir (Wien).* 2013 May;155(5):757-64
 46. Auffinger B, Lam S, Kraninger J, Shen J, **Roitberg BZ**. The impact of obesity on surgeon ratings and patient-reported outcome measures after degenerative cervical spine disease surgery. *World Neurosurg.* 2013 Oct 18. pii: S1878-8750(13)01369-7
 47. Auffinger B, Lam S, Shen J, Thaci B, **Roitberg BZ**. Usefulness of minimum clinically important difference for assessing patients with subaxial degenerative cervical spine disease: statistical versus substantial clinical benefit. *Acta Neurochir (Wien).* 2013 Dec;155(12):2345-55
 48. Gasco J, Patel A, Luciano C, Holbrook T, Ortega-Barnett J, Kuo YF, Rizzi S, Kania P, Banerjee P, **Roitberg BZ**. A Novel Virtual Reality Simulation for Hemostasis in a Brain Surgical Cavity: Perceived Utility for Visuomotor Skills in Current and Aspiring Neurosurgery Residents. *World Neurosurg.* 2013 Sep 25. pii: S1878-8750(13)

49. Schirmer CM, Elder JB, **Roitberg B**, Lobel DA. Virtual reality-based simulation training for ventriculostomy: an evidence-based approach. *Neurosurgery*. 2013 Oct;73 Suppl 1:66-73.
50. **Roitberg B**, Banerjee P, Luciano C, Matulyauskas M, Rizzi S, Kania P, Gasco J. Sensory and motor skill testing in neurosurgery applicants: a pilot study using a virtual reality haptic neurosurgical simulator. *Neurosurgery*. 2013 Oct;73 Suppl 1:116-21.
51. Auffinger B, Lam S, Shen J, **Roitberg BZ**. Measuring Surgical Outcomes in Subaxial Degenerative Cervical Spine Disease Patients: Minimum Clinically Important Difference as a Tool for Determining Meaningful Clinical Improvement. *Neurosurgery*. 2014 Feb;74(2):206-14.
52. Gasco J, Patel A, Ortega-Barnett J, Branch D, Desai S, Kuo YF, Luciano C, Rizzi S, Kania P, Matulyauskas M, Banerjee P, **Roitberg BZ**. Virtual reality spine surgery simulation: an empirical study of its usefulness. *Neurol Res*. 2014 Nov;36(11):968-73.
53. Lobel DA, Schirmer CM, Elder JB, **Roitberg B**. In reply: simulating ventriculostomy. *Neurosurgery*. 2014 Apr;74(4):E458-9
54. Auffinger B, Lam S, Shen J, **Roitberg BZ**. Measuring surgical outcomes in subaxial degenerative cervical spine disease patients: minimum clinically important difference as a tool for determining meaningful clinical improvement. *Neurosurgery*. 2014 Feb;74(2):206-13; discussion 213-4.
55. Auffinger B, Lam S, Kraninger J, Shen J, **Roitberg BZ**. The impact of obesity on surgeon ratings and patient-reported outcome measures after degenerative cervical spine disease surgery. *World Neurosurg*. 2014 Jul-Aug;82(1-2):e345-52.
56. Gasco J, Patel A, Ortega-Barnett J, Branch D, Desai S, Kuo YF, Luciano C, Rizzi S, Kania P, Matulyauskas M, Banerjee P, **Roitberg BZ**. Virtual reality spine surgery simulation: an empirical study of its usefulness. *Neurol Res*. 2014 Nov;36(11):968-73.
57. Alaraj A, Luciano CJ, Bailey DP, Elsenousi A, **Roitberg BZ**, Bernardo A, Banerjee PP, Charbel FT. Virtual reality cerebral aneurysm clipping simulation with real-time haptic feedback. *Neurosurgery*. 2015 Mar;11 Suppl 2:52-8.
58. **Roitberg B**, Kania P, Luciano C, Naga Dharmavaram N, Banerjee P. Evaluation of Sensory and Motor Skills in Neurosurgery Applicants Using a Virtual Reality Neurosurgical Simulator - The Sensory-Motor Quotient. *Journal of Surgical Education, J Surg Educ*. 2015 Nov-Dec;72(6):1165-71
59. Shakur SF, Luciano CJ, Kania P, **Roitberg BZ**, Banerjee PP, Slavin KV, Sorenson J, Charbel FT, Alaraj A. Usefulness of a Virtual Reality Percutaneous Trigeminal Rhizotomy Simulator in Neurosurgical Training. *Neurosurgery*. 2015 Sep;11 Suppl 3:420-5.
60. Troyk PR, Frim D, **Roitberg B**, Towle VL, Takahashi K, Suh S, Bak M, Bredeson S, Hu Z. Implantation and testing of WFMA stimulators in macaque. *Conf Proc IEEE Eng Med Biol Soc*. 2016 Aug;2016: 4499-4502.
61. Stamates A, Cui M, **Roitberg B**. "Clinical Outcomes of Cervical Laminoplasty: Results at Two Years". *Neurosurgery*. 2017 Jun 1;80(6):934-941
62. Mojumder D, Choi J, **Roitberg B**. Post-operative unilateral internuclear ophthalmoplegia following basilar pneumocephalus after resection of C1 intradural extramedullary tumor. *Clinical Neurology and Neurosurgery* 2017, *Clin Neurol Neurosurg*. 2017 Aug;159: 70-71

