

**CURRICULUM VITAE  
OREGON HEALTH & SCIENCE UNIVERSITY**

**NAME**            **Nathan R. Selden, MD, PhD, FACS, FAAP**

**DATE**            **December 12, 2014**

**I. PRESENT POSITION AND ADDRESS**

**Academic Rank:**            **Campagna Chair of Pediatric Neurosurgery (Tenured)**  
**Department/Division:**    **Neurological Surgery/Pediatric Neurosurgery**  
**Professional Address:**    **CH8N, 3303 SW Bond Avenue, Portland, Oregon, 97239**  
**E-Mail Address:**            **seldenn@ohsu.edu**

**II. EDUCATION**

**Undergraduate and Graduate:**

1993    Doctor of Medicine, Cum Laude, Harvard Medical School

- John E. Thayer Scholarship, Harvard University, 1993. Presented annually to one graduate of Harvard Medical School for academic excellence.
- Aesculapian Honors Society, Harvard Medical School, 1993.

1990    Doctor of Philosophy, Departments of Experimental Psychology and Anatomy, University of Cambridge

- Marshall Scholar, United Kingdom, 1986 to 1989.
- President, Jesus College Middle Combination Room (Graduate Society), University of Cambridge, 1987-88.
- Tutor, Natural Sciences (Biology B), Queen's College, University of Cambridge, 1987-1989.

1986    Bachelor of Arts, With Distinction, Human Biology, Stanford University

- Dinkelspiel Award, the Stanford University Commencement Prize, 1986.
- Dean's Award for Service, Stanford University, 1986.
- E.C. Converse Honors Scholarship, Stanford University, 1985-86.
- Phi Beta Kappa, Stanford University, 1985.
- Legislative Intern for U.S. Senator Max Baucus, Washington, D.C., 1981. Wrote "An Intern's Views of the Hill," *The Washington Post*, June 7, 1981.

**Postgraduate (Include Year, Degree, and Institution):**

1999-2000 Fellow, Pediatric Neurological Surgery, Children's Memorial Hospital, Northwestern University Medical School, July to March.

1998-1999 Chief Resident, Neurological Surgery  
University of Michigan Medical Center

- Award of the American Academy of Neurological Surgery, 1998.
- Resident Award, Galens Medical Society, University of Michigan Medical School, for dedication to medical student teaching, 1999.

1993-1998 Intern and Resident, Neurological Surgery  
University of Michigan Medical Center

1997-1998 Postdoctoral Fellow, Neuroanatomy, Department of Neurology, Northwestern University Medical School, July to March.

**Certification (Include Board, Number, Date, and Recertification):**

American Board of Neurological Surgery #24032 (Participating MOC)	2004
American Board of Pediatric Neurological Surgery	2011
Controlled Substance Certificate, Drug Enforcement Administration	1999
Basic Life Support/Advanced Cardiac Life Support Certification	1997
Diplomat of the American Board of Medical Examiners	1994

**Licenses (Include State, Date, Status, Number, and Renewal Date):**

Oregon	2000	Active	MD22319	Renewal date: 12/31/2016
Illinois	1999	Inactive	036-099800	Renewal date: NA
Michigan	1998	Inactive	430-106-1835	Renewal date: NA

**III. PROFESSIONAL EXPERIENCE**

**Academic (Include Year, Position, and Institution):**

Mario and Edith Campagna Chair of Pediatric Neurosurgery, July 2012 to present.

Mario and Edith Campagna Professor of Pediatric Neurosurgery, July 2009 to present.

Mario and Edith Campagna Associate Professor of Pediatric Neurosurgery, October 2005 to June 2009.

Vice-Chairman for Education, Department of Neurological Surgery, Oregon Health & Science University, September, 2003 to present.

Professor, Department of Pediatrics, Oregon Health & Science University.

Professor, Department of Behavioral Neuroscience, Oregon Health & Science University.

**Administrative (Include Year, Position, and Institution):**

Program Director, Neurological Surgery Residency, Oregon Health & Science University, February 2005 to present.

- ACGME Parker J. Palmer Courage to Teach Award, 2013.
- ACGME site visit, 5 year full accreditation with commendation, complement increase from 14 to 18 residents, 'notable practice' designation, 2012.
- ACGME site visit, 5 year full accreditation, 2005.

Head, Division of Pediatric Neurological Surgery, Department of Neurological Surgery, Oregon Health & Science University, August, 2000, to present.

Director, Pediatric Neurological Surgery, Doernbecher Children's Hospital, July, 2002 to present.

- Member, *Gold Humanism Honor Society*, The Arnold P. Gold Foundation, 2013 to present.
- Best Oregon Doctors. *Portland Monthly Magazine*, December 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2013, 2014.
- Best Doctors in America, 2005-2006, 2007-2008, 2008-2009, 2009-2010, 2010-2011, 2011-12, 2012-2013, 2013-2014, 2014-2015 at [www.bestdoctors.com](http://www.bestdoctors.com).
- Guide to America's Top Surgeons, Consumers' Research Council of America, 2008, 2009, 2010, 2011, 2012, 2013 at [www.consumersresearchcncl.org](http://www.consumersresearchcncl.org).
- America's Top Doctors, Castle Connolly Medical, Ltd., 2008, 2009, 2010, 2011, 2012, 2013, 2014 (13th edition), at [www.castleconnolly.com](http://www.castleconnolly.com) (listed nationally and in Portland Monthly best doctors edition).
- U.S. News & World Report Top Doctors, 2011, 2012, 2013, 2014.
- 40 Rose Award Medal, Oregon Health & Science University, May 2006.
- 'Exceptional Mentor' designation, School of Medicine Class of 2014.

Director, Pediatric Neurotrauma, Oregon Health & Science University, June 2000 to July 2002; October 2004 to November 2008; and January 2012 to present.

Co-founder and co-director, Comprehensive Pediatric Brain Tumor Clinic, Doernbecher Children's Hospital, September, 2000, to July, 2007.

Director, Resident Education, Neurological Surgery Residency, Oregon Health & Science University, September, 2002, to September, 2003.

**Other (Include Year, Position, and Institution):**

Attending Surgeon, Doernbecher Children's and OHSU Hospitals, May, 2000, to present.

Attending Surgeon, Veteran's Affairs Medical Center, Portland, Oregon, June, 2000, to September, 2007.

Consultant Surgeon, Shriners Hospital for Children, Portland, Oregon, September, 2002, to present.

Associate Consultant Surgeon, Shriners Hospital for Children, Portland, Oregon, June, 2000, to August, 2002.

Courtesy Staff Surgeon, Department of Neurological Surgery, St. Vincent's Medical Center, Portland, Oregon, October, 2000, to present.

Associate Attending Surgeon, Children's Memorial Hospital, Chicago, Ill., July, 1999, to March, 2000.

Participant, OHSU Physician Leadership Academy, The Advisory Board Company, June to October, 2006.

Accreditation Council for Continuing Medical Education (ACCME) Training Course, Chicago, Ill., December, 2006.

**IV. SCHOLARSHIP**

**Area(s) of Research/Scholarly Interest:**

1. *Medical evidence in Pediatric Neurological Surgery.* I have tested diagnostic criteria and surgical indications for spinal dysraphism, including tethered cord syndrome and Chiari malformation, by both compiling and evaluating original medical evidence. This work has included patho-anatomical study of surgical specimens and systematic review of the surgical literature on spinal cord tethering due to thickened filum terminale. I have also served twice as one of 12 to 15 academic clinical experts on a national task force that authored guidelines for the medical management of severe traumatic brain injury in infants, children and adolescents.
2. *Cellular therapy for neurodegenerative disease in children.* I served as the Surgeon and Co-Principal Investigator for the first trial of neuronal stem cell therapy in humans, which is also the first clinical trial of a purified stem cell population of any kind in the central nervous system. This Phase I trial was undertaken to treat neuronal ceroid lipofuscinosis (types 1 and 2), commonly known as Batten Disease, a uniformly fatal inherited metabolic condition. We

- successfully surgically implanted neuronal stem cells in all six study patients. Trial rationale and design parameters, and clinical results have been published. Long term follow-up results are being analyzed.
3. *Novel educational methods in neurological surgery*. See Educator's portfolio. This represents novel intellectual contributions, online educational products, and curricular development associated with the ACGME, including extensive reports within the peer-reviewed literature, as well as service within OHSU and nationally in leadership, committee and collaborative roles.
  4. *Nociceptive modulatory circuitry in the amygdala and rostral ventromedial medulla (RVM)*. I have utilized both lightly anesthetized and awake behaving rat models of nociception to evaluate the pharmacological anatomy of pain modulatory pathways in the limbic system and brainstem. In one project our laboratory has identified pharmacological subtypes of RVM neurons that are pro- or anti-nociceptive, or neutral. Each functional neuronal subtype is characterized by the presence of contrasting purinergic receptor subtypes, identified using physiological or immunohistochemical techniques. In another project, we have identified a novel adrenergic input to the nociceptive amygdala that mediates the effects of environmental stress on analgesia.

#### **Grants and Contracts:**

##### Federal/National (Include Title, Source, PI, Amount Period, and % Effort)

Feed and Swaddle (natural sedation for infant brain imaging), Co-I (PI Dr. Anna Kuang), Doernbecher Impact Award, 2014, \$10,000.

Fundamental skills and knowledge training for neurological surgery PGY1 residents, National Courses Director - Nathan Selden, \$1,890,000 (2011-15), grant from Stryker education to the Society of Neurological Surgeons and Congress of Neurological Surgeons (plus extensive in kind donations from Stryker and multiple other sponsors).

Outcomes in patients undergoing surgical intervention for Chiari type I malformation and syringomyelia, Syringomyelia and Chiari Alliance Project, site PI for OHSU (National PI Bermans Iskandar, Univ. of Wisconsin).

Park-Reeves Outcomes Registry in Chiari I malformation, Washington University St. Louis Chiari Outcomes Project, site PI for OHSU (National PI Tae Sung Park, Washington University St. Louis).

DIPG Biology and Treatment Study - Site co-PI. \$7000 per patient enrollment. January 2011 to present.

Phase Ib testing of purified neural stem cells in patients with infantile neuronal ceroid lipofuscinosis (Batten disease), PI - Nathan Selden, Approx \$100,000 (Neurosurgery) plus 5% FTE, Stem Cells, Incorporated, Palo Alto, CA, November 2010 to November 2012. Discontinued June 2011 due to narrow eligibility window and non-accrual.

Phase I testing of purified neural stem cells in patients with infantile neuronal ceroid lipofuscinosis (Batten disease), Co-PI – Nathan Selden, \$80,000 (Neurosurgery), Stem Cells, Incorporated, Palo Alto, CA, March 1, 2006 to January 31, 2009.

Long term follow-up of patients transplanted with purified neural stem cells, Co-I, Nathan Selden, January 2008 to present, 5% FTE.

Purinergic control of medullary pain modulation. NIH KO8 Career Development Award (5 years), PI – Nathan Selden, \$726,000 direct costs, October 1, 2002 to September 30, 2007.

Purinergic control of medullary pain modulation. Child Health Research Center/NICHHD award (3 years), Junior investigator – Nathan Selden, \$75,000 direct costs, July 1, 2002 to June 30, 2005.

Neurochemistry of the human basal ganglia. Hartford Foundation/American Federation for Aging Research Fellowship. Recipient: Nathan Selden, Mentor: M.-Marsel Mesulam, Director, Behavioral Neurology Unit, Beth Israel Hospital and Harvard Medical School, Boston, Massachusetts. \$10,000, 1992.

Cerebral cortical neurochemistry. Harvard Medical School/National Institutes of Health Research Fellowship. Recipient: Nathan Selden, Mentor: M.-Marsel Mesulam, Director, Behavioral Neurology Unit, Beth Israel Hospital and Harvard Medical School, Boston, Massachusetts. \$2,500, 1990.

State and Local (Include Title, Source, PI, Amount Period, and % Effort)

Bioabsorbable intrafascial stent for 3<sup>rd</sup> Ventriculostomy, device engineering development. Cameron Foundation, PI – Nathan Selden, \$50,000, November, 2009 and \$50,000 November 2010.

Amygdala and stress induced analgesia. Miller Family Foundation, PI – Nathan Selden, \$40,000, November 2008.

Amygdala and stress induced analgesia. Cameron Foundation, PI – Nathan Selden, \$100,000, December 2006.

Bioabsorbable intrafascial stent for 3<sup>rd</sup> Ventriculostomy, pre-clinical testing in sheep. Bioscience Innovation Fund, OHSU/State of Oregon, \$80,000, 2007-2009.

Other Support (Include Title, Source, PI, Amount Period, and % Effort)

Co-Mentor, GCRC Medical Student Clinical Research Award, Ms. Jennifer Haser, OHSU, July 2005-June 2006, \$25,000.

Co-mentor, Tarter Foundation, OHSU, Resident Research Grant, to Dr. Jonathan Carlson, MD, PhD (Neurosurgical House Officer), \$2000, 2004.

British Marshall Scholar, United Kingdom, 1986-1989, \$90,000.

