

## CURRICULUM VITAE

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**NAME** Peter Erich Konrad, M.D., Ph.D.

**TITLE** Director of Functional Neurosurgery  
Associate Professor of Neurosurgery & Biomedical Engineering  
Vanderbilt University Medical Center

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**SPOUSE** Stephanie A. Konrad, B.S.N., CRNA

**DATE OF BIRTH** May 6, 1961

**PLACE OF BIRTH** Rockford, Illinois USA

### **EDUCATION**

<b>MEDICAL</b>	Residency	6/92-12/97	Neurosurgery; Vanderbilt University
	Internship	7/91/6/92	General surgery; Indiana University
	Undergraduate	8/85-4/91	M.D.; Indiana University
<b>GRADUATE</b>	Doctoral	8/85-6/88	Ph.D.; Purdue University Thesis: <u>Neurophysiological Characteristics of the Motor Evoked Potential in Rats, Cats and Dogs</u>
	Master's	8/83-8/85	M.S.; Purdue University Thesis: <u>The Implantable Arterial Pulse Sensor</u>
<b>UNDERGRADUATE</b>		8/79-5/83	B.A.; Rockford College
<b>HIGH SCHOOL</b>		8/75-5/79	Diploma; Rockford East High

**PROFESSIONAL ACTIVITIES**

**CLINICAL APPOINTMENTS**

10/00 - present	Director of Functional Neurosurgery; Vanderbilt University Medical Center, Nashville, TN
1/98 - present	Full Time Faculty; Vanderbilt University Medical Center,
7/98 - present	Provisional Staff Physician; St. Thomas Hospital, Nashville, TN
1/98 - present	Consultant Physician; Metropolitan Nashville General Hospital, Nashville, TN
1/98 - present	Staff Neurosurgeon; Veterans Administration Hospital, Nashville, TN
7/98 – 12/00	Chief of Neurosurgery; Veterans Administration Hospital, Nashville, TN
7/92 – 12/97	Resident Physician, Vanderbilt University Medical Center
7/91 – 6/92	Surgical Intern, Indiana University Hospital

**ACADEMIC APPOINTMENTS**

5/05-present	Associate Professor of Neurosurgery and Biomedical Engineering – <b>Tenured</b> ; Vanderbilt University School of Medicine
1/98-5/05	Assistant Professor of Neurosurgery; Vanderbilt University School of Medicine
6/00-9/00	Acting Chair, Department of Neurological Surgery; Vanderbilt University School of Medicine
1/98-5/05	Assistant Professor of Biomedical Engineering; Vanderbilt University School of Medicine
8/86-5/87	Lab Instructor, Medical Physiology, Purdue University
5/83-8/83	Instructor, Vertebrate Physiology, Rockford College

**MEDICAL LICENSURE**

1998-present Tennessee: MD0000030010

**MEDICAL BOARDS**

2004 Board certified, American Board of Neurological Surgeons  
1992 Diplomat, National Board of Medical Examiners

## **ACADEMIC ACTIVITIES**

### **ORGANIZATIONS**

American Association of Neurological Surgeons  
Phi Beta Kappa  
Sigma Xi  
Tennessee Neurosurgical Society  
The Vanderbilt Meacham Society (President 2003-4, 2006-7)  
The Movement Disorder Society  
The Neuromodulation Society  
American Society for Stereotactic & Functional Neurosurgery  
World Society for Stereotactic and Functional Neurosurgery  
Trigeminal Neuralgia Association

### **AREAS OF RESEARCH INTEREST**

Deep brain stimulation and neuroprosthetics  
Clinical neurophysiology of motor systems  
Optical stimulation and detection of neurological activation  
Neurosurgical navigation

### **AWARDS**

#### *Professional*

2007 Best Doctors in America  
2007 America's Top Surgeons Award  
2006 Vanderbilt University Chancellor's Research Award  
2005-6 Best Doctors in America  
2000 Who's Who in the World  
1999 Who's Who in Medicine and Healthcare  
Who's Who in Science and Engineering  
1996 Featured Alumnus - Hillenbrand Biomedical Engineering Center; Purdue University

#### *Medical School*

Medical Scientist Scholar  
Lila B. Loudan Scholarship

#### *Graduate School*

Presidential Merit M.D./Ph.D. Scholarship  
NDM Fellow  
Geddes-Laufman-Greatbatch Award  
Who's Who in Veterinary Science and Medicine  
Outstanding Young Men of America

#### *Undergraduate*

Honors at Entrance Scholar  
Presidential Scholarship  
Sigma Xi Award  
E. Melvin Gindler Award  
American Institute of Chemists Award  
Who's Who Among Students in American Colleges And Universities

## **EDITORIAL ACTIVITIES**

2006 Guest reviewer – *Magnetic Resonance Imaging*  
2004-2006 Guest reviewer – *Parkinsonism & Related Disorders*  
2002-2006 Guest reviewer – *Lasers in Surgery and Medicine*  
1995-1998 Guest reviewer – *Journal of Spinal Disorders*

#### **CONSULTING POSITIONS / CONFLICT OF INTEREST**

2002-present Consultant / Speakers Bureau. Medtronic Neurological Corporation. Minneapolis, MN. **Honoraria received for invited talks and advisory board activities.**  
2002-present Consultant. Fred Haer Corporation, Bowdoinham, ME. **Educational and research support received. Honoraria received for course and invited talks.**  
2003-2005 Consultant. Z-Kat Corporation. Hollywood, FL. **No fees received.**