(b) Other original articles and editorials

1. Ausman JI, **Roitberg B**. A response from the ISUIA. (Editorial). *Surg Neurol* 1999 52:428-30.
2. Ausman JI, **Roitberg B**. Field of the future – Neurogenic disease. 2000 Mar;53(3):290-2.
3. Ausman JI, **Roitberg B**. A visit to Hungary: a solemn occasion. (Editorial) *Surg Neurol* 2000; 54:471- 3.
4. **Roitberg B**, Ausman JI: Of mice and men: How we developed big brains. *Surg Neurol* 2002 Nov; 58 (5): 293-294.
5. **Roitberg B**. Complexity strikes again - Surprising findings in mouse models of demyelinating disease. *Surg Neurol* 2002 Dec; 58 (6): 358-358.
6. **Roitberg B**, Ausman JI. Many patients with stroke are never seen by neurosurgeons. *Surg Neurol* 2002 Mar; 57(3):145-6.
- 7-112. **Roitberg, B, Monthly column “Research News and Notes”**, in the journal *Surgical Neurology*, written from 2002-2009; **104** editorial columns total.

(c) Book chapters:

1. **Roitberg B**, Sramek JG, Shin P, Kordower JH. Transplantation for neurodegenerative diseases, in “CNS diseases: innovative animal models”. Emerich DF, Dean R, Sanberg PR ed’s. Humana Press, NJ. 1999. Pp.441-483.
2. **Roitberg B**, Kordower JH. Brain implants and transplants. In: Encyclopedia of the Social and Behavioral Sciences, Ed’s Smelser NJ, Baltus PB, Pergamon/Elsevier 2001.
3. **Roitberg B**. Injury to the median nerve above the elbow. Book chapter, *Surgery of Peripheral Nerves*. Editors: Rajiv Midha, Eric Zager. Thieme 2008; pp 86-90.
4. **Roitberg B**, Back A. Cervical Laminoplasty. Chapter in WFNS Spine committee textbook “Surgical management of cervical disc herniation.” P. Ramani et al. Editors. Jaypee Medical Publishers, New Delhi, 2012.
5. **Roitberg B**, Cui M, Javed Khader Eliyas J. Annular repair in lumbar discectomy Chapter in WFNS Spine Committee textbook “Surgical management of lumbar disc herniation”. P. Ramani et al Editors. Jaypee Medical Publishers Summer 2013.
6. **Roitberg B**, Hobbs J. image guided thoracic pedicle screw placement. WFNS Spine Committee textbook. P Ramani et al, editors. Jaypee Medical Publishers 2015.

(d) Peer-reviewed works in other outlets and other publications:

1. MD Thesis: The effect of pre-natal regular stress in the last week of pregnancy on anxiety levels and laterality in adult rats; accepted October 1989. (Supervisor: Prof M. Weinstock-Rosin)
2. Mangubat E, **Roitberg B**. Current management of cerebral vasospasm. World Federation of Neurosurgical Societies website, 2005.
3. Alaraj A, **Roitberg B**. Intracranial Venous Sinus Thrombosis Management. World Federation of Neurosurgical Societies website, 2005.
4. Alaraj A, **Roitberg B**. Critical care management of extracranial carotid dissections. World Federation of Neurosurgical Societies Website, 2006.
5. **B Roitberg**. Early decompressive surgery in malignant infarction of the middle cerebral artery The University of Chicago Journal Club, August 2010 (Journal club of the University of Chicago, is a peer reviewed feature of *Surgical Neurology International*, an Online-only journal).
6. **B Roitberg**. Coiling Aneurysms. The University of Chicago Journal Club, October 2010. *Surgical neurology International*.
7. **B Roitberg**. Deep Brain Stimulation for Parkinson’s Disease. The University of Chicago Journal Club, March 2011, *Surgical Neurology International*.
8. **B Roitberg**. SPORT and related studies of Spine Surgery Outcomes. The University of Chicago Journal Club, June 2011, *Surgical Neurology International*.

9. **B Roitberg** Stereotactic and functional neurosurgery. The University of Chicago Journal Club of October 26. Surgical Neurology International.
10. **B Roitberg** Trends in spine surgery. The University of Chicago Journal Club March 2012. Surgical Neurology International.
11. **B Roitberg** Biases in randomized controlled trials. The University of Chicago Journal club June 2012. Surgical Neurology International.

(e) Other works that are publically available (websites, interviews, publications in the popular press, testimony, computer programs, protocols, reagents, inventions, patents not listed above, etc.)

2005 - **Co-Inventor**, Pleated Stent Assembly, **patent** **2005/0090888**
 With Electroform Stents, Inc.
 2012 – Co-owner, patent for Electroforming stents. **6,019,784**.

Peer reviewed abstracts at professional society meetings:

1. **Roitberg B**, Sramek JG, Palfi S, Anderson C, Emborg ME, Kordower JH. Primate Models of Huntington's Disease (HD): analysis of cognitive and motor deficits induced by 3-nitropropionic acid (3-NP) and quinolinic acid(QA). Society for Neuroscience meeting, Los Angeles CA, Nov 1998.
2. Kordower JH, Emborg ME, Shin P, **Roitberg B**, Sramek J, Chu Y-P, Hamilton GS, Suzdak PD, Steiner JP: Systemic administration of the immunophilin ligand GPI 1046 in MPTP treated monkeys. Society for Neuroscience meeting Los Angeles CA, Nov 1999.
3. Alperin NJ, Loth F, Lee SH, Charbel FT, Lichtor T, **Roitberg B**. MRI imaging based noninvasive method for intracranial pressure measurement. Oral Presentation - Radiological Society of North America, Nov 26-Dec 3, 1999. Chicago, IL.
4. Kordower JH, Bloch J, Shuang M, Palfi S, **Roitberg B**, Emborg ME, Abischer P. Lentivirus gene transfection in the nonhuman primate brain. American Society for Neural transplantation and regeneration meeting, Clearwater, FL, May 1999.
5. Emborg ME, Bloch J, Ma SY, Chu YP, Palfi S, **Roitberg B**, Stansell J, Hantraye P, Deglon N, Aebischer P, Kordower JH. Lentiviral vector gene transfer to the nonhuman primate nigrostriatal system. Society for Neuroscience, Miami FL, Oct 1999.
6. Emborg ME, Bloch J, Ma S, Chu YP, Leventhal L, Palfi S, **Roitberg B**, Stansell J, Hantraye P, Deglon N, Holden J, Brown D, Taylor M, Aebischer P, Kordower JH. Lentiviral delivery of GDNF in aged rhesus monkeys. Abstract, 6th National Parkinson Foundation International Symposium 1999.
7. **Roitberg B**, Palfi S, Sramek JG, Emborg ME, Kordower JH, Ausman JI. Primate models of Huntington's disease: Histological changes, cognitive and motor deficits induced by 3- nitropropionic acid and quinolinic acid. Oral-poster presentation, Congress of Neurological Surgeons meeting, Boston MA, Oct 1999.
8. **Roitberg B**, Cochran EJ, Thornton J, Charbel FT. Giant Anterior Communicating Artery Aneurysm Infiltrated with a Primary Cerebral Lymphoma. CNS meeting, San Antonio, Texas Sep 2000.
9. **Roitberg B**, Khan N, Alp MS, Hersonskey T, Charbel FT, Ausman JI. Bedside ventriculostomy in the neurosurgical ICU for the treatment of acute hydrocephalus. Congress of Neurological Surgeons meeting, Oral-poster presentation, San Antonio TX, Sep 2000.
10. **Roitberg B**, Emborg ME, Khan N, Alperin N, Kordower JH, Ausman JI. MCA occlusion in Cynomologous macaques results in impaired motor planning with the ipsilateral

- extremity. Oral-poster presentation. Congress of Neurological Surgeons meeting, San Antonio, TX, Sep 2000.
11. Emborg ME, Bloch J, Chu YP, Palfi S, **Roitberg B**, Holden JE, Brown D, Taylor M, Hantraye P, Deglon N, Aebischer P, Kordower JHL. Lentiviral delivery of GDNF in aged rhesus monkeys. FENS (Federation of European Neuroscience Societies) June 24-28, 2000, Brighton, United Kingdom.
 12. **Roitberg B**, Emborg ME, Khan N, Alperin N, Kordower JH, Ausman JI. Behavioral and MRI analysis of deficits induced by MCA occlusion in the non-human primate. Poster presentation, AANS 2000 annual meeting. San Francisco, CA, April 8-13, 2000.
 13. Carneiro C, **Roitberg B**, Barshes N, Charbel FT. Ischemic cardiac complications of subarachnoid hemorrhage. Poster presentation at AANS annual meeting April 22-26, 2001 Toronto, Ontario, Canada.
 14. Alperin, N, Lee S, Loth F, **Roitberg B**, Raksin P, Charbel F. MRI-based Noninvasive Method for Measurements of Intracranial Compliance and Pressure. Oral presentation, AANS meeting, Toronto, Canada, April 22-26, 2001.
 15. Alp MS, **Roitberg BZ**, Slavin, KV, Engelhard HH, Ausman JI. Image-guided surgery for metastatic brain tumors. Poster presentation CNS meeting, San Diego, CA, Sept 29 – Oct 4, 2001.
 16. **Roitberg B**, Tuccar E, Alp MS: Bilateral paramedian thalamic infarct in the presence of an unpaired thalamic perforating artery. Poster presentation AANS meeting, Chicago April 2002.
 17. **Roitberg B**, Terry Lichtor MD PhD, Francis Loth PhD, Noam Alperin, PhD. Evidence of the importance of extracranial venous flow in patients with idiopathic intracranial hypertension. Poster presentation, AANS meeting, Chicago April 2002.
 18. **Roitberg B**, Fino J: Intraoperative Somatosensory Evoked Potentials Predicted Early Recovery of Tibial Nerve Function. Poster presentation at the AANS/CNS Joint section for Spine and Peripheral Nerve meeting, Orlando, Florida, Feb 27 – Mar 2, 2002.
 19. Emborg ME, **Roitberg BZ**, Khan N, Tuccar E, Chu Y, Kordower JH, Alperin N: Long-term magnetic resonance spectroscopy changes in a nonhuman primate model of stroke. Presented INTR-8 meeting, June 12-16 2002, Keystone, Colorado.
 20. **Roitberg B**, Mangubat E, Emborg ME. Transplantation of human neural stem cells in a non-human primate model of stroke. Oral Presentation, ASNTR meeting, Clearwater, Florida, May 6-9, 2004.
 21. **Roitberg B**, Gatto R, Hersonskey T. Sterile inflammatory cyst after repair of a craniectomy defect with Norian cranial repair system. Presented CNS 54th annual meeting, San Francisco, CA, October 16-21, 2004.
 22. **Roitberg B**, Urbaniak K, Merchant A, Charbel FT. Cardiac changes in Aneurysmal subarachnoid hemorrhage. Accepted for CNS 54th annual meeting, San Francisco, CA, October 16-21, 2004.
 23. **Roitberg B**, Kennedy O, Amin-Hanjani S. Human Recombinant Factor VII for emergency reversal of coagulopathy in neurosurgical patients. Oral Presentation, CNS 54th annual meeting, San Francisco, CA, October 16-21, 2004.
 24. Moirano J, Zufferey R, Peng S, Ebert A, Joers V, Breburda E, **Roitberg B**, Holden J, Koprach J, Lipton J, Kordower JH, Aebischer P, Emborg ME. Lentiviral delivery of GDNF in aged MPTP-treated Rhesus monkeys: correlations between functional measures. ASNTR, May 2006
 25. Ruland SD, Cursio J, Mezo I, Mezo VF, **Roitberg B**. Transfusion after Aneurysmal Subarachnoid Hemorrhage. AANS annual meeting April 2006, San Francisco.