Molecular markers in tumors and cerebrospinal fluid as prognostic factors in pediatric and adolescent central nervous system tumors. Co-I - Nathan Selden, Dickenson Foundation of California, \$36,405, 1998.

Cholinergic anatomy in the human cerebral hemisphere. Brownell Fund/University of Michigan Neurological Surgery Research Grant. Recipient: Nathan Selden, \$6000, 1997.

Human cerebral cortical anatomy. Lake Odessa Seizure Awareness Association Grant. PI - Nathan Selden, \$2800, 1997.

Student Research Award, American Geriatrics Society, \$3000, 1992.

Comparative biology of immunological hormone regulation. American Heart Association/Oregon Affiliate Research Fellowship. Recipient: Nathan Selden, Mentor: Laurens Ruben, Director, Immunology Laboratory, Reed College, Portland, Oregon, \$3000, 1985.

Murine interleukins. University of California at Los Angeles/Associated Western Universities Undergraduate Research Fellowship. Recipient: Nathan Selden, Mentor: Takashi Makinodan, Director, Geriatric Research and Education Center, West Los Angeles VA Medical Center, Los Angeles, California, \$3000, 1983.

Pending Support (Include Title, Source, PI, Amount Period, and % Effort)

### **Publications/Creative Work:**

#### Peer-reviewed

Selden, NR (2015) Professionalism includes personal accountability and independence (ethical point-counterpoint on duty hours exceptions). *American Medical Association Journal of Ethics* (formerly *Virtual Mentor*). January 2015, Volume 17, Number 1: 23-32. <http://virtualmentor.ama-assn.org/2015/01/ecas3-1501.html>

Kuang, A., and Selden, N.R. (2014) Secondary cranial vault remodeling for restenosis after primary sagittal synostosis repair, Case report. *In press, Pediatric Neurosurgery*.

Strong, M.J., Thompson, E.M., Roundy, N., and Selden, N.R. (2015) Use of lumbar laminoplasty vs. laminotomy for transection of the filum terminale does not affect complication rates or post-operative course. *Child's Nervous System*, DOI 10.1007/s00381-015-2615-8

Zammar SG, Hamade YJ, Aoun RN, El Teclé NE, El Ahmadiéh TY, Adelson PD, Kurpad SN, Harrop JS, Hodge H, Mishra RC, Rajshekar V, Rezai AR, Sankhla S, Sattur MG, Selden NR, Sharan A, Resnick DK, Bendok BR. (2014) The Cognitive and Technical Skills Impact of the Congress of Neurological Surgeons Simulation Curriculum on Neurosurgical Trainees at the 2013 Neurological Society of India Meeting. *World Neurosurgery*. 12/2014; DOI: 10.1016/j.wneu.2014.12.006.



Maire, J.J., Close, L.N., Heinricher, M.M. and Selden, N.R. (2013). Distinct pathway for opioid and norepinephrine-triggered antinociception from the Amygdala. *Submitted, European Journal of Pain*.

Taylor, D.R., Venable, G.T., Jones, G.M., Lepard, J.R., Roberts, M.L., Saleh, N., Sidiqi, S.K., Moore, A., Khan, N., Michael, L.M., Selden, N.R., and Klimo, P. (2014) Five-year institutional bibliometric profiles for 103 U.S. neurosurgical residency programs. *In press, Journal of Neurosurgery*.

Yue, E.L., Meckler, G.D., Fleischman, R., Selden, N.R., Bardo, D.M.E., Chu, A.K., Vu, E.T., Rongwei, F., and Spiro, D.M. (2015) Test characteristics of Quick-brain MRI for shunt evaluation in children: A new modality to avoid unnecessary radiation. *Journal of Neurosurgery: Pediatrics. Accompanied by podcast*, DOI: 10.3171/2014.9.PEDS14207.

Parker, S.L., McGirt, M.J., Asher, A.L., and Selden, N.R. (2014) Quality improvement in neurological surgery graduate medical education. *In press, Neurosurgery Clinics of North America*.

Asher, A.L., Parker, S.L., Rolston, J., Selden, N.R., and McGirt, M.J. (2014) Using clinical registries to improve the quality of neurosurgical care. *In press, Neurosurgery Clinics of North America*.

Asher, A.L., Speroff, T., Dittus, R.S., Parker, S.L., Davies, J., Selden, N.R., Nian, H., Glassman, S., Mummaneni, P., Shaffrey, C. Watridge, C., Cheng, J., and McGirt, M.J. (2014) The national neurosurgery quality and outcomes database (N2QOD): A collaborative north American outcomes registry to advance value-based spine care. *Spine* 10.1097/BRS.0000000000000579.

Klimo, P., Venable, G.T., Khan, N.R., Taylor, D.R., Shepherd, B.A., Thompson, C.J., and Selden, N.R., (2014) Bibliometric evaluation of pediatric neurosurgery in North America. *Journal of Neurosurgery:Pediatrics*, October DOI:10.3171/2014.8.PEDS1488.

Thompson, E.M., Wagner, K., Kronfeld, K., and Selden, N.R. (2013) Using a two variable method in radionuclide shuntography to predict shunt patency. *Journal of Neurosurgery*, Sept 26:1-4 (epub ahead of print), accompanied by podcast.

Fontes, R.B.V., Selden, N.R., and Byrne, R.W. (2014) Fostering and assessing professionalism and communications skills in neurosurgical education. *Journal of Surgical Education*, October (epub ahead of print), doi: 10.1016/j.jsurg.2014.06.016

Thompson, E.M., Baird, L.C., and Selden, N.R. (2014) Results of a North American survey of quick brain MRI utilization to evaluate cerebral ventricles in children. *Journal of Neurosurgery:Pediatrics*, June, DOI: 10.3171/2014.2PEDS13567

Thompson, E.M., Strong, M.J., Warren, G., Woltjer, R.L. and Selden, N.R. (2014) The clinical significance of filum terminale MRI and histological characteristics in tethered cord syndrome, *Journal of Neurosurgery:Pediatrics*, 13:255-259 (accompanied by podcast).

Curry, M., Whitney, N., Roundy, N., and Selden, N.R. (2014) Acute subdural hematoma in a child with previous bilateral encephaloduroarteriosynangioses. *Child's Nervous System*, 30(4):699-702, DOI 10.1007/s00381-013-2285-3

Ragel, B.T., Piedra, M.D., Klimo, P., Burchiel, K.J., Waldo, H., McCartney, S. and Selden, N.R. (2014) An ACGME duty hour compliant three-person night float system for neurosurgical residency programs, *Journal of Graduate Medical Education*, June 2014, DOI: <http://dx.doi.org/10.4300/JGME-D-13-00172.1>

Selden, N.R., Origitano, T.C., Hadjipanayis, C., and Byrne, R. (2013) Model based simulation for early neurosurgical learners, *Neurosurgery* (with accompanying podcast), October 2013, 73:S15-24.

Litvack, Z.N., Lindsay, R., and Selden, N.R. (2013). Dural splitting craniocervical decompression for Chiari I malformation in pediatric patients: Clinical outcomes, healthcare costs and resource utilization. *Neurosurgery*, doi: 10.1227/NEU.0b013e31828ca1ed.

Kuang, A.A., Bergquist, C., Crupi, L., Oliverio, M., and Selden, N.R. (2013) Effectiveness and safety of independent pediatric nurse practitioners in evaluating plagiocephaly. *Plastic and Reconstructive Surgery*, *Plastic and Reconstructive Surgery*, August, 132:414-18, PRS-D-13-00072.

Kuang, A.A., Jenq, T., Didier, R., Moneta, L., Bardo, D., and Selden, N.R. (2013). Benign radiographic coronal synostosis after sagittal synostosis repair. *Journal of Craniofacial Surgery*, 24(3): 981-984.

Cetas, J., Nasser, M., Saedi, T., Kuang, A.K., McCartney, S. and Selden, N.R. (2013) Delayed intracranial hypertension after cranial vault remodeling for single suture synostosis. *Journal of Neurosurgery: Pediatrics*, April 2013, DOI: 10.3171/2013.3.PEDS12525.

Selden, N.R., Anderson, V.C., McCartney, S., Origitano, T.C., Burchiel, K.J., and Barbaro, N.M. (2013) Society of Neurological Surgeons boot camp courses: Knowledge retention and relevance of hands on learning after 6 months of postgraduate year 1 training. *Journal of Neurosurgery*, April 2013, DOI: 10.3171/2013.3.JNS122114 (Accompanied by podcast, editorial, and editorial response).

Selden, N.R., Al-Uzri, A.A., Koch, T., Sikora, D.M., Nguyen-Driver, M.D., Guillaume, D.J., Koh, J.L., Gultekin, S.H., Anderson, J.C., Vogel, H., Sutcliffe, T.L., Huhn, S.L., and Steiner, R.D. (2011) Transplantation of Human Central Nervous System Stem Cells for Infantile and Late Infantile Neuronal Ceroid Lipofuscinosis. *Journal of Neurosurgery*, DOI: 10.3171/2013.3.PEDS12397 (Accompanied by podcast).

Selden, N.R., Abosch, A., Byrne, R., Harbaugh, R., Krauss, W., Mapstone, T., Sagher, O., Zipfel, G., Derstine, P., and Edgar, L. (2013) Neurosurgery Milestones, *Journal of Graduate Medical Education*, March, 2013, supplement, 24-35. DOI: <http://dx.doi.org/10.4300/JGME-05-01s1-04>

Swing, S.R., Beeson, M.S., Carraccio, C., Coburn, M., Iobst, W., Selden, N.R., Stern, P., and Vydareny, K. (2013) Educational milestone development in 7 specialties entering the Next Accreditation System. *Journal of Graduate Medical Education*, March 2013, 98-106. DOI: <http://dx.doi.org/10.4300/JGME-05-01-33>.

Selden, N.R., Ghogawala, Z., Harbaugh, R.E., Litvack, Z.N., McGirt, M.J. and Asher, A.L. (2013) The future of practice science: Challenges and opportunities for neurosurgery. *Journal of Neurosurgery: Focus*, 34(1):E8.

McGirt, M.J., Speroff, T., Godil, S.S., Cheng, J., Selden, N.R., and Asher, A.L. (2013) Outcomes science in practice: An overview and initial experience at the Vanderbilt spine center. *Journal of Neurosurgery: Focus*, 34(1):E7.

Asher, A.L., McCormick, P., Selden, N.R., Ghogowala, Z., and McGirt, M.J. (2013) The National Neurosurgery Quality and Outcomes Database and NeuroPoint Alliance: Rationale, development, and implementation. *Journal of Neurosurgery: Focus*, 34(1):E2.

Thompson, E.M., Wozniak, S.E., Roberts, C.M., Kao, A., Anderson, V.C., and Selden, N.R.\* (2012) Vagal nerve stimulation for partial and generalized epilepsy from infancy to adolescence. *Journal of Neurosurgery: Pediatrics*, 10:200-205. 10.3171/2012.5.PEDS11489.

Piedra, M., Thompson, E., Selden, N.R.\*, Ragel, B., and Guillaume, D (2012) Optimal timing of autologous cranioplasty after decompressive craniectomy in children. *Journal of Neurosurgery: Pediatrics*, 10:268-272, 10.3171/2012.6.PEDS1268.

Whitney, N.L., and Selden, N.R.\* (2012) Pullout proofing external ventricular drains: Technical note. *Journal of Neurosurgery: Pediatrics*, 10:320-323, 10.3171/2012.7.PEDS1280.

Oh, K.H., Kennedy, A., Selden, N.R., Mclean, L. and Sohaey, R. (2011) Asymmetric ventriculomegaly, interhemispheric cyst, dysgenesis of the corpus callosum (AVID): An imaging triad. *Journal of Ultrasound in Medicine*, 31:1811-1820.