#### **RESEARCH GRANTS**

2006-2010 Investigator. Computer-assisted functional neurosurgery. PI: Benoit Dawant, Ph.D., NIH-NIBIB, 1 R01-EB006136-01. 9.7% effort. \$2,039,806.  
2005-2010 Investigator. Optical stimulation of neural tissue. PI: E. Duco Jansen, Ph.D., NIH-NINDS, R01-NS052407-01. 5% effort. \$1,748,851.  
2005-2008 Consultant. Multimodal registration of the brain's cortical surface. PI: Michael I. Miga, Ph.D., NIH-NINDS, R01 NS049251-01. 0%, effort. \$970,897.  
2005-2006 Investigator. Development of a high resolution, high throughput optical nerve/brain stimulator. PI: E. Duco Jansen, Ph.D., NIH/NINDS/NIBIB (SIBR with Aculight). R43-NS51926-01. 0% effort. \$202,284.  
2004-2009 Co-investigator. Safety and Tolerability of Neurostimulation in Early Stage Parkinson's Disease. PI: P. David Charles. Medtronic Neurological Inc. 0% effort. \$650,000.  
2003–2007 Principle investigator. Optical stimulation of neural tissue in rat. Medical Free Electron Laser Center. Dept. of Defense. F49620-01-1-0429. 10% effort. \$50,000/yr.  
2003–2005 Consultant. High resolution multimodal imaging of neuronal circuits in hippocampal slices. PI: Robert Bodenheimer. SPAWAR SYSTEMS/DARPA/NAVY, Department of Defense DSR #16966. 5% effort, \$350,000.00.  
2000-2006 Co-investigator. Dose-escalation trial of continuously infused recombinant-methionyl human glial cell line-derived neurotrophic factor for the treatment of PSP. PI: Thomas Chase, MD. 5% effort. \$85,000/yr. direct cost. NIH #00-N-0145.  
2000-2003 Principle investigator. Optical stimulation of neural tissue in rat and frog. Medical Free Electron Laser Center. N00014-99-1-0779. 10% effort. Dept. of Defense. \$45,770.  
1999-2004 Faculty. Research Experiences for Undergraduates for Technology Guided Therapy. PI: Robert Galloway, Ph.D. \$312,5000. NSF #EEC-9820566. 0% effort., \$62,500 direct cost.  
1999–2001 Co-Investigator. Use of the FEL in resection of benign brain tumors in humans. Medical Free

Electron Laser Center. PI: Dr. Michael Copeland. 0% effort. Center for Medical and Materials Research with FELs, Office of Naval Research, Contract #N00014-94-1-1023.

- 1998–1999 Consultant. Randomized, Double-Blind, Placebo-Controlled, Dose-Escalation trial of Intracerebroventricular Recombinant-Methionyl Human Glial Cell Line-Derived Neurotrophic Factor (r-metHuGDNF) for the Treatment of Patients with Idiopathic Parkinson’s Disease. PI: Thomas Davis. Amgen / Medtronic. 0% effort.
- 1998–1999 Principle Investigator. Welding of Peripheral Nerves Using the FEL laser. Medical Free Electron Laser Fellowship Program. N00014-94-1-1023. Dept. of Defense. 0% effort. Fellow: Dr. Haifeng Chen. \$50,000.

## TEACHING / ACADEMIC

### *Administrative Duties:*

- 2005-2006 Chair. *FEL Director Search Committee*. Vanderbilt University.
- 2000-2001 Committee member. *Neurology Chair Search committee*. Vanderbilt University School of Medicine.

### *Professional Courses / Conferences:*

- 2006 – present Faculty. “Activa University: Frameless Stereotaxy”. Medtronic sponsored course for neurosurgeons on the use of StarFix stereotaxy system.
- 2004 - present Faculty. “Activa University: Focus on Patient Selection”. Medtronic sponsored physicians course on DBS therapy.
- 2002 – 2006 Director. *Use of StarFix miniature stereotactic frame*. Course for neurosurgeons, neurologists and neurophysiologists on the use of the microTargeting Platform®.
- 1998 – 2006 Faculty lecturer. Surgical science rotation – 3<sup>rd</sup> year medical students. Awarded Good Teacher - 2002.
- 2001 Director. *Patient conference on stimulation and central neuropathic pain*. Sept. 14, 2001. Sponsored by Medtronic, Inc.
- 2001 Co-Director. *Epilepsy: Progress and Possibilities. An epilepsy patient forum*. Vanderbilt University Medical Center.
- 1999–2004 Faculty. *Research experiences for undergraduates for technology guided therapy*. NSF grant administered through Department of Biomedical Engineering.
- 1999, 2003 Surgical implantation of the vagal nerve stimulator. *Cyberonics Hands-On Workshop*. Vanderbilt University, Nashville, TN.
- 1998–2000 Course Director. *Spine Workshop for Residents*. Vanderbilt University Medical Center.

### *Post-Doctoral Fellows:*

- 2006-2007 *David Sun, MD, PhD*. Neurosurgical Functional Research Fellow: Clinical outcomes of epilepsy surgery. Vanderbilt University.
- 2005–2007 *Hong Yu, MD*. Neurosurgical Functional Research Fellow: Physiological atlas development.

Vanderbilt University.

- 2004-2006 *John Spooner, MD.* Neurosurgical Functional Research Fellow: Use of miniature stereotactic frames (StarFix system) for DBS. Vanderbilt University.
- 1998-1999 *Haifeng Chen, MD.* Neurosurgical Functional Research Fellow (FEL Center): Laser welding of peripheral nerves. Nanjing University, China.

*Graduate Committees:*

- 2004- *Jonathan Wells, MS.* Optical Stimulation of Central Nervous System Neurons. Ph.D. Biomedical Engineering. Vanderbilt University. Committee member.  
*2005 Best Student Research Paper 2006, Vanderbilt University*
- 2000- *Andrew Bass.* Ultrasound guidance for stereotaxy. M.S. Biomedical Engineering. Vanderbilt University. Committee member.
- 2004-2006 *Pierre-Francois D'Haese, MS.* Creation of an electrophysiological atlas for the planning and guidance of Deep Brain Stimulators (DBS) implantation.. Ph.D. Computer and Electrical Engineering thesis. Completed 1/26/06. Catholic University of Louvain, Belgium. Committee member.
- 2003-2004 *Pierre-Francois D'Haese.* Toward the creation of an electrophysiological atlas for the pre-operative planning and intra-operative guidance of Deep Brain Stimulator (DBS) implantation. Completed 2004. M.S., Catholic University of Louvain, Belgium. Committee member.
- 2002-2004 *Jonathan Wells.* Optical Stimulation of Peripheral Nerves in vivo. M.S. Biomedical Engineering, completed 5/2004. Vanderbilt University. Committee member.
- 1999-2002 *Steve Hartmann.* Intraoperative identification and display of cortical brain function. Ph.D. Biomedical Engineering dissertation completed 3/8/02. Vanderbilt University. Committee member.
- 1999-2002 *Stephen R. Uhlhorn.* Tissue ablation with a free-electron laser: Mechanism and clinical application. Ph.D. Biomedical Engineering dissertation completed 4/10/02. Vanderbilt University. Committee member.
- 1998-2000 *Karthikeyan Mariappan.* Optical stimulation of peripheral nerve tissue. M.S. Biomedical Engineering thesis, completed 8/00. Vanderbilt University. Co-chairman.