26. Ebert AD, Moirano J, Peng S, Breburda E, Suzuki M, Capowski E, Joers V, **Roitberg B**, Aebischer P, Svendsen CN, Emborg ME. Survival of human neural progenitor cells (hPSCs) expressing GDNF in MPTP-treated rhesus monkeys. ASNTR 2006.
27. Emborg ME, **Roitberg B**, Moirano J, Zufferey R, Ebert AD, Joers V, Holden J, Converse AK, Koprach JB, Kordower JH, Aebischer P, Lentiviral delivery of GDNF on aged MPTP-treated Rhesus monkeys. Oral presentation (Open paper) CNS meeting. October 2006, Chicago.
28. **Roitberg B**, Merchant A, Urbaniak K: Prospective randomized comparison of safety and efficacy of nicardipine and nitroprusside drip for control of hypertension in the neurosurgical ICU. Select abstract. CNS meeting October 2006, Chicago.
29. **Roitberg B**, Mangubat E, Ruland S: Hydrocephalus in posterior fossa lesions – incidence and shunt rate by diagnosis. CNS meeting, October 2006, Chicago.
30. Hardman J, Graf O, Kouloumberis P, **Roitberg B**: Clinical outcomes of cervical laminoplasty – Karnofsky and Nurick scores and predictors of outcome. CNS meeting, October 2006, Chicago.
31. Hardman J, Graf O, Kouloumberis P, **Roitberg B**: Clinical Outcomes of Cervical Laminoplasty Versus Cervical Laminectomy: AANS meeting, April 2007, Washington DC.
32. Colpan ME, Slavin KV, **Roitberg B**: STN and Red Nucleus Volumes in Parkinson's Patients - Do They Change with Disease Progression? AANS meeting, April 2007, Washington DC.
33. Chan M, Alaraj A, Herrera SR, Calderon M, Colpan ME, Ruland S, **Roitberg B**: Predictors of Ventriculo-peritoneal Shunt Requirement in Subarachnoid Hemorrhage Patients with External Ventricular Drain. *Oral presentation*, AANS meeting, April 2007, Washington DC.
34. **Roitberg B**, Hardman J, Urbaniak K, Merchant A, Mangubat E, Alaraj A, Mucksavage J, Tesoro E, Mlinarevich N, Watson K, Shin J, Chan M. Comparison of intravenous nicardipine and nitroprusside for control of hypertension in the neurosurgical ICU: A prospective randomized study of safety efficacy and cost. Select Poster - CNS annual meeting, San Diego, Sept 2007.
35. Chan M, Alaraj A, Rubin M, Calderon M, Herrera S, **Roitberg B**. Risk of aneurysm rerupture after placement of external ventricular drain in a population of patients with aneurysmal subarachnoid hemorrhage. CNS annual meeting, San Diego, Sept 2007.
36. **Roitberg B**, Gao W, Julian Hardman J, Oliver Graf O. Better Early Functional Recovery after Cervical Laminoplasty Compared with Laminectomy. AANS/CNS Joint Section for Spine and Peripheral Nerves, 2008 annual meeting, Orlando, FL.
37. James L. Stone, Ben Z. **Roitberg**, Mateo Calderone-Arnulphi, Sebastian Herrera, Troy Munson, Obina Emechebe-Kennedy, Venketesh Aiyagari, Sean Ruland, A Non-Invasive Intracranial Pressure Monitor Utilizing Modified Brainstem Auditory Responses. Poster, AANS meeting May 2009.
38. Stone JA, **Roitberg BZ**, Charbel F, Fino J. Bedside Brain Compliance monitoring with Brainstem Auditory Evoked Responses. Oral Presentation at the WFNS meeting, Boston Sept 2009
39. James L. Stone, Ben Z. **Roitberg**, Fady Charbel, John Fino, Bedside Brain Compliance Monitoring with Brainstem Auditory Evoked Responses, CNS meeting 2009
40. **Roitberg B**, Esposito D Can we predict who will become shunt dependent? Oral presentation and discussion, Rachidian Society meeting, Mauna Lani Jan 2010.