Selden, NR,\* Origiano, TC, Burchiel, KJ, Getch, CC, Anderson, VC, McCartney, S, Abdulrauf, SI, Barrow, DL, Ehni, BL, Grady, MS, Hadjipanayis, CG, Heilman, CB, Popp, AJ, Sawaya, R, Schuster, JM, Wu, JK, and Barbaro, NM (2012) A national fundamentals curriculum for incoming neurosurgery PGY1 residents: The 2010 Society of Neurological Surgeons Boot Camp courses. *Neurosurgery*, 70(4):971-981. DOI: 10.1097/PCC.0b013e31823f435c

Roberts, C.M., Thompson, E., and Selden, N.R.\* (2011) Transendoscopic recording of gelastic seizures from a hypothalamic hamartoma: Technical note. *Pediatric Neurosurgery*, 47(2):L147-51.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 1. Introduction. *Pediatric Critical Care Medicine* 13:S3-S6 10.1097/PCC.1090b1013e31823f31437e.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 2. Methods. *Pediatric Critical Care Medicine* 13:S7-S10 10.1097/PCC.1090b1013e31823f31843df.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker

RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 3. Indications for intracranial pressure monitoring. *Pediatric Critical Care Medicine* 13:S11-S17 10.1097/PCC.1090b1013e31823f31440c.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 4. Threshold for treatment of intracranial hypertension. *Pediatric Critical Care Medicine* 13:S18-S23 10.1097/PCC.1090b1013e31823f34424.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 5. Cerebral perfusion pressure thresholds. *Pediatric Critical Care Medicine* 13:S24-S29 10.1097/PCC.1090b1013e31823f34450.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 6. Advanced neuromonitoring. *Pediatric Critical Care Medicine* 13:S30-S32 10.1097/PCC.1090b1013e31823f31659a.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 7. Neuroimaging. *Pediatric Critical Care Medicine* 13:S33-S35 10.1097/PCC.1090b1013e31823f31865e31822.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 8. Hyperosmolar therapy. *Pediatric Critical Care Medicine* 13:S36-S41 10.1097/PCC.1090b1013e31823f36621.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 9. Temperature control. *Pediatric Critical Care Medicine* 13:S42-S45 10.1097/PCC.1090b1013e31823f31664b.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 10. Cerebrospinal fluid drainage. *Pediatric Critical Care Medicine* 13:S46-S48 10.1097/PCC.1090b1013e31823f31665f.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 11. Barbiturates. *Pediatric Critical Care Medicine* 13:S49-S52 10.1097/PCC.1090b1013e31823f36696.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 12. Decompressive craniectomy for the treatment of intracranial hypertension. *Pediatric Critical Care Medicine* 13:S53-S57 10.1097/PCC.1090b1013e31823f31672e.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 13. Hyperventilation. *Pediatric Critical Care Medicine* 13:S58-S60 10.1097/PCC.1090b1013e31823f36765.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 14. Corticosteroids. *Pediatric Critical Care Medicine* 13:S61-S63 10.1097/PCC.1090b1013e31823f31867d31820.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 15. Analgesics, sedatives, and neuromuscular blockade. *Pediatric Critical Care Medicine* 13:S64-S67 10.1097/PCC.1090b1013e31823f31867e31823.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 16. Glucose and nutrition. *Pediatric Critical Care Medicine* 13:S68-S71 10.1097/PCC.1090b1013e31823f31867fc.

Kochanek PM, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR (2012) Chapter 17. Antiseizure prophylaxis. *Pediatric Critical Care Medicine* 13:S72-S82 10.1097/PCC.1090b1013e31823f31681d.

Wozniak, SE, Thompson, EM, and Selden, NR (2011) Vagal nerve stimulator infection: Lead salvage protocol. *Journal of Neurosurgery:Pediatrics*, 7:671-675.

Duty, B.S., Wozniak, S., and Selden, N.R. (2011) Vagal nerve stimulation in conjunction with phrenic nerve pacing in a child with congenital central hypoventilation syndrome. *Journal of Neurosurgery:Pediatrics*. 7:413-415.

Thompson, E.M., Anderson, G.J., Roberts, C.R., Hunt, M.A., and Selden, N.R. (2011). Skull fixated fiducial markers in staged frameless stereotactic epilepsy surgery in children. *Journal of Neurosurgery: Pediatrics*, 7:116-119.

Byrne, R.W., Bagan, B.T., Bingaman, W., Anderson, V.C. and Selden, N.R. (2011) Emergency neurosurgical care solutions: Acute care surgery, regionalization, and the neurosurgeon. Results of the 2008 CNS Consensus Session. *Neurosurgery*, 68(4):1063-1068.

Selden, N.R., Barbaro, N., Origitano, T.C., and Burchiel, K.J. (2011) Fundamental skills for entering neurosurgery residents: Report of a Pacific region 'Boot Camp' pilot course, 2009. *Neurosurgery*, 68(3):759-764. DOI: 10.1227/NEU.0b013e3182077969

Didier, R.A., Kuang, A.A., Schwartz, D.L., Selden, N.R., Stevens, D.M., and Bardo, M.E. (2010) Decreasing the effective radiation dose in pediatric craniofacial CT by changing head position. *Pediatric Radiology*, DOI 10.1007/s00247-010-1788-2.

Connolly, E.S., Hoh, B.L., Selden, N.R., Asher, A.L., Kondziolka, D., Boulis, N., and Barker, F.G. (2010) Clipping versus coiling for ruptured intracranial aneurysms: Integrated medical learning at CNS 2007. *Neurosurgery* 66:19-34.

Oliveria, S.F., Thompson, E.M. and Selden, N.R. (2010) Lumbar lipomyelomeningocele and sacrococcygeal teratoma in two siblings: Support for the dysembryogenic theory of spinal teratoma formation. *Journal of Neurosurgery: Pediatrics*, 5:626-629.

Panczykowski, B.S., Nemecek, N., and Selden, N.R. (2010) Traumatic type III odontoid fracture and severe rotatory subluxation in a 3-year-old child. *Journal of Neurosurgery: Pediatrics* 5(2):200-203 (with Cover illustration).

Golshani, K.J., Lalwani, K., Delashaw, J.B. and Selden, N.R. (2009) Modified orbitozygomatic craniotomy for radical resection of craniopharyngioma in children. *Journal of Neurosurgery: Pediatrics* 4(4):345-352 (with Cover illustration).

Scarrow, A.M., Linskey, M., Asher, A.L., Anderson, V.C., and Selden, N.R. (2009) Neurosurgeon transition to retirement: Results of the 2007 CNS Consensus Conference. *Neurosurgery* 65(2):231-236.

Asher, A.L., Kondziolka, D., and Selden, N.R. (2009) Addressing deficiencies in American healthcare education: A call for informed instructional design. *Neurosurgery*, 65(2)223-230.

Vogelbaum, M.A., Asher, A.L., Kondziolka, D., Boulis, N.M., Selden, N.R., Hoh, B.L., and Barker, F.G. (2008) Modern treatment of cerebral metastases: Integrated medical learning at CNS 2007, *Journal of Neuro-Oncology* 93:89-105. DOI 10.1007/s11060-009-9833-4

Sohaey, R., Oh, K., Kennedy, A., Ameli, J., and Selden, N. (2009) Prenatal diagnosis of tethered spinal cord: A pictorial essay. *Ultrasound Quarterly*, 25(2):83-87.

Nevrekar, D., Abdu, E., and Selden, N.R. (2009) Craniectomy for a bilobed dermoid cyst in the temporal fossa and greater wing of the sphenoid bone: Case report. *Pediatric Neurosurgery* 45:46-48. DOI: 10.1159/000204902.

Ortiz, J.P., Close, L.N., Heinricher, M.M. and Selden, N.R. (2008) Alpha2-noradrenergic antagonist administration into the central nucleus of the amygdala blocks stress-induced hypoalgesia in awake behaving rats. *Neuroscience* 157:223-228. 10.1016/j.neuroscience.2008.08.051

Close, L., Cetas, J., Heinricher, M.M. and Selden, N.R. (2009) Purinergic receptor immunoreactivity in the rostral ventromedial medulla. *Neuroscience*, 158:915-921. 10.1016/j.neuroscience.2008.08.044

- Nicholson, N. and Selden, N.R. (2009) Poets, doctors and the rhetoric of money. *Neurosurgery*, January, 2009.
- Hedges, J.R., Newgard, C.D., Veum-Stone, J., Selden, N.R., Adams, A.L., Lenfesty, B., Diggs, B.S., Arthur, M. and Mullins, R.J. (2008) Early Neurosurgical Procedures Enhance Survival in Significant Blunt Head Injury – Observational Analysis Using Propensity Score Adjustment for Procedural Intervention, *Journal of Emergency Medicine*. doi:10.1016/j.jemermed.2008.07.001
- Guillaume, D.J., Huhn, S.L., Selden, N.R., and Steiner, R.D. (2008) Cellular therapy for neurodegenerative disease in children. Part I: Rationale and preclinical studies. *Journal of Neurosurgery: Neurosurgery Focus*, 24(3&4):E21,1-6. (DOI: 10.3171/FOC/2008/24/3-4/E21)
- Selden, N.R.\*, Guillaume, D.J., Steiner, R.D., and Huhn, S.L. (2008) Cellular therapy for neurodegenerative disease in children. Part II. Clinical trial design and implementation. *Journal of Neurosurgery: Neurosurgery Focus*, 24(3&4):E22,1-6. (DOI: 10.3171/FOC/2008/24/3-4/E22).
- Hauser, J., Nesbit, G., Scott, M., Boulis, N., and Selden, N.R.\* (2008) Family matters: A CPC case study. *Neurosurgery*, 62(1)195-201.
- Saedi, T, Cetas, J, Chang, R, Krol, A, and Selden, NR. (2008) Newborn with nevus sebaceous of Jadassohn presenting as exophytic scalp lesion. *Pediatric Neurosurgery*, 44:144-147. DOI: 10.1159/000113118.
- Ortiz, J., Heinricher, M.M., and Selden, N.R. (2007) Noradrenergic agonist administration into the central nucleus of the amygdala increases the tailflick latency in lightly anesthetized rats. *Neuroscience*, 148:737-43, 10.1016/j.neuroscience.2007.07.003.
- Selden, N.R., Carlson, J.D., Cetas, J., Close, L.N. and Heinricher, M.M. (2007). Purinergic actions on neurons that modulate nociception in the rostral ventromedial medulla. *Neuroscience*, 146:1808-1816.
- Iloff, J.J., Close, L.N., Selden, N.R., and Alkayed, N.J. (2007) A novel role for P450 eicosanoids in the neurogenic control of cerebral blood flow. *Exp. Physiology* 92(4):653-658.
- Selden, N.R. (2007) Occult tethered cord syndrome, what is necessary to justify a new surgical indication? *Neurosurgery Focus*, 23(2)E1:1-5. DOI: 10.3171/FOC-07/08/E1
- Yu, JA, Sohaey, R, Kennedy, A, and Selden, NR. (2007) Giant terminal myelocystocele and sacrococcygeal teratoma: a comparison of fetal ultrasound presentation and perinatal risk. *AJNR*, 28:1058-1060.
- Gubbels, SP, Selden, NR, Delashaw, JB, and McMenomey, SO (2007). Spontaneous middle fossa encephalocele and cerebrospinal fluid leakage: Diagnosis and management. *Otology & Neurotology*, 28(8):1131-9
- Selden, N.R. (2007) The competencies and safety. *Clinical Neurosurgery*, Vol. 53., 180-184.

Durham, SR, Liu, KC, and Selden, NR. (2006) Utility of serial CT imaging in pediatric head trauma. *Journal of Neurosurgery:Pediatrics*: October, 2006.

Ragel, B, Asher, T, Selden, N, and MacDonald, J (2006). Self-Assessment in Neurological Surgery (SANS): The SANSwired white paper. *Neurosurgery*, October 2006.

\*Selden, NR, Skoog, S, Lashley, D, and Nixon, R (2006) Minimal tethered cord syndrome is associated with thickening of the filum terminale. *Journal of Neurosurgery*: 105(3):214-218 (with Cover illustration).

\*Selden, NR (2006) Minimal tethered cord syndrome: The case for surgery. *Journal of Neurosurgery*. 104:302-304.

Carlson, J.D., Selden, N.R. and Heinricher, M.M. (2005) Nocifensive reflex-related on- and off-cells in the pedunculo-pontine tegmental nucleus, cuneiform nucleus, and lateral dorsal tegmental nucleus. *Brain Research*. 30:1063(2)187-94.

\*Selden, N.R., Durham, S.R., Anderson, G. and Braner, D. (2005) Intracranial navigation using a novel device for endoscope fixation and targeting. *Pediatric Neurosurgery*, 41:233-236.

Stephan, M.J., Nesbit, G.M., Behrens, M.L., Whitaker, M.A., Barnwell, S.L. and \*Selden, N.R. (2005) Endovascular treatment of spinal arteriovenous fistula in a young child with hereditary hemorrhagic telangiectasia. *Journal of Neurosurgery*, 103:462-465.

Limonadi, F. and \*Selden, N.R. (2004) Dural splitting craniocervical decompression: Reduced operative time, hospital stay and cost, with equivalent early outcome. *J. Neurosurgery*, 101:184-188.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 1: Introduction, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S2-4.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 2: Trauma systems, pediatric trauma centers, and the neurosurgeon, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S5-8.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 3: Prehospital airway management, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S9-11.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 4: Resuscitation of blood pressure and oxygenation and pre-hospital brain-specific therapies for the severe pediatric traumatic brain injury patient,



Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S12-18.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 5: Indications for intracranial pressure monitoring in pediatric patients with severe traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S19-24.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 6: Threshold for treatment of intracranial hypertension, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S25-27.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 7: Intracranial pressure monitoring, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S28-30.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 8: Cerebral perfusion pressure, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S31-33.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 9: Use of sedation and neuromuscular blockade in the treatment of severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S34-37.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 10: The role of cerebrospinal fluid drainage in the treatment of severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S38-39.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 11: Use of hyperosmolar therapy in the management of severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S40-44.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW

(2003) Chapter 12: Use of hyperventilation in the acute management of severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S45-48.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 13: The use of barbiturates in the control of intracranial hypertension in severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S49-52.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 14: The role of temperature control following severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S53-55.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 15: Surgical treatment of pediatric intracranial hypertension, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S56-59.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 16: The use of corticosteroids in the treatment of severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S60-64.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 17: Critical pathway for the treatment of established intracranial hypertension in pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S65-67.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 18: Nutritional support, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S68-71.