*Professional School Faculty Advisor Roles (Graduate Level or Higher):*

- 2003 *Susan Dengler, BSN.* Clinical Preceptor for Acute Care Nurse Practitioner Program. Vanderbilt University School of Nursing. Summer 2003.

**PATENTS**

- 11/7/05 Adjustable Universal Surgical Platform. US Patent Application – Filed (#14506-52807). Kao, C., Fitzpatrick, JM., Labadie, R., Konrad, P.
- 7/13/05 Flat Cut Bit for Cranial Perforator. US Patent Application – Filed (#V054078.14US). Kao, C., Konrad, P.
- 3/3/05 System and Methods for Optical Stimulation of Neural Tissues. US Patent Application #11/071,060.
- 7/5/02 Apparatus and Methods of Multi-modal 3-D Targeting in Deep-Brain Stimulation. U.S. Provisional patent application #60/394,220.
- 8/16/00 Methods of Optical Stimulation of Neural Tissues. US Patent Application #60/225,690.

## **PUBLICATIONS**

### **PEER REVIEWED PUBLICATIONS**

1. **Konrad PE**, Tacker WA, Levy WJ, Reedy DP, Cook JR, and Geddes LA. Motor evoked potentials in the dog: Effects of global ischemia on spinal cord and peripheral nerve signals. *Neurosurgery* 20(1): 117 - 124, 1987.
2. **Konrad PE**, Tacker WA, Bourland JD, Geddes LA, and Hood DL. A new implantable arterial pulse sensor for detection of ventricular fibrillation. *Medical Instrumentation* 22(6): 304 - 311, 1988.
3. **Konrad PE**, Geddes LA, Tacker WA, Reuter D, Schooler D, and Dull ST. Existence of a strength-duration curve for spinal cord motor-evoked potentials in cats. *Electroencephalography and clinical Neurophysiology* 74: 463 - 468, 1989.
4. Dull ST, **Konrad PE**, and Tacker WA. Amplitude and latency characteristics of spinal cord motor evoked potentials in the rat. *Electroencephalography and clinical Neurophysiology* 77: 68 - 76, 1989.
5. **Konrad PE**, Tacker WA, Bourland JD, and Geddes LA. Implanted pulse sensors for measuring blood pressure continuously using pulse wave velocity. *Journal of Clinical Engineering* 14(6): 487 - 491, 1990.
6. **Konrad PE** and Tacker WA. Suprathreshold brain stimulation activates non-corticospinal motor evoked potentials in cats. *Brain Research* 522: 14 - 29, 1990.
7. Cook JR, **Konrad PE**, and Tacker WA. Amplitude and latency characteristics of spinal cord motor-evoked potentials in dogs. *American Journal of Veterinary Research* 51(9): 1340 - 1344, 1990.
8. Reuter DG, Tacker WA, Badylak SF, Voorhees WD, and **Konrad PE**. Correlation of motor-evoked potential response to ischemic spinal cord damage. *Journal of Thoracic and Cardiovascular Surgery* 104:262 - 272, 1992.
9. **Konrad PE**, Owen JH, and Bridwell KH. Magnetic stimulation of the spine to produce lower extremity EMG responses: significance of coil position and the presence of bone. *Spine* 19(24): 2812-2818, 1994.
10. Reuter DG, Tacker WA, Babbs CF, Badylak SF, Voorhees WD, and **Konrad PE**. Preliminary results of deferoxamine and LI treatment of spinal cord ischemia. *Journal of Thoracic and Cardiovascular Surgery* 109: 1017-1019, 1995.
11. Shinomiya K, Dawson J, Spengler D, **Konrad PK**, and Blumenkopf BB. An analysis of the posterior epidural ligament role on the cervical spinal cord. *Spine* 21(18): 2081 - 2088, 1996.
12. Millan E, Abou-Khalil BW, Delbeke D, and **Konrad PE**. Frontal localization of absence seizures demonstrated by ictal positron emission tomography. *Epilepsy and Behaviour* 2: 54 – 60, 2001.
13. Charles PD, **Konrad PE**, Fang JY, Battle E, Jacobs BL, and Davis TL. Lead migration in deep brain stimulation. *Parkinsonism and Related Disorders* 7: S76, 2001.
14. Cmelak AJ, Abou-Khalil BW, **Konrad PE**, Duggan D, and Maciunas RJ. Stereotactic radiosurgery for medically-intractable mesial temporal lobe epilepsy: A case report. *Seizure* 10(6):442-6, 2001.
15. Garland EM, Anderson JC, Black BK, Kessler RM, **Konrad PE**, and Robertson D. No increased herniation of the cerebellar tonsils in a group of patients with orthostatic intolerance. *Clinical Autonomic Research* 12(6): 472-6, 2002.