41. Banerjee PP, Luciano C, Bellotte B, Lemole M, Oh, M, Charbel F, **Roitberg B**; Accuracy of Thoracic Pedicle Screw Placement using a Virtual Reality Simulator with Haptic Feedback. Oral presentation, Rachidian Society meeting, Mauna Lani Jan 2010
42. Shakur S, Takagi I, Lukas RV, Chmura S, **Roitberg B**. Ocular melanoma metastasis to the cervical spine. Poster, AANS/CNS Joint Section on Spine and Peripheral Nerve annual meeting, Orlando Feb 2010.
43. Banerjee PP, **Roitberg B**, Luciano C, Bellotte JB Lemole JM, Oh M, Charbel FT. Accuracy of Thoracic Pedicle Screw Placement using a Head- and Hand-Tracked High-Resolution Virtual Reality Simulator with Haptic Feedback. AANS Meeting Philadelphia May 2010.
44. **Roitberg B**, Esposito D. Can we predict who will become shunt-dependent? E-poster, AANS Meeting Philadelphia May 2010.
45. Domenic Esposito II; **Ben Z. Roitberg**. There Are Objective Factors that Correlate with the Outcome of Initial Ventriculostomy Challenge in Patients with Hydrocephalus after Subarachnoid Hemorrhage. E-poster, CNS annual meeting, San Francisco, Oct 2010.
46. **Roitberg B**, Kaplan L. Factors That Influence Prospective Outcome Database Follow-Up Rates. E-poster AANS Annual meeting, Denver, April 2011.
47. Kaplan L, Liu F, shen J, **Roitberg B**. Comparison Between Patient and Surgeon Perceptions of Spine Neurosurgical Outcomes - A Prospective Blinded Database Study. Neurosurgical Forum, CNS, Washington DC, October 2011.
48. Demetropoulos, CK, Kiapur AM, Svach, DJ, Chow D, Evanson, BJ, **Roitberg BZ**, Elgafy H, Goel VK. "Biomechanics of an Allograft Threaded Facet Dowel: Evaluation by a Multi-Axis and Multi-Parameter Test Strategy" AANS annual meeting, electronic poster presentation. 2012 Miami from 4/12-4/18.
49. **Roitberg B**, Luciano C, Rizzi S, Banerjee P: Participant Satisfaction with Simulation of Minimally Invasive Spine Surgery Using Virtual Reality and Haptics. Abstract at the AANS/CNS section of spine and peripheral nerve surgery; Orlando Florida March 2012.
50. **Roitberg B**, Stamates M. Stable Anteroposterior Diameter of the Spinal Canal on Follow-up CT Scans After Open Door Laminoplasty Abstract at the AANS/CNS section of spine and peripheral nerve surgery; Orlando Florida March 2012.
51. **Roitberg B**, Comparison between Patient and Surgeon Perception of Outcomes of Operations for Degenerative Spine Disease: a Prospective Blinded Database Study. Oral Presentation – CNS 2012, Chicago
52. **Roitberg B**, Comparison of cervical and lumbar spine degenerative disease outcomes – A prospective spine surgery outcome database study with SF-36. Poster – CNS 2012, Chicago.
53. Auffinger BM; Lam S, Thaci B; Shen; **Roitberg B**. Measuring surgical outcomes in subaxial degenerative cervical spine disease patients: minimum clinically important difference as a tool for determining meaningful clinical improvement. Oral – Poster presentation at AANS/CNS Spine section meeting, Phoenix AZ, March 6-9 2013.
54. Auffinger BM; Lam S; Kraninger J; Shen J; **Roitberg B**. The Impact of Obesity on Patient-reported Outcome Measures after Degenerative Cervical Spine Disease. Oral – Poster presentation at AANS/CNS Spine section meeting, Phoenix AZ, March 6-9 2013.
55. Auffinger BM; Lam S, Shen; Thaci B, **Roitberg B**. Using Surgeon's Rating as an Anchor for Minimally Clinically Important Difference in Subaxial Cervical Spine Surgery Outcome. Poster presentation at AANS/CNS Spine section meeting, Phoenix AZ, March 6-9 2013.

56. **Roitberg B**, Stamates M, Cui M. Stable anterior-posterior diameter of the spinal canal on follow up CT scans after open door laminoplasty. Poster presentation at AANS/CNS Spine section meeting, Phoenix AZ, March 6-9 2013.
57. **Roitberg B**, Khader-Eliyas J, Pytel P. Juxta Articular Myxoma Arising from a Lumbar Facet Joint. E-poster; WFNS meeting; Seoul September 7-13, 2013.
58. Gasco J , Koshi N, Ortega-Barnett J, Holbrook T, Patel A, Luciano C, Rizzi S, Martin Matuyauskas M , Banerjee P, Kania, **Roitberg B**. Neurosurgery Specific Stereognosis Improvement with Haptic-based Computer Simulation Training. E-poster; WFNS meeting; Seoul September 7-13, 2013.
59. Gasco J, J Ortega-Barnett J, Patel A, Branch D, Luciano C, Rizzi S, Banerjee P, Kania P, Matuyauskas M, Holbrook T, **Roitberg B**. Effects of Pedicle Screw Placement and Targetting Computer-based Simulation in Technical Performance Observed in Physical Models: A Pilot Study. Oral Presentation. WFNS meeting; Seoul September 7-13, 2013.
60. Gasco J, Holbrook T, Patel A, Luciano C, Rizzi S, Kania P, Banerjee P, Branch D, Matuyauskas M, **Roitberg B**. Neurosurgery Hemostasis Training with Haptic-based Computerized Simulation: a Useful Adjuvant to Improving Visuomotor Skills in Current and Aspiring Neurosurgery Residents. Oral Presentation. WFNS meeting; Seoul September 7-13, 2013.
61. **Roitberg B**, Banerjee P, Luciano C, Rizzi S, Matuyauskas M, Kania P, Gasco J. Sensory and Motor Skill Testing in Neurosurgery Applicants – a Pilot Study Using a Virtual Reality Neurosurgical Simulator. Oral Presentation. WFNS meeting; Seoul September 7-13, 2013.
62. Stamates M, **Roitberg BZ**. Clinical outcome and anterior-posterior diameter of the spinal canal after open-door, autologous graft laminoplasty. AANS/CNS section on the disorders of the spine and peripheral nerve meeting, Orlando Florida, March 2014.
63. Bhansali A, Goldschmidt E, Hussain MS, **Roitberg BZ**. Age does not affect patients' perceived outcome of surgery for degenerative spine disease. Abstract, CNS meeting Boston Oct 2014.
64. Goldschmidt E, Hussain MS, Bhansali A, Shen JJ, **Roitberg BZ**. Patient perception of outcome and satisfaction with care correlate with loss to follow up in a prospective spine outcome registry. Abstract, CNS meeting, Boston 2014.
65. Goldschmidt E, Hussain MS, Shen JJ, Bhansali A, **Roitberg BZ**. Perception of outcome vs satisfaction with care in spinal degenerative disease. Correlation and variability with time. Abstract, CNS meeting, Boston 2014.
66. Hussain MS, Lam S, Auffinger B, Goldschmidt E, Bhansali A, Shen JJ, **Roitberg B**. The effect of patient characteristics on patient-reported outcomes (PROs) following cervical spine surgery. Abstract, CNS meeting, Boston 2014.
67. **Roitberg B**, Kania P, Luciano C, Banerjee P. Virtual reality simulator as a tool to evaluate sensory-motor skill in applicants to a neurosurgery residency program. Neurosurgical Forum, CNS meeting, Boston 2014.
68. Auffinger BM, Bhansali A, Shen JJ, **Roitberg B**; The influence of age on clinical features and surgical outcomes of degenerative cervical spine disease.2015.
69. Philip R. Troyk, David Frim, **Ben Roitberg**, V. Leo Towle, Sungjae Suh, Martin Bak, Sam Bredeson, Zhe Hu; Implantation and Testing of WFMA Stimulators in Macaque. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2016