Adelson, PD, Bratton, SL, Carney, NC, Chesnut, RM, du Coudray, HEM, Goldstein, B, Kochanek, PM, Miller, HC, Partington, MD, Selden, NR, Warden, CR, and Wright, DW (2003) Chapter 19: The role of anti-seizure prophylaxis following severe pediatric traumatic brain injury, Guidelines for the Acute Medical Management of Severe Traumatic Brain Injury in Infants, Children, and Adolescents. *Journal of Trauma*, 54(6Suppl):S72-75.

- \*Sandquist, M.A., and Selden, N.R. (2003) A single pass tunneling technique for CSF shunting procedures. *Pediatric Neurosurgery* 39(5):254-257.
- \*Allen, R., Sandquist, M., Piatt, J.H. and Selden, N.R.W. (2003) Strawberry nevi are a poor indicator of occult dysraphism. *Journal of Neurosurgery*, 98:247-250.
- Papadopoulos SM. Selden NR. Quint DJ. Patel N. Gillespie B. Grube S. (2002) Immediate spinal cord decompression for cervical spinal cord injury: feasibility and outcome. *Journal of Trauma*, 52(2):323-32.
- Selden, N.R., Quint, D.J., Patel, N., d'Arcy, H.S. and Papadopoulos, S.M. (1999) Emergent MR imaging in cervical spinal cord injury: Clinical correlation and prognosis. *Neurosurgery*, 44(4):785-793.
- Selden, N.R., Gitelman, D.R., Salamon-Murayama, N., Parrish, T.B. and Mesulam, M.-M. (1998) Trajectories of cholinergic pathways within the cerebral hemispheres of the human brain. *Brain*, 121:2249-2257.
- Selden, N., Geula, C., Hersh, L., and Mesulam, M.-M. (1994) Human striatum: chemoarchitecture of the caudate nucleus, putamen and ventral striatum in health and Alzheimer's disease. *Neuroscience*, 60(3):621-636.
- Selden, N., Mesulam, M.-M., and Geula, C. (1994) Human striatum: the distribution of neurofibrillary tangles in Alzheimer's disease. *Brain Research*, 648:327-331.
- Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1992) Diencephalic noradrenaline depletion impairs the corticosterone response to footshock but does not affect conditioned fear. *Journal of Neuroendocrinology*, 4(6):773-779.
- Selden, N.R.W., Everitt, B.J., Jarrard, L.E. and Robbins, T.W. (1991) Complementary roles for the amygdala and hippocampus in aversive conditioning to explicit and contextual cues. *Neuroscience*, 42(2):335-350.
- Selden, N.R.W., Everitt, B.J. and Robbins, T.W. (1991) Telencephalic but not diencephalic noradrenaline depletion enhances behavioural but not endocrine measures of fear conditioning to contextual stimuli. *Behavioural Brain Research*, 43:139-154.
- Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1990) Enhanced behavioral conditioning to context and impaired behavioral and neuroendocrine responses to conditioned stimuli following ceruleo-cortical noradrenergic lesions: support for an attentional hypothesis of central noradrenergic function. *Journal of Neuroscience*, 10(2):531-539.
- Selden, N.R.W., Cole, B.J., Everitt, B.J. and Robbins, T.W. (1990) Damage to ceruleo-cortical noradrenergic projections impairs locally cued but enhances spatially cued water maze acquisition. *Behavioural Brain Research*, 39:29-51.
- Ruben, L.N., Beadling, C., Langeberg, L., Shiigi, S. and Selden, N. (1988) The substitution of carrier priming of helper function in the Common American Newt, *Notophthalmus Viridescens* by lectins and human lymphokines. *Thymus*, 11:77-87.

(Pending)

- Hoh, B.L., Curran, J., Rokicki, J., Ullman, J.S., Bendok, B.R., Rao, G., Selden, N.R., Resnick, D.K., and Ghogawala, Z. (2015) The comparative effectiveness of specific professional educational tools for correcting knowledge gaps among practicing neurosurgeons. Submitted to *Clinical Neurosurgery*.
- Zarella, C., Didier, R., Bardo, D., Selden, N.R., and Kuang, A.A. (2015) Radiation dose reduction in children for craniofacial CT imaging. Submitted, *Plastic and Reconstructive Surgery*.
- Pool, G.M., Didier, R., Bardo, D. Selden, N.R. and Kuang, A.K. (2015) Computed tomographic generated anthropometric measurements of orbital relationships in normal infants and children. Submitted, *Journal of Neurosurgery:Pediatrics*.
- Wong, V.W., Selden, N.R., and Kuang, A.K. (2013) A simple technique to minimize effective radiation dose in pediatric craniofacial CT, Submitted, *PRS Letters*.
- Kikuchi, K., Abraham, J., Lal, S., Davare, M., Svalina, M., Alabran, J.L., Cho, Y.-J., Jackson, M., Guillaume, D.J., Selden, N.R., Bigner, D.D., Nazemi, K., Woltjer, R., Rubin, B.P., and Keller, C. (2013) IGF1R as a key target in high risk, metastatic medulloblastoma. Submitted, *Cancer Research*.
- Ghobrial, G.M., Balsara, K., Maulucci, C.M., Berg, D., Hodge, H., Resnick, D.K., Bendok, B.B., Selden, N.R., Sharan, A.D., and Harrop, J.S. (2014) Simulation training curricula for neurosurgical residents: Foraminotomy and durotomy repair modules. Submitted, *Simulation in Healthcare*.

#### Non-peer-reviewed

- Selden, N.R. (2015) Commentary on 'Development, organisation, and implementation of a surgical skills 'boot camp' - SIMweek', *World Journal of Surgery*, DOI: 10.1007/s00268-015-2955-2.
- Selden, N.R. (2015) Presidential Message (on Neurosurgical societies coordination), *CNS Quarterly*, April 2015, *in press*.
- Selden, N.R. (2015) Presidential Message (on Graduate medical education funding), *CNS Quarterly*, January 2015, *in press*.
- Selden, N.R. (2014) Paradigm shift in US residency training: Education science and outcomes. *Progress in Clinical Neurosciences*, Volume 29, Chpt 27 (Ed. Singh, V.P. and Nair, M.D.) Thieme, December, 2014.
- Zipfel, G., Takeyama, R., Waldo, H., and Selden, N. (2014) Neurosurgery experience with implementing the milestones and clinical competency committees. *Association for Hospital Medical Education Newsletter*, Spring 2014, pp 4-5.
- Selden, N.R., Anderson, V., McCartney, S., Origitano, T.C., Burchiel, K.J., and Barbaro, N. (2013) Response to Editorial (SNS Boot Camp Courses: Knowledge retention and relevance of hands on learning after 6 months of PGY1 training). *Journal of Neurosurgery*, *Journal of Neurosurgery*, August 2013, V119, pp 534-5.
- Selden, N.R. (2013) CNS Secretary's Report, 2012. *CNS Quarterly*, Winter, 2013.

- Strong, M.J. and Selden, N.R. (2012) Simulation in neurosurgical education: Present and future considerations. *Contemporary Neurosurgery*, 34(18)September 15, 2012.
- Selden, N.R. (2012) Letter re: 'Impact of compliance with the American College of Surgeons trauma center verification requirements on organ donation-related outcomes' (Malinoski et al, *J Am Coll Surg*:215-186-192), doi.org/10.1016/j.jamcollsurg.2012.10.006.
- Selden, N.R. (2012) Commentary on 'Chiari I malformation: Analysis of intraoperative findings, complications and outcome for 371 foramen magnum decompressions'. *Neurosurgery*, *Neurosurgery*, 71(2):380.
- Selden, N.R. (2012) CNS Secretary's Report, 2011. *CNS Quarterly*, Winter 2012.
- Kochanek PM, Carney, N, Adelson PD, Ashwal S, Bell MJ, Bratton S, Carson S, Chesnut RM, Ghahar J, Goldstein B, Grant GA, Kissoon N, Peterson K, Selden NR, Tong KA, Tasker RC, Vavilala MS, Wainwright MS, Warden CR, 2012. (Authors' response) Comments about the revised guidelines for the acute medical management of severe traumatic brain injury in infants, children and adolescents. *Pediatric Critical Care Medicine*, 13(4):496-97, doi: 10.1097/PCC.0b013e318259ee85.
- Selden, N.R. (2011) Invited commentary on 'Decompressive hemicraniectomy for pediatric traumatic brain injury: Long-term outcome based on quality of life' by A. Jacob et al. *Pediatric Neurosurgery*, (DOI: 10.1159/000330885).
- Selden, N.R., Hadjipanayis, C.G., Origitano, T.C., Getch, C.C., Burchiel, K.J. and Barbaro, N.M. (2011) Bootcamp courses for incoming PGY1 neurosurgery residents utilize simulation to improve training and safety. With sidebar: The CNS partners with the Society of Neurological Surgeons to Support Resident Education. *CNS Quarterly*, Summer 2011, 21-22.
- Selden, N.R. (2011) CNS Secretary's Report, 2010. *CNS Quarterly*, Winter 2011, pp 30-31.
- Dacey, R.G. Burchiel, K.J., Barbaro, N., and Selden, N.R. (2011) ACGME Duty Hours Proposal: One Size Does Not Fit All. *CNS Quarterly*, Winter 2011, pp 25-26.
- Selden, N.R. (2010) Commentary on Efficacy of Neurosurgery Resident Education in the New Millennium: The 2008 Council of State Neurosurgical Societies Post-Residency Survey Results. *Neurosurgery*, 67(2):233.
- Rezai, A., Selden, N., Lonser, R., and Adelson, P.D. (2010) The CNS 2009 Annual Meeting. *CNS Quarterly*, Spring 2010, 22-25.
- Berger, M.S., Couldwell, W.T., Rutka, J.T. and Selden, N.R. (2010) Introduction: neurogenomics and neuroproteomics. *Journal of Neurosurgery: Focus* 28(1):E1.
- Selden, N.R. (2009) Book Review: Focus on NeuroImaging (PS Espinosa and CD Smith, LW&W, 2008), *Journal of Neurosurgery*, 111:1110-1111.
- Selden, N.R. (2009) CNS consensus sessions: Putting the annual meeting to work. *Congress Quarterly*, Fall 2009, p 22.
- Ullman, J.S., Selden, N.R. (2009) CNS Education Committee. *Congress Quarterly*, Fall 2009, pp 43-44.

- Rezai, A.R., Selden, N.R. and Lonser, R.R. (2009). A culture of excellence: the 2009 CNS annual meeting. *Congress Quarterly*, Fall 2009, pp 6-9.
- Selden, N.R., Rezai, A., Rodts, G.R. and Asher, T.A. (2009) A Community of Learning, 2008 Annual Meeting, Orlando. *Congress Quarterly*, Winter 2009, 10(1):13-14.
- Selden, N.R. and Burchiel, K.J. (2008) Competency and other support resources: the "Senior Society" website and Program Director's Toolkit, *RRC News: Neurological Surgery*, Fall, 2008.
- Selden, N.R. (2008) Commentary on 'Does adherence to treatment targets in children with severe traumatic brain injury avoid brain hypoxia? A brain oxygenation study.' *Neurosurgery*, 63(1):92.
- Selden, N.R., Rezai, A., Rodts, G.R. and Asher, T.A. (2008) CNS Consensus Sessions: We are listening. *Congress Quarterly*, Fall 2008, 9(4)10-11.
- Selden, N.R., Rezai, A. and Rodts, G.R. (2008) 2008 CNS Annual Meeting, Creating a Community of Neurosurgery. *Congress Quarterly*, Fall 2008, 9(4)8-9.
- Boulis, N.M., Asthagiri, A., Lonser, R., and Selden, N.R. (2008) Integrated Medical Learning: Expansion of a Concept. *Congress Quarterly*, Fall 2008, 9(4)16-18.
- Selden, N.R. (2008) Spinal dysraphism: Hidden meanings and cutaneous markers. Editorial Board Commentary on 'Correlation of cutaneous lesions with clinical radiological and urodynamic findings in the prognosis of underlying spinal dysraphism disorders', and 'Non-neural congenital abnormalities occurring with myelomeningocele: Report of 17 cases and review of current theories', *Pediatric Neurosurgery*, 44:371-372. (DOI: 10.1159/000149902)
- Selden, N.R. (2008) Introduction, in *Stem Cells and Central Nervous System Therapeutics*. *Journal of Neurosurgery: Neurosurgery Focus*, 24(3&4):E1,1-2. (DOI: 10.3171/FOC/2008/24/3-4/E1)
- Rodts, G.E., Asher, T.A., Selden, N.R. and Kondziolka, D. (2008) The 2007 CNS Annual Meeting: Navigating Change. *Congress Quarterly*, Winter, 2008, 14-18.
- Sheehan, J.P. and Selden, N.R. (2008) SANS Lifelong Learning: Residency Education to Maintenance of Certification. *Congress Quarterly*, Winter, 2008, 26.
- Selden, N.R., Rodts, G.E. and Asher, T.A. (2007) Scientific planning for the CNS Annual Meeting: How does it work? *Congress Quarterly*, Fall, 2007, pp 15-17.
- Selden, N.R. (2007) SANS Lifelong Learning: Competencies Module, *Congress Quarterly*, Summer, 2007: 37.
- Selden, N.R., Asher, T.A. and Muraszko, K.M. (2007) Julian "Buz" Hoff, *Neurosurgery* 61(1):51.
- Selden, N.R. (2007) Commentary on 'Comparison of section of the filum terminale and non-surgical management for urinary incontinence in patients with normal conus position and possible occult tethered cord syndrome', *Neurosurgery*, 61(3)555.
- Selden, N.R. (2007) Commentary on Brainstem lesions in neurofibromatosis type I, *Neurosurgery*, 61(4)767.