16. Damian MM, Davis TL, **Konrad PE**, Roberts AG, Pfister AA, and Charles PD. Deep Brain Stimulation: A New Treatment for Parkinson's Disease. *Tennessee Medicine* 96(1): 33-35, 2003.
17. Song J, Abou-Khalil BW, and **Konrad PE**. Intraventricular monitoring for temporal lobe epilepsy: report on technique and initial results in eight patients. *Journal of Neurology, Neurosurgery and Psychiatry* 74(5): 561-5, 2003.
18. Song J, Burkey B, and **Konrad PE**. Lateral approach to a neurenteric cyst of the cervical spine: Case presentation and review of surgical technique. *Spine* 28(4): E81-E85, 2003.
19. Roberts AG, Graves CR, **Konrad PE**, Grooms TE, Pfister AA, Damian MM, and Charles PD. Intrathecal baclofen pump implantation during pregnancy. *Neurology* 61(8): 1156-1167, 2003.
20. Bhambhani D, Abou-Khalil B, **Konrad PE**, and LaGrange A. Vanderbilt Experience of Selective Amygdalohippocampectomy Surgery in Patients with Mesial Temporal Lobe Epilepsy. *Epilepsia* 45(suppl. 7):158, 2004.
21. Padaliya BB, Davis TL, Newman WJ, **Konrad PE**, Covington CD, Gill CE, Abramovitch AI, and Charles PD. Bilateral globus pallidus internus deep brain stimulation therapy for primary generalized dystonia. *Tennessee Medicine*, 97(7): 317-318, 2004.
22. Charles PD, Padaliya BB, Newman WJ, Covington CD, Gill CE, Fang JY, So SA, Tramontana MG, **Konrad PE**, and Davis TL. Deep brain stimulation of the subthalamic nucleus reduces antiparkinsonian medication cost. *Parkinsonism and Related Disorders*, 10: 475-479, 2004.
23. Wells J, Kao C, Mariappan K, Albea J, Jansen ED, **Konrad P**, Mahadevan-Jansen A. Optical stimulation of neural tissue *in vivo*. *Optics Letters*, 30(5):504-506, 2005.
24. Fitzpatrick JM, **Konrad PE**, Nিকেle C, Cetinkaya E, and Kao C. Accuracy of customized miniature stereotactic platforms. *Stereotactic and Functional Neurosurgery*, 83 (1): 25–31, 2005.
25. D'Haese P-F , Cetinkaya E, **Konrad PE**, Kao C, Dawant BM. Computer-aided placement of deep brain stimulators: from planning to intra-operative guidance. *IEEE Transactions on Medical Imaging*, 24(11): 1469-1478, 2005.
26. Wells J, Kao CC, Jansen ED, **Konrad PE**, and Mahadevan-Jansen A. Application of infrared light for *in vivo* neural stimulation. *Journal of Biomedical Optics*, 10(6): 64003-11 (2005).
27. Schadt CR, Cox KL, Tramontana MG, Byrne DW, Davis TL, Fang JY, **Konrad PE**, Padaliya B, Mutter RW, Gill CE, Richardson CR, and Charles PD. Depression and intelligence in patients with Parkinson's disease and deep-brain stimulation. *Journal of the National Medical Association*, 98 (7): 1121-25 (2006).
28. Yu H, Yao T, Spooner J, Stumph J, and **Konrad PE**. Delayed occurrence of multiple spinal drop metastases from a posterior fossa chroid plexus papilloma: case report – 20050906-1567rl. *Journal of Neurosurgery: Spine*, 4 (6): 494-496 (2006)
29. Wells J, Mahadevan-Jansen A, Bendett M, Webb J, Ralph H, Kao CC, **Konrad PE**, and Jansen ED. Lasers Stimulate New Techniques in Nerve Studies. *Biophotonics International*, 13 (10): 30-32, (2006).
30. Schadt, CR; Charles PD; Davis TL; and **Konrad PE**. Thalamotomy, DBS-VIM, and DBS-GPI for Generalized Dystonia: A Case Report. *Tennessee Medicine*, 100(2):38-39 (2007).
31. Gill CE, **Konrad PE**, Davis TL, and Charles PD. Deep Brain Stimulation for Parkinson's Disease: The Vanderbilt University Medical Experience 1998 – 2004. *Tennessee Medicine*, 100(4):45-47 (2007).
32. Gill CE, Taylor HM, Blair CR, Ayers GD, **Konrad PE**, and Charles PD. Improvement in direct care delivery after spasticity treatment in adults with intellectual disabilities living in a development center. *Neurology*; 70 (Suppl 1): A16 (2008).
33. Charles PD, Gill CE, **Konrad PE**, and Davis TL. Effect of medication washout on motor function in early stage Parkinson's Disease. *Neurology*; 70 (Suppl 1): A60 (2008).
34. Wells J, **Konrad PE**, Kao CC, Jansen ED, and Mahadevan-Jansen A. Pulsed laser versus electrical energy for peripheral nerve stimulation. *Journal Neural Modulation*, submitted April 2006.
35. Wells J, Konrad PE, Kao CC, Jansen ED, and Mahadevan-Jansen A. Stimulating nerves with laser precision. *SPIE*, submitted April 2006.
36. Wells J, **Konrad PE**, Kao CC, Mahadevan-Jansen A, and Jansen ED. A comparative study of the methodology and recorded potentials elicited from nerves stimulated with pulsed laser versus standard electrical energy. In preparation for submission 2006.

## EDITORIAL REMARKS

1. **Konrad PE**, Tacker WA, Cook JR, and Hood DL. Choice of anesthetics for MEP studies [letter]. *Neurosurgery* 20(2): 347, 1987.
2. Tacker WA, **Konrad PE**, and Dull ST. Direct non-invasive monitoring of spinal cord motor function during thoracic aortic occlusion [letter]. *Journal of Vascular Surgery* 9(1): 177 - 178, 1989.
3. **Konrad PE** and Tacker WA. Pyramidal vs. extrapyramidal origins of the MEP [letter]. *Neurosurgery* 29(5): 795 - 796, 1991.