(g) Recent clinical and educational trials

1. Prospective Blinded outcome registry of surgery for degenerative disease of the spine. From September 2009. Several clinical studies are ongoing or being written up based on this data.
2. Evaluation of outcome of facet fusion with threaded bone dowel allograft. Based on a new facet fusion method developed by Synthes with my consultation.
3. Testing of Sensory-motor skill in neurosurgery residency applicants; 2012 – present.
4. Evaluation of new modalities of virtual reality simulation in neurosurgery; 2009 – present.

(j) Works in review, in preparation, etc. not yet publically available

1. Chow D, Angert N, **Roitberg B**. "Biomechanics of an Allograft Threaded Facet Dowel: Evaluation by a Multi-Axis and Multi-Parameter Test Strategy"
2. Gasco J, Patel A, Ortega-Barnett J, Branch D, Kuo YF, Luciano C, Rizzi S, Kania P, Matuyauskas M, Banerjee P, **Roitberg B**. Computer-simulation training positively impacts the accuracy of pedicle screw placement performed by aspiring neurosurgery residents in sawbone models.
3. Koshy N, Holbrook T, Ortega-Barnett J, Kuo YF, Luciano C, Rizzi S, Kania P, Banerjee P, **Roitberg B**, Gasco J, Neurosurgical Tactile Discrimination Training with Haptic-based Virtual Reality Simulation.
6. Khader-Eliyas J, Pytel P, **Roitberg B**. Juxta Articular Myxoma arising from a lumbar facet joint.
7. Bhansali A, Auffinger B, **Roitberg B**: The effect of age on outcome of surgical treatment of degenerative disease in the cervical spine.
8. Khader-Eliyas J, **Roitberg B**; Lumbar spine mobility in a large sample of patients – variability by age and level based on analysis of routine flexion-extension radiographs.

FUNDING HISTORY

1. Spine Education and Research Fund – Established and managing to promote education and research at U Chicago neurosurgery. Private and corporate donations.(variable sums currently around \$60,000/year)
2. US Army grant W81XWH-12-1-0394, ongoing. "Preparation for the Implantation of an Intracortical Visual Prosthesis in a Human". Coinvestigator.
3. Phase II SBIR/NINDS award "Wireless Multichannel Electrooculogram Recording for Epilepsy Monitoring" Budget Periods: 5/1/2013 – 4/30/2015. Consultant.
4. NIH 2R44NS066557-02. Aneurysm clipping model in virtual reality. Coinvestigator. Project period 2012-2014.
5. "Transplantation of human neural stem cells in a non human primate model of stroke". – P.I.; CRB of the University of Illinois, Fall 2002. Funded 2003-2004.
6. "Safety and Efficacy of Nicardipine for Control of Blood Pressure after Subarachnoid Hemorrhage (SAH) – a prospective comparative trial". - P.I.; Grant - ESP Pharma. \$30,000. January 2004 – Dec 2006.
7. "DuraGen vs DuraGard in Chiari surgery" – Coinvestigator 2004-2008. Supported by Integra NeuroScience.
8. "Lentiviral delivery of GDNF and Bcl-2 in model of PD" – Coinvestigator. RO1 NS40578. 6/00-06/04 NIH, NINDS.
9. "Development of GDNF secreting human neural stem cells for the treatment of Parkinson's Disease." – Coinvestigator. Supported by Kinetics Foundation 08/05-08/08.
10. "Neural stem cell transplantation in a rat model of stroke" - P.I. Supported in part by Falk foundation (2005-2006)..
11. "Immune response to neural stem cells and immune characteristics of neural stem cells". Coinvestigator, project partially supported by the Falk foundation (2005-2006).
12. "Simvastatin for the prevention of vasospasm" - a placebo controlled randomized prospective study; coinvestigator. Unrestricted grant from Synthes 2006.