- Selden, N.R., Steinbok, P., Gupta, N., Drake, J. and Garton, H.J.L. (2007) Response to Yamada. *Journal of Neurosurgery:Pediatrics*,106(5):411-414.
- Selden, N.R. (2007) Neurosurgical residency programs: Surviving in a new accreditation era, *Congress Quarterly*, April, 2007.
- Selden, N.R. and Burchiel, K.J. (2007) Don't abandon professional neurosurgical education, *Congress Quarterly*, April, 2007
- Selden, N.R. (2007) Donald Johanson on The Origins of Humankind: The View from Africa, *Congress Quarterly*, 7(3):18.
- Selden, N.R. (2006) SANS Lifelong Learning. *Neurosurgery News*, 7(2):9.
- Selden, N.R. (2006) Non-clinical core competencies for the neurosurgeon. *Neurosurgery News*, 7(1):12.
- Selden, N.R. (2004) CPP or ICP? *Journal of Neurosurgery (Pediatrics)*. 102(1): 134-135.
- Selden, N.R., Burchiel, K.J. (2002) Commentary on Cholinergic dysfunction in subarachnoid hemorrhage, *Neurosurgery*, 51(4):947-48.
- Selden, N.R. (2001) Commentary on Midline Myelotomy. In *Pain Surgery*, K.J. Burchiel, ed., Thieme Medical Publishing, New York, N.Y.
- Burchiel, K.J. and Selden, N.R. (2001) Commentary on Comparison of frameless systems, *Neurosurgery*, 49(6):1415.
- Selden, N. (2000) Alobar Holoprosencephaly. *Pediatric Neurosurgery*, 33(2):112.
- Quint, D.J., Selden, N.R. and Papadopoulos, S.M. (1999) Response to Larson et al. *Neurosurgery*, 45(4):957.

### Books

Origitano, T.C., Selden, N.R., Barbaro, N.M., Getch, C.C., Connolly, E.S., Mapstone, T.B., and Burchiel, K.J., Society of Neurological Surgeons PGY1 Boot Camp Course Reference Guide, Society of Neurological Surgeons and Congress of Neurological Surgeons, 2011.

Selden, N.R. (Editor), Stem Cells and Central Nervous System Therapeutics, *Neurosurgery Focus*, at [www.thejns.org](http://www.thejns.org) March/ April, 2008.

Dissertation for the M.D. degree with honors in a special subject (neuroanatomy): "Chemoarchitecture of the human striatum in health and Alzheimer's disease." Harvard Medical School, Boston, Massachusetts, 1993.

Dissertation for the Ph.D. degree: "Attentional functions of the locus ceruleus noradrenergic system." University of Cambridge, Cambridge, United Kingdom, 1989.

### Chapters

Raskin, J., Litvack, Z. and Selden, N.R. (2015) Split spinal cord. In Winn, H.R., (ed): *Youman's Textbook of Neurological Surgery*, 7th Edition, Elsevier, N.Y., New York, Section VII, *Invited submission*.

Farrell, B. and Selden, N.R., Traumatic Brain Injury, in *Pediatric Neurosurgery: Tricks of the Trade*, Section 5, Chapter 44. *Submitted*.

Thompson, E. and Selden, N.R. (2013) Cellular therapy for pediatric neurological disease. In *Principles and Practice of Pediatric Neurosurgery*. Albright, A.L., Pollock, I.F., and Adelson, P.D. (Thieme), *in press*.

Carlson, J.D., Selden, N.R. and Burchiel, K.J. (2013) Vagus Nerve Stimulation. In Berta and Levy (Eds.) *Neurosurgery: Tricks of the Trade*. Thieme, Nader, Gragnaniello, Berta, Sabbah and Levy (Eds), Chpt 127, pp 595-7.

Litvack, Z. and Selden, N.R. (2011) Split spinal cord. In Winn, H.R., (ed): *Youman's Textbook of Neurological Surgery*, 6th Edition, Elsevier, N.Y., New York, Section VII, Chpt. 216, 2219-2226.

Selden, N.R., Hudson, G., and Skoog, S.R. (2009) Spinal dysraphism and neurogenic bladder dysfunction. In *Pediatric Neurosciences for Primary Care*, Piatt, JHP (Editor) AAP Press, pp 495-542.

Litvack, Z.N. and Selden, N.R. (2008) Pediatric Traumatic Brain Injury. In *Acute Management of Brain and Spinal Cord Injury: Evolving Paradigms*, A. Bhardwaj, D. Ellegala and J. Kirsch, eds., Informa, New York, N.Y.

Selden, N.R. (2006) Pediatric neurotrauma. In *Pediatric Neurosurgery*, D. Frim and N. Gupta, ed., Landes Bioscience, Georgetown, Texas, pp 67-95.

Carlson, J.C., Selden, N.R., Burchiel, K.J. and Heinricher, M.M. (2005). Nociceptive on- and off-cells in the mesopontine tegumentum. *Clinical Neurosurgery*, Vol 52, Chpt. 48.

Everitt, B.J., Robbins, T.W. and Selden, N.R.W. (1990) Functions of the locus ceruleus noradrenergic system: a neurobiological and behavioural synthesis. In *The Pharmacology of Noradrenaline in the Central Nervous System*, D.J. Heal and C.A. Marsden, eds., Oxford University Press, Oxford. Chapter 11, pp. 349-378.

#### Electronic Publications

Selden, N.R. (2014) Milestones Pilot Group: Update and Data Collection Automation, Powerpoint Lecture Set from SNS PD-PC Symposium, May 2014, at ACGME website (in press).

Selden, N.R., Abosch, A., Byrne, R., Derstine, P., Edgar, L., Harbaugh, R., Krauss, W., Mapstone, T.B., Sagher, O., and Zipfel, G. (2013) Milestones compatible evaluation system for neurological surgery (12 evaluations, key, milestones listing, additional elements document, and explanatory Powerpoint lecture set), at ACGME, at <http://www.acgme-nas.org/>, and at SNS, at [www.societyns.org](http://www.societyns.org), July 2013.

Selden, N.R. (2013) The Clinical Competency Committee: Data Driven Education and Assessment (Powerpoint lecture set for Program Director and Coordinator 2014 SNS meeting workshop) at ACGME



(<http://acgme.org/acgmeweb/tabid/135/ProgramandInstitutionalAccreditation/SurgicalSpecialties/NeurologicalSurgery.aspx>) and SNS websites, June, 2013.

Selden, N.R., Abosch, A., Byrne, R., Derstine, P., Edgar, L., Harbaugh, R., Krauss, W., Mapstone, T.B., Sagher, O., and Zipfel, G. (2013) Neurological Surgery Milestones, ACGME, at <http://www.acgme-nas.org/>

Extradural Chiari Decompression, NEUROSURGERY Video Gallery, <http://journals.lww.com/neurosurgery/pages/videogallery.aspx?videoId=320&autoplay=true>, May 2013,

Neurosurgery Milestones, a Neurosurgery Program Director Workshop. Neurological Surgery RRC Educational Presentation, ACGME, at <http://acgme.org/acgmeweb/ProgramandInstitutionalGuidelines/SurgicalAccreditation/NeurologicalSurgery.aspx>, October, 2012.

'Night float' duty schedule for neurosurgery. Notable educational practice designation, ACGME, at <http://www.acgme.org/acWebsite/notablepractices/default.asp>, February, 2012.

Selden, OHSU healthcare and education blog, May 2012 to present.

Komotar, R., Coppa, N., Connolly, S. and Selden, N.R. (2012) PGY1 Boot Camp Operative Skills Stations Video Modules (Six 5 minute video modules), at [www.societyns.org](http://www.societyns.org).

Komotar, R., Connolly, S., Selden, N.R. and the Subcommittee on PGY1 Boot Camp Courses, Society of Neurological Surgeons (2011) PGY1 Boot Camp Lecture Video Modules (Nine 30 minute lectures), at [www.societyns.org](http://www.societyns.org).

Stem Cells and Central Nervous System Therapeutics, March/April 2008, Podcast, Interview by Dr. Nathan Selden, topic editor, of Dr. Ole Isacson, Director of the Center for Neuroregeneration Research, Harvard University, at [www.thejns.org](http://www.thejns.org) *Neurosurgery Focus*.

Selden, N.R. (2008) Patient Research: Your Obligation to the Patient. Society of Neurological Surgeons-American Association of Neurological Surgeons, Neurosurgical Online Educational Sessions, at [www.aans.org](http://www.aans.org)

Selden, N.R. (2008) Evaluation of CSF Shunt Malfunction. Society of Neurological Surgeons-American Association of Neurological Surgeons, Neurosurgical Online Educational Sessions, at [www.aans.org](http://www.aans.org)

Selden, N.R. (2007) Editor, SANS: Lifelong Learning, Competencies (Module editor: Alan Scarrow).

Selden, N.R. (2007) Editor, Program Director's Toolkit, Society of Neurological Surgeons website at [www.societyns.org](http://www.societyns.org).

Selden, N.R. (2006) SANS: *Lifelong Learning* (Self Assessment in Neurological Surgery, and Lifelong Learning and Self-Assessment requirement of the American Board of Neurological Surgery, Maintenance of Certification). Editor; Section Editor: Core Competencies; Co-Section Editor: Pediatrics.

Selden, N.R. (2004) *SANSWired* (Self Assessment in Neurological Surgery, 7<sup>th</sup> Ed.), Associate Editor, Pediatric section Editor, Pediatric and Neuroscience Section Contributor; at [www.sanswired.com](http://www.sanswired.com).

Novel device for endoscope targeting. Digital video. At [www.karger.com](http://www.karger.com). (*Pediatric Neurosurgery*).

## Reviews

See chapters.

## Abstracts

Selden, N.R. (2015) Intentional Education: Reform of US Residency Training. *Abstract, 35 Annual Meeting of the Japanese Congress of Neurological Surgeons, Tokyo, Japan.*

Bergquist, C.S., Nauta, A.C, Selden, N.R., and Kuang, A.K. (2015) Age at the time of surgery and maintenance of head size in non-syndromic sagittal craniosynostosis. *16<sup>th</sup> Biennial Congress of the International Society of Craniofacial Surgery, Tokyo, Japan, September 2015, submitted.*

Strong, M.J., Thompson, E.M., Roundy, N., and Selden, N.R. (2015) Use of lumbar laminoplasty vs. laminotomy for transection of the filum terminale does not affect complication rate or post-operative course. *Submitted, AANS annual meeting, Washington, DC.*

Selden, N.R. and Andersen, P. (2015) Recurrent CSF leak after endoscopic transnasal resection of craniopharyngiomas. *American Society of Pediatric Neurosurgeons, Kona, Hawaii, January 2015.*

Fichadia, H., Selden, N.R., and Kuang, A.A. (2015) A series of eleven patients with cleft lip/palate and craniosynostosis. *Proceedings of the Northwest Society of Plastic Surgeons Annual Meeting, Kona, Hawaii, February 2015.*

Hoh, B.L., Ullman, J.S., Bendok, B.R., Rao, G., Selden, N.R., Resnick, D.K., and Ghohawala, Z. (2014) The comparative effectiveness of specific professional educational tools for correcting knowledge gaps among practicing neurosurgeons. *Congress of Neurological Surgeons Annual Meeting, Boston, Massachusetts.*

Martin, DT, Diggs, B., Gries, H., Koh, J., Schreiber, M., Selden, N., and Kuang, A. (2015) Implementation of tranexemic acid to reduce blood loss during cranial vault remodeling for craniosynostosis at a single institution. *Proceedings of the 72<sup>nd</sup> Annual Meeting of the American Cleft Palate-Craniofacial Association, April, 2015.*

Martin, DT, Gries, H, Diggs, J, Koh, J, Selden, NR, Schreiber, M, and Kuang, AA (2014) The implementation of tranexamic acid to reduce blood loss during cranial vault remodeling for craniosynostosis at a single institution. *Plastic and Reconstructive Surgery* 2014 Oct;134(4 Suppl 1):22. doi: 10.1097/01.prs.0000455342.16278.23. *Proceedings of the American Society of Plastic Surgery, October, 2014.*