## ABSTRACTS AND PRESENTATIONS

1. **Konrad PE**. Techniques in extracellular recording of neural activity. *Abstracts of the 76th Annual Meeting of the Illinois State Academy of Science*, Macomb, IL, April 22 - 23, 1983, p. 30.
2. Tacker WA, Bourland JD, **Konrad PE**, Nelson JP, Durrer DL, Walther T, and Geddes LA. Perivascular impedance sensors for *in vivo* chronic blood pressure measurement: Detection systems for automatic defibrillators, cardioverters and blood pressure controllers. *Proceedings of the 37th Annual Conference on Engineering in Medicine and Biology*, Los Angeles, CA, September 14 - 19, 1984, p. 20.
3. **Konrad PE**, Tacker WA, Bourland JD, Walther TA, Durrer D, and Geddes LA. Improved detection for automatic implantable defibrillation. *Proceedings of the AAMI 20th Annual Meeting*, Washington, D.C., May, 1988, p. 56.
4. Tacker WA and **Konrad PE**. Components of the feline spinal cord motor evoked potential. *FASEB Proceedings*, Las Vegas, NV, April 1988.
5. **Konrad PE**, Tacker WA, and Schooler D. Monopolar vs. bipolar electrical brain stimulation in the genesis of feline motor evoked potentials. *Proceedings of the AAMI 23rd Annual Meeting*, Washington, D.C., May, 1988, p. 56.
6. **Konrad PE** and Tacker WA. Selection of motor evoked potential monitoring locations. *Proceedings of the AAMI 23rd Annual Meeting*, Washington, D.C., May, 1988, p. 56.
7. Tacker WA, **Konrad PE**, Reuter D, and Geddes LA. Strength-duration curves for complex spinal cord motor evoked potentials. *Proceedings of the AAMI 23rd Annual Meeting*, Washington, D.C., May, 1988, p. 98.
8. Tacker WA and **Konrad PE**. Electrical vs. magnetic brain stimulation to elicit motor evoked potentials. *Proceedings of the AAMI 23rd Annual Meeting*, Washington, D.C., May, 1988, p. 98.
9. **Konrad PE**, Tacker WA, and Schooler D. Peak latencies of feline spinal cord motor evoked potentials in response to electrical transcranial brain stimulation. *Proceedings of the 18th Annual Meeting of the Society for Neuroscience*, Toronto, Ontario, Canada, November 1988, p. 772.
10. Schooler D, Tacker WA, and **Konrad PE**. Variability observed in motor evoked potential responses obtained with two different stimulus montages. *Proceedings of the Annual Meeting of the Joint Section on Disorders of the Spine and Peripheral Nerves*, Cancun, Mexico, February 11 - 15, 1989.
11. **Konrad PE** and Tacker WA. Evidence for non-corticospinal motor evoked potentials in cats using suprathreshold brain stimulation. *Proceedings of the 1989 International Motor Evoked Potential Symposium*, Chicago, IL, August 17 - 20, 1989, p. 13.
12. Reuter DG, Tacker WA, **Konrad PE**, Voorhees WD, and Badylak SF. Correlation of MEPs, SSEPs, regional blood flow, motor function, and spinal cord histopathology in a canine model of spinal cord ischemia: a preliminary study. *Proceedings of the 1989 International Motor Evoked Potential Symposium*, Chicago, IL, August 17 - 20, 1989, p. 34.
13. **Konrad PE**, Owen JH, and Bridwell KH. Magnetic stimulation of the spine to produce lower extremity EMG responses: significance of coil position and the presence of bone. *Scoliosis Research Society Meeting*, Minneapolis, MN, September 24 - 27, 1991.
14. Shinomiya K, Dawson J, Spengler D, **Konrad PE**, and Blumenkopf B. An analysis of the posterior epidural ligament role on the cervical spinal cord. *Proceedings of the 23rd Annual Cervical Spine Research Society Meeting*, Santa Fe, NM, Nov 30 - Dec 2, 1995.
15. **Konrad PE** and Berkman R. Occipital-cervical loop/screw fixation for occipito-atlantal instability. *Proceedings of the 13<sup>th</sup> Annual Meeting of the Joint Section on Disorders of the Spine and Peripheral Nerves*, Newport Beach, CA, February 19 - 22, 1997, p. 137.
16. **Konrad PE** and Blumenkopf BB. Surgical treatment and outcome of 40 consecutive patients with herniated thoracic discs and review of literature. *Proceedings of the 1997 Annual Meeting of the Southern Neurosurgical Society*, Pinehurst, NC, June 5 - 8, 1997, p. 13.