13. Spine educational grant, to create the scientific and educational environment for advanced training in spine neurosurgery simulation. Medtronic Inc, 2009-2010
14. Private grant – Neural regeneration in rodent models of spinal cord compression injury, using a neurotrophic agent (MS-818) or omental transposition.

INVITED SPEAKER/INSTRUCTOR

- 2001 “Peripheral Nerve Surgery” – Department of Neurology Grand Rounds. UIC
- 2001 “Peripheral Nerve Surgery” – Invited lecture at Norwegian American Hosp
- 2001 “Peripheral Nerve Surgery” – Invited lecture at St. Francis Hospital, Evanston
- 2001 “Peripheral Nerve Surgery” – Invited lecture at Oak Park Hospital, Oak Park
- 2001 “Peripheral Nerve Surgery” – Invited lecture at Little Company of Mary Hospital, Evergreen Park, IL.
- 2003 “Transplantation in the Central Nervous System” - Invited Plenary Speaker, American Society for Histocompatibility and Immunogenetics (ASHI), 29th annual meeting, October 28 – November 1, 2003, Miami, Florida
- 2003 “Peripheral nerve surgery – what can be done?” Invited lecture – Alexian Brothers Neuroscience
- 2004 “Transplantation in the CNS”. Invited speaker, Alexian Brothers Neurobehavioral Institute
- 2004 Teacher at the AANS oral board preparation course.
- 2006 “Brain tumors and some impostors” – Invited lectures, Alexian Brothers Medical Center, February and March 2006.
- 2006 “Transplantation in the CNS” – Invited Speaker, Indiana University, Indianapolis
- 2006 “Transplantation in the Brain” - Grand Rounds, Dept. of Neurology, UIC, Chicago IL, 9/21/2006.
- 2008 “NSICU Development and Research” – Invited speaker, University of Rochester Department of Neurosurgery, Rochester, NY, March 2008
- 2010 “Every Neuron Counts – ICU Development”. Invited Speaker, 10th annual Tiantan Stroke Conference, Beijing China
- 2010 “Getting published in the English language literature – comments from Neurological Research”. Invited speaker, 10th annual Tiantan Stroke Conference, Beijing China; June 2010
- 2010 Instructor at the Senior Society Neurosurgery “boot camp” for beginning residents. Central line and arterial line placement. Chicago
- 2011 “Manuscript preparation and the review process”. Invited speaker, 11th annual Tiantan Stroke Conference, Beijing China, June 2011.
- 2011 “Is rational management of ICP possible?” Invited speaker, 11th annual Tiantan Stroke Conference, Beijing China, June 2011.
- 2011 Instructor at the Senior Society Neurosurgery “boot camp” for beginning residents. Central line and arterial line placement. Chicago, July 2011.
- 2011 – Faculty, CNS annual meeting Surgical Simulation practical course, October 2011, Washington DC.
- 2012 – Faculty, Practical neurosurgery course, June 1-10 Chicago IL
- 2012 – Speaker and Director – Kliver Memorial symposium “Science at the Forefront of Spine Surgery”, Chicago IL June 6 2012.
- 2012 – Instructor at the Senior Society Neurosurgery “boot camp” for beginning residents. Central line and arterial line placement. Chicago, July 2012
- 2012 – Speaker, “Getting a clinical neuroscience article published” Neuropinamar conference, Pinamar Argentina November 28 2012.
- 2012 – Speaker: “Medical publishing – mysteries unveiled” Hospital Italiano Buenos Aires Argentina, November 2012.

2013 - Instructor at the Senior Society Neurosurgery “boot camp” for beginning residents. Lumbar drain placement. Chicago, July 2012

2013 – Instructor, WFNS Spine Committee course, Mumbai India, September 2013.

2013 – Speaker. The influence of obesity on the outcome of cervical spine surgery. WFNS Spine committee meeting and India Spine Neurosurgery Society meeting, Pune, India September 4-7, 2013.

2013 – Speaker. “How to publish in the medical literature” WFNS Spine committee meeting and India Spine Neurosurgery Society meeting, Pune, India September 4-7 2013.

2013 – Speaker, Black Sea Neurosurgical Conference, Tbilisi November 2013. Topics: Medical Publishing; Innovation in minimally invasive spine surgery.

2014 – Instructor, SNS bootcamp, July 2014

2014 – Speaker, “Outcomes of spine neurosurgery based on a prospective long term outcome registry”, WFNS Spine Committee meeting, Cartagena, Colombia, Sept 2014.

2014 – Speaker, “Medical publishing” - WFNS Spine Committee meeting, Cartagena Colombia 2014.

2014 – Instructor, “Minimally invasive lumbar discectomy”. WFNS practical course Mumbai India, September 2014.

2015 – Speaker, “Virtual reality for neurosurgical training, mission rehearsal and applicant selection” Hebrew University Hadassah Department of Neurosurgery, Jerusalem Israel. Feb 2015.

2015 – Instructor – virtual reality simulation pedicle screw placement. SNS Bootcamp2, Indianapolis April 17 2015.

2012 – 2015 – Faculty, the CNS Neurosurgical simulation course at the CNS meetings.

2016 – Speaker, WFNS Spine committee Meeting, Manila, Philippines, September 2016. Topics - Medical publishing; Use of virtual reality for resident education and training; Value based spine surgery and patient rated outcome analysis.