Selden, N., Waldo, H., Abosch, A., Byrne, R., Harbaugh, R., Krauss, W., Mapstone, T., Sagher, O., Zipfel, G., Derstine, P., Batjer, H. (2014) Neurological surgery milestones-compatible evaluations system. *Annual Meeting of the Accreditation Council of Graduate Medical Education, Washington, DC, March 2014.*

Weber, T., Takeyama, E., Ganju, A., Zipfel, G., Barbaro, N., Gallagher, M., Selden, N. and Waldo, H. (2014) Resident assessment using neurosurgery milestones in common residency management systems. *Digital Poster, Annual Meeting of the American Association of Neurological Surgery, San Francisco, California, April 2014.*

Thompson, E.M., Baird, L.C., and Selden, N.R. (2013) Results of a North American survey for quick brain MRI utilization to evaluate cerebral ventricles in children. *AANS Annual Meeting, San Francisco, California, April 2014, digital poster.*

Selden, N.R. Bergquist, C., Crupi, L., Oliverio, M., and Kuang, A.A. (2014) Effectiveness and safety of independent pediatric nurse practitioners in evaluating plagiocephaly, *Proceedings of the American Association of Neurological Surgeons, Annual Meeting, San Francisco, CA, April 2015.*

Thompson, E.M., Wagner, K., Kronfeld, K., Baird, L.C., and Selden, N.R. (2013) Using a two variable method in radionuclide shuntography to predict shunt patency. *Proceedings of the AANS-CNS Section on Pediatric Neurological Surgery Annual Meeting, December 2013.*

Selden, N.R., Yue, E.L, Meckler, G.D., Fleischman, R., Bardo, D.M.E., Chu, A., Vu, E., and Spiro, D.M. (2013) Test characteristics of Quick-brain MRI for shunt evaluation in children, *AANS-CNS Section for Pediatric Neurological Surgery Annual Meeting, December 2013, Toronto, Canada.*

Berquist, C., Selden, N.R., Nauta, A., and Kuang, A.A. (2013) Age at time of surgery and maintenance of head size in nonsyndromic sagittal synostosis. *Proceedings of the Annual meeting of the American Cleft Palate-Craniofacial Association, Indianapolis, IN, March 2014.*

Esmonde, N., Christian, B., Crupi, L., Oliverio, M., Selden, N., Bardo, D., Koh, J. and Kuang, A. (2013), Implementation of a 'feed and swaddle' protocol to minimize need for sedation in computed tomographic imaging. *Proceedings of the Annual Meeting of the Northwest Society of Plastic Surgeons, March 2014.*

Selden, N.R., Al-Uzri, A., Steiner, R., and Huhn, S. (2013) Neural stem cell transplantation for neuronal ceroid lipofuscinoses: Long-term follow-up results of phase I study. *Academy of Neurological Surgery, Newport Beach, CA, September, 2013.*

Selden, N.R., Al-Uzri, A., Steiner, R., and Huhn, S. (2013) CNS Stem cell transplantation for neuronal ceroid lipofuscinoses: Summary of long term follow-up results. *Congress of Neurological Surgeons 2013 Annual Meeting, October 2013, San Francisco, California.*

Yue, E.L., Meckler, G.D., Fleischman, R., Selden, N.R., and Bardo, D.M.E. (2013) Test characteristics of Quick-brain MRI for shunt evaluation in children: A new modality to avoid unnecessary radiation. *Accepted, American Academy of Pediatrics National Conference and Exhibition, Section on Emergency Medicine (Abstracts I), October 25, 2013, Orlando, Florida.*

Cagley, J., Rogers, S., Figi, A., Selden, N. and Pollock, J (2013) Imaging of dermal sinus tracts in children. *American Society of Neuroradiology*.

Figi A, Cagley J, Selden N, Pollock JM. Dermal Sinus Tracts: A Pictorial Review, *American Society of Spine Radiology*. Scottsdale, AZ, 2013.

Kuang, A.A., Jenq, T.J., Didier, R., Moneta, L., Bardo, D., and Selden, N.R. (2013) Benign radiographic coronal synostosis after sagittal synostosis repair. *Proceedings of the International Conference of Craniofacial Surgery, Journal of Craniofacial Surgery*.

Zarella, C., Didier, R., Bardo, D., Selden, N.R., and Kuang, A.A. (2013) Radiation reduction protocol effectively reduces radiation exposure during CT evaluation of pediatric craniofacial anomalies. *Proceedings of the International Conference of Craniofacial Surgery, Journal of Craniofacial Surgery*.

Selden, N.R., Didier, R., Bardo, D., Zarella, C. and Kuang, A.A. (2013) Benign secondary radiographic coronal synostosis after sagittal synostosis repair. *Proceedings of the American Society of Pediatric Neurosurgery 2013 Annual Meeting, Kauai, Hawaii, Journal of Neurosurgery:Pediatrics*, 11(3)A365-66.

Thompson, E., Selden, N.R. (2012) The importance of radiographic fatty film in the diagnosis of tethered cord syndrome. *AANS-CNS Joint Section for Pediatric Neurological Surgery Annual Meeting, St. Louis, Missouri, November 2012*.

Piedra, M., Ragel, B., Klimo, P. and Selden, N.R. (2012) Reduction of ACGME resident work hour violations with 3-person night float system without change in operative caseload. *Congress of Neurological Surgeons Annual Meeting, October, 2012 (submitted)*.

Selden, N., Neural stem cell transplantation in children for neurodegenerative disorders. *Proceedings of the Central European Neurosurgical Society, Prague, Czech Republic, June, 2012*.

Piedra, M., Thompson, E., Selden, N.R., and Guillaume, D. (2012) Early cranioplasty reduces the risk of bone resorption after decompressive craniectomy in children. 2012 AANS Pediatric Section Oral Presentations.

Selden, NR, Origitano, TC, Burchiel, KJ, Getch, CG, Anderson, VC, and Barbaro, NM (2011) National neurosurgical boot camp courses for PGY1 residents. 2011 AANS Annual Meeting (Plenary Session II).

Jacobs, Y., Selden, N., Al-Uzri, A., Koch, T., Vogel, H., Huhn, S., Uchida, N., Dalma-Weiszhaus, D., Tsukamoto, A., and Steiner, R. (2011) Long-term survival and migration of allogenic human central nervous system stem cells following intracerebral transplantation in neuronal ceroid lipofuscinosis. *International Society for Stem Cell Research*.

Selden, N.R. Al-Uzri, A., Koch, T., Steiner, R. and Huhn, S. (2011) CNS stem cell transplantation for neuronal ceroid lipofuscinosis: Clinical trial results. *American Society of Pediatric Neurosurgery, Journal of Neurosurgery:Pediatrics*:7(3)A320.

Kuang, A.A., Jenq, T., Didier, R., Bardo, D., and Selden, N.R. (2011) Benign radiographic coronal synostosis after sagittal synostosis repair. *International Society for Craniofacial Surgery Annual Meeting, 2011*.

- Piedra, M., Selden, N.R., and Ragel, B. (2011) Analysis of resident work force strategies to accommodate the July 1, 2011 ACGME resident duty hour standards. *Congress of Neurological Surgeons Annual Meeting, September, 2011.*
- Wozniak, S., Thompson, E., and Selden, N.R. (2011) Vagal nerve stimulator infection: Lead salvage protocol. *Congress of Neurological Surgeons Annual Meeting, September, 2011.*
- Thompson, E., Wozniak, S., and Selden, N.R. (2011) Vagal nerve stimulation for partial and generalized epilepsy from infancy to adolescence. *Congress of Neurological Surgeons Annual Meeting, September, 2011.*
- Jacobs, Y., Selden, N., Al-Uzri, A., Koch, T., Vogel, H., Huhn, S., Uchida, N., Dalma-Weiszhausz, D., Tsukamoto, A., and Steiner, R. (2011) Long-term survival and migration of allogenic human central nervous system stem cells following intracerebral transplantation in neuronal ceroid lipofuscinosis. *International Society for Stem Cell Research, submitted.*
- Selden, N.R., Didier R.A., Kuang, A.A., Schwartz, D.L., Stevens, D.M., Bardo, D.M.E. (2010) Radiation dose reduction in children undergoing CT imaging for craniofacial surgery. Submitted, AANS/CNS Section on Pediatric Neurological Surgery, December, 2010, Cleveland, OH.
- Dianna M. E. Bardo, Thomas Gibson, Tyler Andrews, Jon Kullnat, Elizabeth Kutella, Ryne Didier, Jeffery M. Pollock, Nathan Selden, Anna A. Kuang. (2010) Craniofacial anomalies: Embryology, Radiographic Diagnosis, Corrective Surgical Procedures, & Postoperative Imaging Findings. Presented at the 96<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiologic Society of North America, November 29-December 3, Chicago, IL
- Dianna M. E. Bardo , Thomas Gibson, Elizabeth Kutella, Tyler Andrews, Jon Kullnat, Ryne Didier, Jeffrey Pollock, Nathan Selden, Anna Kuang. The Tessier Classification of Facial Clefts: Craniofacial CT diagnosis with embryology, clinical & surgical notes. Presented at the 96<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiologic Society of North America, November 29-December3, Chicago, IL.
- Dianna M. E. Bardo, Thomas Gibson, Jon Kullnat, Elizabeth Kutella, Tyler Andrews, Ryne Didier, Jeffery M. Pollock, Nathan Selden, Anna A. Kuang. Syndromic and Non-syndromic Craniosynostosis: Embryology, Radiographic Diagnosis, Corrective Surgical Procedures, & Postoperative Imaging Findings. Presented at the 96<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiologic Society of North America, November 29-December3, Chicago, IL.
- Thompson, E, Anderson, G, and Selden, N (2010) Skull-fixated fiducial markers improve accuracy in two-stage frameless stereotactic epilepsy surgery. *Congress of Neurological Surgeons, Neurosurgical Forum, October 2010.*
- Selden, N and Golshani, K (2010) Modified orbitozygomatic craniotomy for resection of craniopharyngioma in pediatric patients. *Congress of Neurological Surgeons, Neurosurgical Forum, October 2010.*
- Selden, N, Barbaro, N and Burchiel, K (2010) Fundamental skills for neurosurgery interns: Report of a Pacific region 'bootcamp' pilot course, 2009. *Congress of Neurological Surgeons, Neurosurgical Forum, October 2010.*

Robert Steiner, Nathan Selden, Stephen L. Huhn, Thomas Koch, Amira Al-Uzri, Darryn Sikora, Susan Dean, Jennifer Penfield, Trena Sutcliffe, Roland Bammer, Hannes Vogel and Nobuko Uchida (2009) CNS transplantation of purified human neural stem cells in infantile and late-infantile neuronal ceroid lipofuscinoses: Results of the Phase I trial. *Proceedings of the 2009 NCL Meeting, Hamburg, Germany.*

Steiner RD, Huhn SL, Koch T, Al-Uzri A, Guillaume G, Sutcliffe T, Vogel H, Selden N. CNS transplantation of purified human neural stem cells in Infantile and Late-Infantile Neuronal Ceroid Lipofuscinoses: Summary of the Phase I trial. *Mol Gen Metab.* 98: 76., A422, 2009.

Selden, N.R., Golshani, K.J., Delashaw, J.B. and Lalwani, K. (2009) Modified orbitozygomatic craniotomy for craniopharyngioma resection in children. Western Neurosurgical Society, Sunriver Oregon, September, 2009.

Litvack, Z, Lindsay, R and Selden, NR (2009) Dural-splitting decompression for Chiari I malformation: Safety, efficacy and cost-analysis. Congress of Neurological Surgeons 2009 Annual Meeting 'Top Abstracts (Pediatrics)', *Neurosurgery*, 65(2):418-19.

Barker, F.G., Connolly, E.S., Hoh, B.L., Selden, N.R., Asher, A.L., Kondziolka, D., Boulis, N.M. (2009) Community and Individual Equipoise for Ruptured Intracranial Aneurysm Clipping versus Coiling: Results from Integrated Medical Learning (IML). Congress of Neurological Surgeons 2009 Annual Meeting. *Neurosurgery* 65(2): 407.

Litvack, Z, Saedi, T, Cetas, J, Kao, A, and Selden NR (2009) The role of SPECT in determining surgical candidacy in children with epilepsy. Select Abstracts, Congress of Neurological Surgeons 2009 Annual Meeting.

Amira Al-Uzri, Thomas Koch, Nathan Selden, Daniel Guillaume, Sarah Kachan, Ali Olyaei, Stephen Huhn, Robert D. Steiner. Immunosuppression for Human CNS Stem Cell (HuCNS-SC) Transplantation in Neuronal Ceroid Lipofuscinoses-Preliminary Observations. *American Journal of Transplantation* 2009, *supp 2* (9):468. Poster Presentation at American Transplant Congress May 2009.

Selden, NR, Huhn, SL, Guillaume, DJ and Steiner, RD (2009) CNS transplantation of purified human neural stem cells in subjects with infantile and late-infantile neuronal ceroid lipofuscinoses: A phase I trial. Proceedings of the American Society of Pediatric Neurosurgery, 32:55. *Journal of Neurosurgery: Pediatrics*, 3(5):A451-452.