17. Blumenkopf BB and **Konrad PE**. Surgical treatment and outcome of 40 consecutive patients with herniated thoracic discs and review of literature. *Annual Meeting of the Congress of Neurological Surgeons*, New Orleans, LA, 1997.
18. **Konrad PE** and Gadamsetty S. Use of image fusion technique to avoid ventriculography for stereotactic target planning. *Annual Meeting of the Congress of Neurological Surgeons*, Boston, MA, October, 1999.
19. **Konrad PE**, Chen H, Kusuma S, and Robertson D. Loss of hypertension with lateral medullary infarcts. *Annual Meeting of the Congress of Neurological Surgeons*, Boston, MA, October, 1999.
20. **Konrad PE** and Abou-Khalil BW. Endoscopically placed temporal horn electrodes for hippocampal monitoring. *Annual Meeting of the Congress of Neurological Surgeons*, Boston, MA, October, 1999.
21. Hartmann S, Galloway RL, and **Konrad PE**. Intraoperative identification and display of eloquent cortical regions. *Proceedings of SPIE: Medical Imaging*, San Diego, CA, February 18, 2001, Vol. 4319, pp. 126-133.
22. **Konrad PE** and Kao CC. Treatment of diffuse central neuropathic pain through the use of cingulum neuromodulation. *Neuromodulation: Defining the Future*, Cleveland, OH, June 8 0 10, 2001.
23. Warner JS and **Konrad PE**. One centimeter post-traumatic subluxation of the odontoid presenting as chronic daily headaches. *American Headache Society Meeting*, New York, NY, June 29 – July 2, 2001.
24. Song J, Abou-Khalil BW, and **Konrad PE**. Intraventricular depth electrode monitoring for temporal lobe epilepsy: A technical report. *American Epilepsy Society Meeting*, Philadelphia, PA, December 2, 2001.
25. **Konrad PE**, Kao CC, Davis TL, and Shieh C. Evidence for strength-duration curve in humans undergoing thalamic stimulation for tremor control. *American Association of Neurological Surgeons Meeting*, Chicago, IL, April 6 – 11, 2002.
26. Kao CC, **Konrad PE**, Davis TL, and Zhang J. Minimal tissue reaction to thalamic lead implantation for tremor: a post-mortum study at 22 months. *American Association of Neurological Surgeons Meeting*, Chicago, IL, April 6 – 11, 2002.
27. Charles PD, **Konrad PE**, Battle EJ, Jacobs BL, Fang JY, and Davis TL. Deep brain stimulation of the bilateral subthalamic nucleus reduces the cost of antiparkinsonian medications. *Movement Disorder Society 7th International Congress of Parkinsons Disease & Movement Disorder*, Miami, FL, Nov. 10 - 14, 2002.
28. Franck JI, **Konrad PE**, Franklin R, and Haer F. StarFix™: a novel approach to frameless stereotactic neurosurgery utilizing a miniaturized customized pretargeted cranial platform fixture - technical description, unique features, and case reports. *Movement Disorder Society 7th International Congress of Parkinsons Disease & Movement Disorder*, Miami, FL, Nov. 10 - 14, 2002.
29. Kremer MA, Song J, and **Konrad PE**. Lag Screw Fixation of an Acute Hangmans Fracture: Case Illustration. *Southern Medical Association 96<sup>th</sup> Annual Scientific Assembly – Neurosurgery*, Washington, DC, Nov. 13 – 16, 2002.
30. **Konrad PE**, Abou-Khalil BW, Weil RJ, Sillay K. Surgical outcome after left selective amygdalohippocampectomy versus tailored left temporal lobectomy. *The 56<sup>th</sup> Annual Meeting of the American Epilepsy Society Meeting*, Seattle, WA, Dec. 6-11, 2002.
31. Nickele C, Cetinkaya E, Fitzpatrick JM, and **Konrad PE**. Evaluation of a method for placing deep-brain stimulators. *Proc. SPIE Intl. Symposium on Medical Imaging*, San Diego, CA, February 16 – 18, 2003.
32. Albea JR, Kao CC, Fatakia A, Jansen D, Mahadevan-Jansen A, and **Konrad PE**. Optical Stimulation of Peripheral Nerve. *American Association of Neurological Surgeons annual meeting*, San Diego, CA, April 26 - May 1, 2003, (Supported by grant FA9550-04-1-0045 from the DOD MFEL Program)
33. Albea JR, Kao CC, and **Konrad PE**. Simultaneous Bilateral Subthalamic DBS with parallel neurophysiologic localization data. *American Assoc. of Neurological Surgeons annual meeting*, San Diego, CA, April 26 - May 1, 2003.
34. Dawant BM, Rui L, Cetinkaya E, Fitzpatrick JM, and **Konrad PE**. Computerized atlas-based positioning of deep brain stimulators: a feasibility study. *BME Annual Meeting*, Philadelphia, PA, June 2003.
35. Kao CC, Albea JR, and **Konrad PE**. Asymmetry of hyperactivity between left and right subthalamic nucleus parallels severity of extremity symptoms in Parkinson's disease patients. *Society for Neuroscience annual meeting*. November 8 – 11, 2003, New Orleans, LA., USA.
36. Bhambhvani D, Abou-Khalil B, **Konrad P**, Lagrange A. Outcome of selective amygdalo-hippocampectomy and ictal pattern in patients with mesial temporal lobe epilepsy. *American Epilepsy Society*. December 3 – 7, 2004.
37. D'Haese PF, Cetinkaya E, Kao CC, Michael JM, **Konrad PE**, and Dawant BM. Toward the Creation of an Electrophysiological Atlas for the Pre-operative Planning and Intra-operative Guidance of Deep Brain Stimulators (DBS) Implantation. *7<sup>th</sup> International Conference on Medical Imaging and Computer Assisted Intervention*, St. Malo, France,

September 26 – 30, 2004.