2017 – Speaker, AANS advances in spine technology course. “Virtual reality simulation for spine surgery”. April 22, 2017, Los Angeles.

2017 – Speaker, China National Stroke Conference. “ Building a neuro-ICU - emphasis on hemorrhagic stroke and aneurysmal SAH”. May 20, 2017. Beijing, China.

EXTRAMURAL SERVICE

2002– 2009 **Associate Editor**, “Surgical Neurology” (an international journal of neurosurgery, Elsevier Publishing)

2005- 2006 **Associate Editor/Critical Care Editor**, World Federation of Neurosurgical Societies website.

2009 **Secretary**, The Rachidian Society; a society for furthering research and treatment of spinal disorders in a multidisciplinary environment.

2010 Member, CSR National Registry of Volunteer Reviewers (NIH).

2011 – **Editor-in-Chief**, Neurological Research

2011 - 2014 – Associate Editor and Editor of Journal Club, Surgical Neurology International.

2013 – Reviewer for the WFNS 2013 meeting/spine presentations.

2013 – Guest examiner, American Board of Neurological Surgery Oral examinations, November 2013, Houston TX.

2014 – **Chair, subcommittee on publications**, World Federation of Neurosurgical Societies Spine Committee.

2015 – Chair, Advisory Board, ImmersiveTouch simulation.

PROFESSIONAL SOCIETIES

Elected or invited

Fellow of the AANS – FAANS

Member - Spine Committee of the World Federation of Neurosurgical Societies
Member – Congress of Neurological Surgeons Simulation Committee

Other:

American Association of Neurological Surgeons (AANS)
Congress of Neurological Surgeons (CNS)
AANS/CNS Section for Spine and Peripheral Nerve Surgery
AANS/CNS Section for Neurotrauma and Critical Care
American Medical Association (AMA)
Illinois State Medical Society (ISMS)
Chicago Neurological Society

EDUCATION

The University of Illinois (2000- 2008)

Lectures:

1996 “Introduction to Neurosurgery” – Medical students - UIC School of Medicine
1997 Course of Medical Neuroanatomy - Instructor- UIC School of Medicine
1997 “NF I, spinal cord tumor removal” - case presentation and panel discussion at the Neurofibromatosis Symposium, UIC.
1997 “Transplantation in the Central Nervous System” - Neurosurgery grand rounds, UIC
1997 “Transplantation in the Central Nervous System” - Medical students - UIC School of Medicine,.
2000 “Future of Neurosurgery: Neuroprotection and Neuroregeneration” Grand rounds. UIC Dept of Neurosurgery.
2002– 2008 Quarterly lectures on head trauma/spinal trauma to 3rd year medical students, UIC School of Medicine.
2003- 2008 “Neuroanatomy in clinical practice” – Annual lectures to medical students and allied health professions. UIC College of Medicine
2005 “Neurosurgical applications of stem cells” – Stem Cell Course Fall 2005. Organized by Department of Physiology and Biophysics.
2008 - “Cerebrovascular diseases and stroke” – Lecture for graduate students at the department of Anatomy and Cell Biology

UIC Medical School

Advised 14 medical students and 2 research fellows at UIC. Currently advising and doing research with 3 medical students at the University of Chicago.

UIC Neurosurgery Residency

"Science Breakfast" monthly conference, 2003-2008, with invited and local guest speakers (host), at UIC..

Regular teaching rounds, Journal club, techniques conferences at UIC, for residents.

The University of Chicago:

Pritzker School of Medicine (M.D.):

2008 – Regular reaching of medical students on neurosurgery rotations.
2011 – Mentor, Pritzker student through SRP
2012 – Mentor, three students through SRP

Graduate medical education (residency and clinical fellowships):

2008 – Regular teaching of residents, daily rounds, clinic supervision, teaching and supervision in the operating room, and supervision in-house and from home while on call.

2011 - **Neurosurgery Residency Program Director**

Research trainees:

2008-2009 Adam Back, Pritzker School of Medicine
2010-2011 Laura Kaplan, Pritzker School of Medicine
2011 Nina Gupta, Pritzker School of Medicine
2012 - 2015 Michael Cui, Pritzker School of Medicine
Yimo Lin, Pritzker School of Medicine
Nathan Swallow, Pritzker School of Medicine

(c) PhD – Silvio Rizzi, UIC, Member of PhD defense committee, Jan 26, 2012

CLINICAL General clinical Neurosurgeon, with specialty interest in Spine surgery and peripheral nerve surgery. Practice focused on minimally invasive and minimally disruptive approaches to the spine.

SERVICE

University of Illinois (2000-2008)

Member of Student Affairs committee, University of Illinois School of Medicine.
Member of Curriculum Development committee, University of Illinois School of Medicine.
Member of ESCRO (Stem cell research committee), University of Illinois at Chicago.
Member, committee on committees, University of Illinois at Chicago.

University of Chicago (2008-)

Committee membership:

2009 Operating room product evaluation committee
2013 Medical-legal committee
2014 Dept. of Surgery QI committee

Leadership:

2011 **Director, Neurosurgery Residency Program**

Other:

Various Interviewer of residency applicants, Section of Neurosurgery

Extramural (not indicated above)

Leadership roles:

1985- 1987 Member, Board of Directors, Galai and Galai Laboratories, LTD,
Migdal Haemek, Israel
1989- 1993 Medical Officer, IDF Medical Corps (rank of captain on discharge)
1998– 2002 Trustee, Atomergic Chemetals research fund
2007- 2008 Trustee - Temple Beth Or