Bardo, D, Didier, R, Anderson, J, Selden, N, Guillaume, D, Klein, A, Pollock, J, Yutan, E, Chang, A, and Kuang, A (2009) Craniofacial CT: Altering patient positioning, radiographic technique and clinical practice to minimize effective radiation dose in children. Proceedings of the American Society of Neuroradiology, 2009.

Barker, F, Connolly, ES, Hoh, BL, Selden, NR, Asher, AL, Kondziolka, D, and Boulis, NM (2008). Clipping versus coiling for ruptured intracranial aneurysms: Integrated medical learning at CNS 2007. Proceedings of the American Academy of Neurological Surgery, 70:86.

Roberts, CM, Roedel, E, Oken, B, and Selden, NR (2008) Motor cortex mapping using subdural electrodes and multichannel EMG recording in pediatric tumor patients. (e-Poster 1030) AANS Annual Meeting, 2008.

Selden, N, Ortiz, J, Close, L and Heinricher (2008)  $\alpha_2$ -Noradrenergic antagonist administration into the central nucleus of the amygdala blocks stress induced analgesia, *Neurosurgery*, 62(6):1427. *Proceedings of the Congress of Neurological Surgeons Annual Meeting, Orlando, Florida, September, 2008.*

Kondziolka, D, Asher, A, Rodts, G, Selden, N (2008) Integrated medical learning: Concepts and outcomes from the 2007 CNS, *Neurosurgery*, 62(6):1400-01. *Proceedings of the Congress of Neurological Surgeons Annual Meeting, Orlando, Florida, September, 2008.*

Sohaey, R, Tredennick, T, Kennedy, A, Oh, K, and Selden, N. (2007) Prenatal ultrasound diagnosis of tethered cord in fetuses without open neural tube defects (OC74). *Ultrasound, Obstetrics & Gynecology*, 30(4):390. PMID 17891762,

Ortiz, J.P., Close, L.N., Heinricher, M.M. and Selden, N.R.  $\alpha_2$ - noradrenergic antagonist administration into the central nucleus of the amygdala blocks stress-induced hypoalgesia in awake behaving rats. *Academy of University Anesthesiologists*, 2008, accepted, winner resident award.

Sohaey, R, Tredennick, T, Kennedy, A, Oh, K, and Selden, N. (2007) Prenatal ultrasound diagnosis of tethered cord in fetuses without open neural tube defects. *Ultrasound Obstet Gynecol.* 2007 Oct; 30(4):390. (*Proceedings of the 16<sup>th</sup> World Congress on Ultrasound in Obstetrics and Gynecology*).

Ortiz, J., Heinricher, M.M., Close, L., and Selden, N. R. (2007) A candidate neural circuit for stress induced analgesia. *Journal of Neurosurgery*, 106(4):A765-6.

ZN Litvack, M.D., JK Liu, M.D., BE Hamilton, M.D., J Falardeau, M.D., DJ Guillaume, M.D. NR Selden, M.D. and JB Delashaw, Jr, M.D. "Delayed Pneumatization of the Sphenoid Sinus Mimicking a Skull Base Mass." *American Association of Neurological Surgeons, Washington, DC, April 14-19, 2007.*

Gubbels, SP, Selden, NR, Delashaw, JB, and McMenomey, SO. Spontaneous middle fossa encephalocele and cerebrospinal fluid leakage: Diagnosis and management. *Proceedings of the American Neurology Society, May 2006.*

Jeffrey J. Iliff, Liesl Close, Nathan R. Selden, Marjorie Grafe, Nabil J. Alkayed (2006) Role Of Soluble Epoxide Hydrolase In Neurovascular Coupling. *American Physiological Society, FASEB, 2007, Accepted.*

Selden, N.R., Abdulrauf, S.I., MacDonald, J.D., and Asher, A.L. (2006) SANSwired: A tool for learning and maintenance of certification. *Proceedings of the Western Neurosurgical Society, 52<sup>nd</sup> Annual Meeting, Blaine Washington.*

Hedges, JR, Newgard, CD, Veum-Stone, J, Selden, NR, Adams, AL, Lenfesty, B, Arthur, M, Mullins, RJ. (2006) Early neurosurgical procedures enhance survival in significant blunt traumatic brain injury. *Acad. Emerg. Med.*, May 2006, V. 13(5) Suppl. 1, p. S11.

Gubbels, SP, Selden, NR, Delashaw, JB, and McMenomey, SO. (2006) Spontaneous middle fossa encephalocele and cerebrospinal fluid leakage: Diagnosis and management.

Tse, H.H., Roberts, C., Gultekin, H., Selden, N.R. (2006) Serial MRI may reveal focal cortical dysplasia in infants with intractable partial epilepsy. *Proceedings of the AANS Annual Meeting, San Francisco, CA.*

- Selden, N., Abdulrauf, S.I., Asher, A.L., MacDonald, J.D., and Rodts, G.E. (2006) SANSwired: A tool for education and certification. *Journal of Neurosurgery: Pediatrics*, 104:A220.
- Ragel, B.T., Asher, A.L., Selden, N.R., MacDonald, J.D., Self-Assessment in Neurological Surgery (SANS): The SANS Wired White Paper, 32nd Annual Richard Lende Winter Neurosurgery Conference. February 3 - 8, 2005, Snowbird, Utah.
- SH Gultekin, M. Grafe, N. Selden, A. West. Pilomyxoid Morphology In Glioneuronal Tumors. *Submitted*.
- Selden, N.R., Carlson, J., and Heinricher, M.M. (2005) Medullary pain modulating neurons: Purinergic control. American Society of Pediatric Neurosurgery, January, 2005. *Journal of Neurosurgery (Pediatrics)*, Volume 103:A108, 2005.
- Selden, N.R., Siler, L.N., Close, L.N. and Heinricher, M.M. (2004) Purinergic control of medullary pain modulating neurons. *Society for Neuroscience Abstracts*, 34:296.2.
- Carlson, J.D., Burchiel, K.J., Selden, N.R., and Heinricher, M.H. (2004) The mesopontine tegmentum, a new pain modulatory region. *Neurosurgery* 55(2):749.
- Selden, N.R. (2004). The Cutting Edge: Technology in Pediatric Surgical Neuro-oncology. *Proceedings of the 10<sup>th</sup> Annual Meeting, Frontiers in Translational Research in Neuro-oncology and the Blood-Brain Barrier*, 10:14.
- Selden, NR, Limonadi, F, Durham, S (2003) Dural splitting craniocervical decompression: Reduced operative time, hospital stay and cost with equivalent early outcome. *Proceedings of the 32<sup>nd</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery*, 32:42.
- Liu, KC, Selden, NR, Durham, SR (2003) Utility of serial computed tomography scans in pediatric head trauma. *Proceedings of the 32<sup>nd</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery*, 32:27.
- Hunt, M, Selden, NR, Durham, SR (2003) Skiing and snowboarding head injury: Why are had injuries more common in snowboarders? *Proceedings of the 32<sup>nd</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery*, 32:28.
- Selden, N (2003) Purinergic mechanisms of medullary pain modulation. *Proceedings of the NICHD Child Health Research Centers Annual Meeting*, 50-51.
- Stephan, MJ, Nesbit, GM, Selden, NR, Behrens, ML, Whitaker, MA, Barnwell. Successful endovascular treatment of spinal canal arteriovenous fistula in a young child with hereditary hemorrhagic telangiectasia. (2003) *Proceedings of the 24<sup>th</sup> Annual David W. Smith Workshop on Malformations and Morphogenesis*.
- Selden, NR, Allen, S, Sandquist, M, and Piatt, JHP. Isolated lumbosacral strawberry nevi do not indicate the presence of occult spinal dysraphism, (2002). *Proceedings of the Joint Section on Pediatric Neurological Surgery*, 31:42.
- Sandquist, MA. and Selden, N.R. A single pass technique for CSF shunting procedures, (2002). *Proceedings of the Joint Section on Pediatric Neurological Surgery*, 31:61.



Selden, N.R., Adelson, D., Bratton, S., Carney, N., Chesnut, R., duCoudray, H., Goldstein, B., Kochanek, P., Miller, H., and Partington, M. (2001). Guidelines for the Management of Severe Head Injury in Children: Update. *Proceedings of the Joint Section on Pediatric Neurological Surgery*, 30:75.

Selden, N., Gitelman, D. and Mesulam, M. (1999). Trajectories of cholinergic pathways within the cerebral hemispheres of the human brain. *Child's Nervous System*. 15(8):420.

Geer, C., Selden, N.R. and Papadopoulos, S.M. (1999) Anterior cervical plate fixation in the treatment of single-level cervical disc disease. *Journal of Neurosurgery*, 90:410A.

Geer, C., Selden, N.R. and Papadopoulos, S.M. (1999) Analysis of anterior cervical plate fixation in the treatment of single level cervical disc disease. *Proceedings of the Section on Disorders of the Spine and Peripheral Nerves*, 12:82.

Selden N.R., Gitelman, D.R. and Mesulam, M.-M. (1998) Trajectories of corticopetal cholinergic pathways within the cerebral hemispheres of the human brain. *NeuroImage* 7(4):S26.

Selden, N., Patel, N., Grube, S. and Papadopoulos, S. (1998) Improved outcome and reduced cost in cervical spinal cord injury using emergency MRI and surgical decompression. *Journal of Neurosurgery*, 88:393A.

Selden, N., Patel, N., Grube, S., and Papadopoulos, S. (1997) Emergent MRI and surgical decompression improves outcome and reduces cost in spinal cord injury. *Proceedings of the Congress of Neurological Surgeons*, 47:726.

Selden, N., Geula, C., and Mesulam, M.-M. (1993) Distribution of neurofibrillary tangles in Alzheimer's disease striatum. *Society for Neuroscience Abstracts*, 19:423.13.

Selden, N., Geula, C., Hersh, L. and Mesulam, M-M. (1991) Chemoarchitecture of the striatum in Alzheimer's disease. *Society for Neuroscience Abstracts*, 17:272.13.

Selden, N., Geula, C. and Mesulam, M-M. (1990) Human caudate and putamen chemoarchitecture. *Society for Neuroscience Abstracts*, 16:505.1.

Selden, N.R.W., Everitt, B.J. and Robbins, T.W. (1989) Catecholaminergic deafferentation or cell body lesions of the amygdala impair fear conditioning to explicit but not contextual cues. *Society for Neuroscience Abstracts*, 15:490.14.

Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1989) Ceruleo-cortical noradrenaline depletion improves spatially cued but impairs locally cued water maze acquisition: implications for an attentional theory of noradrenergic function. *Journal of Psychopharmacology*, 3(4):48P.

Selden, N.R.W., Jarrard, L.E., Everitt, B.J. and Robbins, T.W. (1989) A double dissociation of the effects of amygdala and hippocampal damage on fear conditioning to explicit and contextual cues. *Journal of Psychopharmacology*, 3(4):14P.

Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1988) Enhanced behavioural conditioning to context but unchanged corticosterone response in noradrenaline depleted rats. *Society for Neuroscience Abstracts*, 14:288.12.

Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1988) Noradrenaline depletion protects against a stress-induced impairment of spatial learning. *Psychopharmacology*, 96(1):S52.

Selden, N.R.W., Robbins, T.W. and Everitt, B.J. (1988) The interaction of cold water stress and forebrain noradrenaline in a spatial learning task. *Neuroscience Letters*, Supplement 32, S43.

### Other

Patents under review. Selden, N.R. (2004 and 2010). Interfascial stent and method of maintaining patency of surgical fenestrations.

Published articles in:

- *Washington Post* (Washington, D.C.)
- *Willamette Week* (Portland, Oregon)
- *Downtowner* (Portland, Oregon)
- *Stanford Daily* (Stanford, California)

### **Invited Lectures, Conference Presentations or Professorships:**

#### International and National

Graduation Day Visiting Professor, Rush University Department of Neurosurgery, Chicago, IL, June 2015.

Intentional Education: Reform of US Residency Training. Japanese Congress of Neurological Surgeons, Tokyo, Japan, May 2015. (*Presidential Address for the Congress of Neurological Surgeons*).

CNS Stem Cell Therapy in Patients. American Association of Neurological Surgeons Breakfast Seminar, Washington, DC, May 2015.

CNS Presidential Message, American Association of Neurological Surgeons, General Scientific Session II, Washington, DC, May 2015.

CNS Presidential Update, U.S. Council for State Neurosurgical Societies, Washington, DC, May 2015.

Neurosurgical Education in an Outcomes Era, Turkish Neurosurgical Society Annual Meeting, Antalya Turkey, April 2015.

Pediatric Neurovascular Syndromes, International Basic Neurosurgery Course, Antalya Turkey, April 2015.

Moya Moya Disease, International Basic Neurosurgery Course, Antalya Turkey, April 2015.

Guidelines Defend Access and Improve Quality. Scientific Session IV, AANS-CNS Joint Section on Disorders of the Spine and Peripheral Nerves, March 2014, Phoenix, Arizona.

Paradigm Shift in US Residency Training: Education Science and Outcomes. Neurosurgical Society of India 2014 Annual Meeting, Coimbatore, India (*Presidential Address for the Congress of Neurological Surgeons*).