38. D'Haese PF, Cetinkaya E, Kao CC, Michael JM, **Konrad PE**, and Dawant BM. Method for Identifying Brain Nuclei from Micro-Electrode Signals. *American Society for Stereotactic & Functional Neurosurgery* annual meeting, Cleveland, OH, October 1 – 3, 2004.
39. Gajendiran M, Lima EA, **Konrad P**, Kao C, and Baudenbacher, FJ. High resolution multi-electrode mapping of thalamocortical oscillations in *in vitro* rat brain slices during high frequency deep brain stimulation, *American Society for Stereotactic & Functional Neurosurgery* meeting, Cleveland, OH, October 1-3, 2004.
40. D'Haese PF, Cetinkaya E, Kao CC, Michael JM, **Konrad PE**, and Dawant BM. Creation and Use of an Atlas of Optimal Positions for the Fully Automatic Selection of DBS Target Points. *American Society for Stereotactic & Functional Neurosurgery* meeting, Cleveland, OH, October 1 – 3, 2004.
41. Wells J, Mariappan K, Albea J, Jansen ED, **Konrad PE**, Mahadevan-Jansen A, Kao C. Optical stimulation of neural tissue. *Annual Meeting of the Society for Neuroscience*, San Diego, CA, October 2004.
42. Kao CC, Thomas T, Charles PD, Fang J, Albea J, and **Konrad PE**. Correlating Symptoms and Neuronal Activities – Bilateral Simultaneous Microrecordings from Parkinson's and Essential Tremor Patients. *ASSFN Neuromodulation Meeting*, Cleveland, OH, October 1 – 3, 2004.
43. Spooner J, **Konrad PE**, and Cheng J. Motion preservation in the surgical treatment of Hangman's fractures using posterior lag screws. *AANS/CNS Section on Disorders of the Spine & Peripheral Nerves* 2005 Annual Meeting, Phoenix, AZ, March 9 – 12, 2005.
44. D'Haese P-F, Pallavaram S, Niermann K, Spooner J, Kao CC, **Konrad PE**, and Dawant BM. Automatic selection of DBS target points using multiple electrophysiological atlases. *Lecture Notes in Computer Science, MICCAI 2005*.
45. Spooner J, Yu H, D'Haese PF, Pallavaram S, Kao CC, Humbert G, Dawant B, and **Konrad PE**. Fully-automated Deep Brain Stimulation target selection better than traditional methods. *AANS Annual meeting*, San Francisco, CA, April 22 – 27, 2006.
46. Kao CC, Spooner J, Yu H, Davis T, Fang J, Hedera P, Cooper M, Charles PD, and **Konrad PE**. Direct zona incerta stimulation produces efficacy in treating Parkinson's disease – an intraoperative study during the STN mapping. *American Society for Stereotactic & Functional Neurosurgery* meeting, Boston, MA, June 1 – 4, 2006.
47. Pallavaram S, D'Haese PF, Spooner J, Yu H, **Konrad PE**, and Dawant BM. Automated selection of anterior and posterior commissures based on a deformable atlas can remove variability in the current frame of reference used for stereotactic neurosurgical procedures. *American Society for Stereotactic & Functional Neurosurgery* meeting, Boston, MA, June 1 – 4, 2006.
48. Spooner J, Tatsas A, Abel T, Yu H, Kao CC, **Konrad PE**, and Davis TL. Deep brain stimulation in white matter superior to STN is effective in Parkinson's disease: a 5-year postmortem analysis. *American Society for Stereotactic & Functional Neurosurgery* meeting, Boston, MA, June 1 – 4, 2006.
49. Yu H, Spooner J, Davis TL, Hedera P, and **Konrad PE**. Confined stimulation using two adjacent parallel thalamic deep brain stimulation electrodes to rescue refractory essential tremor. *American Society for Stereotactic & Functional Neurosurgery* meeting, Boston, MA, June 1 – 4, 2006.
50. **Konrad PE**, Margolin L, Franklin R, and Kao CC. Customized stereotactic system for research in animals: Advantages of a rapid-prototyped platform over traditional stereotactic frames. *Society for Neuroscience* annual meeting, Atlanta, GA, October 14 – 18, 2006.
51. **Konrad PE**, Kao CC, Franck JI, Spooner J, Yu H, Charles PD, Fang JY, and Davis TL. Deep brain stimulating electrodes placed using a novel miniature stereotactic frame: Clinical Experience from 144 patients. *10<sup>th</sup> International Congress of Parkinson's Disease and Movement Disorders*, Kyoto, Japan, October 28 – November 2, 2006.
52. Kao CC, Spooner J, Yu H, Charles PD, Davis TL, Fang JY, and **Konrad PE**. Improved patient comfort and surgical efficiency using the Starfix Stereotaxy System in 106 patients undergoing DBS implantation. *10<sup>th</sup> International Congress of Parkinson's Disease and Movement Disorders*, Kyoto, Japan, October 28 – November 2, 2006.
53. Yu J, Spooner J, Davis TL, Hedera P, Fang JY, and **Konrad PE**. Confined stimulation using two adjacent parallel thalamic deep brain stimulation electrodes to rescue refractory essential tremor. *10<sup>th</sup> International Congress of Parkinson's Disease and Movement Disorders*, Kyoto, Japan, October 28 – November 2, 2006.
54. Kao CC, Yu H, Spooner J, Hedera P, and **Konrad PE**. Train stimulation has identical efficacy as continuous stimulation in VIM DBS: a strategy to prolong battery life. *10<sup>th</sup> International Congress of Parkinson's Disease and Movement Disorders*,

Kyoto, Japan, October 28 – November 2, 2006.

55. **Konrad PE**, Spooner J, Yu H, Hedera P, and Kao CC. Improved energy efficiency in train versus continuous stimulation of STN for rigidity suppression in a PD patient. *10<sup>th</sup> International Congress of Parkinson's Disease and Movement Disorders*, Kyoto, Japan, October 28 – November 2, 2006.
56. Diedrich L, Gamboa A, **Konrad PE**, Robertson D, and Diedrich A. Pain, Heart Rate, Blood Pressure and Sympathetic Activity in Chronic Pain Patients with Epidural Spinal Cord Stimulator. The American Autonomic Society 17<sup>th</sup> International Symposium. Rio Grande, Puerto Rico, USA, Nov 1 -4, 2006.
57. Abu-Ata MM, Abou-Khalil B, Haas K, Lavin P, Sun D, and **Konrad PE**. Visual field defects after selective transcortical amygdalohippocampectomy. 1<sup>st</sup> North American Regional Epilepsy Congress – Annual Meetings of the AES, Canadian League against Epilepsy and Jamaican Chapter of ILAE, San Diego, CA, USA, December 1 -5, 2006.
58. Pallavaram S, Yu H, Spooner J, D'Haese P-F, Koyama T, Bodenheimer B, **Konrad PE**, and Dawant BM. Automated selection of anterior and posterior commissures based on a deformable atlas and its evaluation based on manual selections by neurosurgeons. *SPIE Symposium on Medical Imaging*, San Diego, CA, USA, Feb. 17-22, 2007.
59. Pallavaram S, Yu H, Spooner J, D'Haese P-F, Koyama T, Bodenheimer B, **Konrad PE**, and Dawant BM. The VU-DBS project: intergrated and computer-assisted planning, intra-operative placement, and post-operative programming of deep-brain stimulators. *SPIE Symposium on Medical Imaging*, San Diego, CA, USA, Feb. 17-22, 2007.
60. Pallavaram S, Yu H, Spooner J, D'Haese P-F, Koyama T, Bodenheimer B, **Konrad PE**, and Dawant BM. Automated selection of anterior and posterior commissures bsd on a deformable atlas and its evaluation based on manual selections by neurosurgeons. *SPIE Symposium on Medical Imaging*, San Diego, CA, USA, Feb. 17-22, 2007.
61. Diedrich L, **Konrad PE**, Sukdeb D, Robertston D, and Diedrich A. Valsalva maneuver and Spinal Cord Stimulation in Complex Regional Pain Syndrome. *ASA Annual Meeting*, San Francisco, CA, USA, October 13-17, 2007.

## **SPEAKING ENGAGEMENTS**

1. The use of motor evoked potentials for intraoperative monitoring. Rockford Memorial Hospital Scientific Meeting, Rockford, Illinois, March 5, 1988.
2. Motor evoked potentials. Neuroscience Grand Rounds, Indiana University Medical Center, Indianapolis, IN, May 12, 1988.
3. New methods of assessing the nervous system during surgery. Sigma Xi Club of Rockford, Rockford, IL, March 11, 1991.
4. Motor evoked potentials. Neurology Grand Rounds, Vanderbilt University Medical Center, Nashville, TN, October 14, 1992.
5. Basics of motor evoked potentials. Multidisciplinary Spine Conference, Vanderbilt University Medical Center, October 22, 1992.
6. Functional monitoring of spinal motor tracts. Meacham Neurosurgical Society Meeting, Vanderbilt University Medical Center, October 22, 1993.
7. Surgical treatment of epilepsy. Sigma Xi Club of Rockford, Rockford College, October 19, 1994.
8. Visiting alumni in residence. Guest lecturer in the Departments of Chemistry, Biology, and Nursing. Rockford College. October 15 - 20, 1994.
9. Occipital cervical stabilization techniques. Meacham Neurosurgical Society Meeting, Vanderbilt University Medical Center, June 27-29, 1996.
10. An analysis of the posterior epidural ligament role on the cervical spinal cord. Meacham Neurosurgical Society Meeting, Vanderbilt University Medical Center, June 27-29, 1996.
11. Intraoperative mapping of cortical function during neurosurgery. Neuroscience Grand Rounds, Vanderbilt University Medical Center, February, 1997.
12. Spinal cord monitoring during neurosurgery. Neuroscience Grand Rounds, Vanderbilt University Medical Center, March, 1997.
13. Vagal nerve stimulation for epilepsy - When and when not to use. Tennessee Neurosurgical Society Meeting, September 11-13, 1998.
14. Intrathecal baclofen therapy for spasticity. Tennessee Chapter of the America Physical Therapy Association's Annual Meeting, October 16, 1998.

15. Trends in Neuroscience: Neuroprosthetics and Neurosurgery. 1999 Neuroscience Update. St. Thomas Hospital, April 30, 1999.
16. Deep Brain Stimulation Program at Vanderbilt University. Vanderbilt Meacham Neurosurgical Society Meeting, June 11, 1999.
17. Central Neuropathic Pain. Neuroscience Grand Rounds, Vanderbilt University Medical Center, March 10, 2000.
18. Surgical Treatment of Trigeminal Neuralgia. Middle Tennessee Support Group for Trigeminal Neuralgia. St. Thomas Hospital, Nashville, TN, May 22, 2000.
19. Stimulating neurons with light. Vanderbilt Meacham Society Meeting. Ponte Vedra, FL, June 2-3, 2000.
20. Update: Vanderbilt Epilepsy Program. Vanderbilt Meacham Society Meeting. Ponte Vedra, FL, June 2-3, 2000.
21. "It's not brain surgery, but..." – common sense as a physician. Indiana University School of Medicine, Invited First Year Medical School orientation lecture. W. Lafayette, IN, August 18, 2000.
22. Neuroprosthetics: The Future of Clinical Neuroscience. Invited talk. Indiana University School of Medicine, W. Lafayette, IN, August 18, 2000.
23. Deep Brain Stimulation, Neuro-modulation. Section of Surgical Sciences Research conference. Vanderbilt University, Nashville, TN, March 15, 2002.
24. Surgical treatment of dystonia. Vanderbilt Meacham Society Meeting. Phoenix, AZ, November 1-3, 2002.
25. Neuroanatomy of Pain: A Neurosurgeon's Approach. Southern Society of Physical Medicine and Rehabilitation, 35<sup>th</sup> Annual Meeting. Nashville, TN, May 23, 2003.
26. FHC's microTargeting® Platform Workshop. Congress of Neurological Surgeons, 53<sup>rd</sup> Annual meeting. Denver, CO, October 20, 2003.
27. Cancer Pain. Cleveland Clinic Neuro-Oncology 2004: Current Concepts Symposium, Lake Buena Vista, FL, January 31, 2004.
28. Owensboro, KY Trigeminal Neuralgia Support Meeting. Owensboro, KY, March 13, 2004.
29. The Surgical Treatment of Parkinson's Disease: Surgical Options and when they are appropriate. Schwarz Pharma – Neuroscience/Parkinson's Disease meeting, The Hermitage Hotel, Nashville, TN, July 9, 2004.
30. Surgical Procedure Overview. DBS Focus & Programming Session, Medtronic Activa University, Detroit, MI, August 7, 2004.
31. Applications and Techniques of Deep Brain Stimulation. Tennessee Neurosurgical Society, Nashville, TN, August 21, 2004.
32. Neurological Applications of Optical Spectroscopy. Vanderbilt-Meacham Neurological Society, Vanderbilt Children's Hospital, Nashville, TN, September 26, 2004.
33. Creation and Use of a Physiological Atlas for Automated Selection of DBS Target Points. Neuromodulation: Defining the Future 2004. ASSFN 2004 Biennial Meeting, Cleveland, OH, October 1-3, 2004.
34. Starfix Microtargeting Platform System. microTargeting Platform System Roundtable Session, Cleveland, OH, October 2, 2004.
35. All About Activa Seminar. An informal discussion about Deep Brain Stimulation (DBS) for Parkinson's disease. The Marriott at Vanderbilt University, Nashville, TN, January 18, 2005.
36. Medtronic focus on Activa Therapy. Tampa, FL, February 18 – 20, 2005
37. Trigeminal Neuralgia Support Group Meeting. Nashville, TN, March 28, 2005.
38. Arrival of the Cybernetic Man: Bioengineering and Neurosurgery in the 21st Century. Indiana University external advisory board annual MD/Ph.D. retreat, keynote speaker Bloomington, IN, August 3, 4, & 5, 2005.
39. Neurostimulation in clinical neurosciences. Invited speaker for the Tennessee Academy of Neurology Annual Scientific Meeting. Nashville, TN, October 15, 2005.
40. DBS frameless technology for Activa Therapy: Surgeons Course. Reston, VA, January 13, 2006.
41. Medtronic Focus on Activa Therapy: Introductory Physicians Course. Nashville, TN, March 3 & 4, 2006.
42. DBS frameless technology for Activa Therapy: Surgeons Course. San Francisco, CA, April 1, 2006.
43. Trigeminal Neuralgia Support Group Meeting. Murfreesboro, TN, April 8, 2006.

44. DBS and Parkinson's Disease. American Parkinson's Disease Association Patient Conference. Nashville, TN, May 20, 2006.