Diagnostic Boundaries in Minor Spinal Dysraphism: A Cautionary Tale. Visiting Professor, Washington University St. Louis, November 2014.

Intentional Education: Assessment and Outcomes. Visiting Professor, Washington University St. Louis, November 2014.

Milestones Update and a Look at the Data, SNS-CNS Program Director and Coordinators' Workshop, CNS Annual Meeting, Boston, MA, October, 2014.

Ask the Experts: Families of Teens with Hydrocephalus, 2014 National Conference on Hydrocephalus, Hydrocephalus Association, July, Portland, Oregon.

Neuro-imaging: Radiation Exposure and Quick Brain MRIs, 2014 National Conference on Hydrocephalus, Hydrocephalus Association, July, Portland, Oregon.

A New Paradigm for Neurosurgical Training: Intentional Learning & Outcomes Management, Honored Guest Lecture, Michigan Association of Neurological Surgeons (MANS), 2014 Annual Meeting, Crystal Mountain, Michigan, May 2014.

Long Term Outcomes of the First Phase I Clinical Trial of Neural Stem Cell Transplantation, Honored Guest Lecture, Michigan Association of Neurological Surgeons (MANS), 2014 Annual Meeting, Crystal Mountain, Michigan, May 2014.

Milestones Pilot Group Update and Data Collection Automation, Society of Neurological Surgeons Annual Meeting, Rochester, Minnesota, May 2014.

Streamlining Organized Neurosurgery, address and panel discussion with leadership of SNS, CNS, AANS and ABNS, Society of Neurological Surgeons Annual Meeting, Rochester, Minnesota, May 2014.

Neural Stem Cell Transplantation for CNS Degenerative Disease, Breakfast Seminar, American Association of Neurological Surgeons 2013 Annual Meeting, April 2014.

Thick filum terminale and filum terminale lipoma, Invited International Lecturer, International Basic Neurosurgery Course, Term I, Course III, Antalya, Turkey, March 2014.

Lipomyelomeningocele, Invited International Lecturer, International Basic Neurosurgery Course, Term I, Course III, Antalya, Turkey, March 2014.

Surgical anatomy, positions and surgical approaches: Posterior cervical and cervico-thoracic junction, Invited International Lecturer, International Basic Neurosurgery Course, Term I, Course III, Antalya, Turkey, March 2014.

The science of neurosurgical education, Invited International Lecturer, International Basic Neurosurgery Course, Term I, Course III, Antalya, Turkey, March 2014.

Neural Stem Cell Transplantation in Neurodegenerative Disease, Visiting Professor, University of Florida, Department of Neurological Surgery, Gainesville Florida, February 2014.

Tethered Spinal Cord: Clinical Findings, Diagnostic Boundaries and Surgical Outcomes, Visiting Professor, University of Florida, Department of Neurological Surgery, Gainesville Florida, February 2014.

Phase I Trial of CNS Neural Stem Cell Transplantation in Children: Challenges, Strategies and Results, Visiting Professor, Carolinas Medical Center, Charlotte, North Carolina, September, 2013.

A New Outcomes Era in Residency Training: Assessment and Milestones, Visiting Professor, Carolinas Medical Center, Charlotte, North Carolina, September, 2013.

Getting into Neurosurgery Residency - Tips & Pitfalls, PC4 "So You Want to Be A Neurosurgeon", Congress of Neurological Surgeons Annual Meeting, October 2013, San Francisco, CA.

Neurosurgical Milestones Evaluation and Reporting for Program Directors and Coordinators, in Practical Course 13, RRC Next Accreditation System, Milestones and Matrix Curriculum, Congress of Neurological Surgeons Annual Meeting, October 2013, San Francisco, CA.

Hydrocephalus Emergencies, Society of Neurological Surgeons Western Region Boot Camp Course, Portland, OR, July 2013.

SNS Matrix Curriculum, Evaluation Tools, and the Online Learning and Portfolio SNS Platform: How Does it All Fit Together? Society of Neurological Surgeons Annual Meeting (Program Directors and Coordinators Symposium), June 2013, Boston Massachusetts.

Mock Clinical Competency Committee Workshop, Society of Neurological Surgeons Annual Meeting (Program Directors and Coordinators Symposium), June 2013, Boston Massachusetts.

Milestones and Clinical Competency Committees, Society of Neurological Surgeons Annual Meeting, June 2013, Boston Massachusetts.

Neurosurgery Boot Camp I, Society of Neurological Surgeons Annual Meeting, June 2013, Boston Massachusetts.

Breaking Bad News, Society of Neurological Surgeons Junior Resident Boot Camp, San Diego, CA (Western Region), May 2013.

Informed Consent, Society of Neurological Surgeons Junior Resident Boot Camp, San Diego, CA (Western Region), May 2013.

Neurosurgery Milestones Adoption, ACGME Webinar, May 22<sup>nd</sup>, 2013.

2013 Invited Lecturer, AANS Young Neurosurgeon's Luncheon, 2013 Annual Meeting, New Orleans, Louisiana.

CNS Transplantation for Batten's Disease, Breakfast Seminar, American Association of Neurological Surgeons 2013 Annual Meeting, April 2013.

CNS Neural Stem Cell Transplantation in Children, Visiting Professor, Departments of Neurological Surgery and Neurology, Stanford University Medical Center, Stanford, CA, April 2013.

Boot Camps for Teaching Neurosurgical Milestones, Education Seminar, 2013 Annual Meeting of the American Society of Pediatric Neurosurgeons, Kauai, Hawaii, February, 2013.

Building a Career in Academic Pediatric Neurosurgery, Breakfast Seminar, 2013 Annual Meeting of the AANS-CNS Joint Section on Pediatric Neurological Surgery, December, 2012.

Guidelines for Pediatric Traumatic Brain Injury, CNS Trauma Guidelines Webinar, November 6<sup>th</sup>, 2012.

Implementing milestones verification for neurosurgical residents. CNS-ACGME Practical Course, Congress of Neurological Surgeons Annual Meeting, October 2012, Chicago, IL.

Therapeutic stem cells. Second International Meeting of the Society for CNS Interstitial Delivery of Therapeutics, October 6<sup>th</sup>, 2012, Chicago, Illinois.

Pediatric traumatic brain injury guidelines. Luncheon seminar, Congress of Neurological Surgeons Annual Meeting, October 2012, Chicago, IL.

Neural stem cell transplantation in children for neurodegenerative disorders. Central European Neurosurgical Society, Prague, Czech Republic, June, 2012.

Pediatric TBI Guidelines, CNS Webinar Faculty: Guidelines for the Management of Severe TBI, June 8<sup>th</sup>, 2012.

A duty hours compliant night float system for neurosurgery programs, Society of Neurological Surgeons, Atlanta, Georgia, May, 2012.

Boot Camp Courses: Junior Resident Course Development, Society of Neurological Surgeons, Atlanta, Georgia, May, 2012.

The science of clinical practice: Education, AANS Practical Course on Clinical Data Registries, Miami Florida, April 2012.

Translating a novel therapeutic strategy and agent in a pediatric surgical trial: CNS transplant of neural stem cells for Batten's disease. Seminars in Translational Science Research, DuPont Hospital, Wilmington, Delaware, March 2012.

Visiting Professor, Jefferson Medical College Department of Neurological Surgery, March 2012. *Neural Stem Cells: Translational Trial in Batten's Disease, NCL 1 and 2.*

The Development of Neurosurgical Boot Camp Courses in the United States; and Work-up of the CSF Shunt, an invited introductory lecture for the first Pakistan Neurosurgery Trainee Boot Camp, February 23, 2012 (by Skype).

Visiting Professor, University of California, San Diego, Medical Center, Department of Neurological Surgery, October, 2011. Central Nervous System Transplantation of Neural Stem Cells.

CNS stem cell transplantation in children. Department of Neurological Surgery. Children's Hospital Boston, June 2011.

Neurosurgery Boot camps for residents: A report to the Society of Neurological Surgeons, Society of Neurological Surgeons Annual Meeting, Portland, Oregon, May, 2011.

Pediatric Neurosurgery (Host Program), Society of Neurological Surgeons Annual Meeting, Portland, Oregon, May, 2011.

Residency Program (Host Program), Society of Neurological Surgeons Annual Meeting, Portland, Oregon, May, 2011.

Introduction, Program Directors' Boot camp, Simulation in neurosurgical residency education practical course, Society of Neurological Surgeons Annual Meeting, Portland, Oregon, May, 2011.

Professionalism, fundamental skills, and safety: Outcomes of the 2010 Neurosurgery PGY-1 Bootcamp courses, AANS 2011 Annual Meeting, Plenary Session II, April, 2011.

Professionalism, fundamental skills, and safety: Outcomes of the 2010 Neurosurgery PGY-1 Bootcamp courses, ACGME 2011 National Annual GME Conference, Nashville, TN, March 2011.

Simulation, structured learning, and skill based promotion: The future of neurosurgical residency training. Interurban Neurosurgical Society, Chicago, Ill, March, 2011.

Hydrocephalus: Theory, diagnosis and management across the life span. Association of Neurosurgical Physician Assistants, (Joint Meeting with the Congress of Neurological Surgeons), San Francisco, CA, October 2010.

Big heads, little kids: Hydrocephalus, shunts and ventricles. American Academy of Pediatrics, 2010 National Conference & Exhibition (Meet the expert session), San Francisco, California, October, 2010.

Misshapen heads: Is it cranial synostosis? American Academy of Pediatrics, 2010 National Conference & Exhibition (Meet the expert session), San Francisco, California, October, 2010.

Professionalism, Supervision and Pearls for the Junior Resident. Society of Neurological Surgeons PGY1 Bootcamp Course, Western Region, July 2010, Portland, Oregon.

Neural stem cells and human therapeutics: Report of the first clinical trial. Visiting Professor. Department of Neurosurgery, LSU Health Sciences Center, Shreveport, Louisiana, June, 2010.

Neurosurgery Intern 'Bootcamp'. Society of Neurological Surgeons ('Senior Society'), Annual Meeting, Yale, Connecticut, June 2010.

Program Director's Toolkit (Lecture for Neurosurgery Residency Program Directors Training Session). Society of Neurological Surgeons ('Senior Society'), Annual Meeting, Yale, Connecticut, June 2010.

Neuronal stem cell transplantation for neuronal ceroid lipofuscinosis. General Scientific Session I, American Association of Neurological Surgeons, May 2010.

Practical, ethical, and regulatory challenges to the advance of stem cell research for central nervous system disease. Breakfast seminar on Stem Cell Transplantation, American Association of Neurological Surgeons, May 2010.

Expert Commentary for: Neural stem cells exist within the cerebrospinal fluid of the adult human CNS. Scientific Session III (Stereotactic and Functional), American Association of Neurological Surgeons, May 2010.

PGY1 Bootcamp courses for neurosurgery residents. Neurosurgical Summit, Philadelphia, PA, May 2010.

Teaching for Effect: Educational Outcomes. Meeting of the SNS Task Force on Resident Education, Salt Lake City, Utah, May, 2009.

Stress Induced Analgesia: Can We Hijack Adaptation? Invited presentation, AANS/CNS Joint Section for Pain Surgery, Seminar, AANS Annual Meeting, San Diego, CA, May, 2009.

Minimal Tethered Cord Syndrome, Breakfast Seminar, AANS Annual Meeting, San Diego, CA, May, 2009.

Neuronal Stem Cell Transplantation for CNS Metabolic Disease, Breakfast Seminar, AANS Annual Meeting, San Diego, CA, May, 2009.

Stem Cell Applications in Pediatric Neurosurgery: Current Innovations and Controversies, AANS/CNS Joint Section for Pediatric Neurosurgery, Annual Meeting, Spokane, WA, December, 2008.

Neuronal Stem Cells and Human Therapeutics, University of Michigan Medical Center, *Visiting Professorship*, November, 2008.

Tethered Cord: Slippery Slope? University Alabama Birmingham Medical Center, *Visiting Professorship*, October, 2008.

Neuronal Stem Cells and Human Therapeutics, University Alabama Birmingham Medical Center, *Visiting Professorship*, October, 2008.

Introduction of Dr. Anthony Asher, 58<sup>th</sup> President of the Congress of Neurological Surgeons, General Scientific Session I, Orlando, Florida, September, 2008.

Creating a Community of Learning: Educational Science at the Annual Meeting, General Scientific Session I, Orlando, Florida, September, 2008.

Stress and Pain Modulation, University of Michigan Medical Center, Annual Hoff Scientific Symposium, July, 2008.

Tethered Spinal Cord. Phoenix Children's Hospital, Phoenix, Arizona. *Visiting Professorship*, June, 2008.

Residency Data Collection and the SNS Website. May, 2008, Society of Neurological Surgeons, Madison, Wisc.

Digital Surgical Education. April 2008, American Association of Neurological Surgeons Annual Meeting, Washington, D.C., Practical Course Faculty.

Controversies in Tethered Cord Syndrome. April 2008, American Association of Neurological Surgeons Annual Meeting, Washington, D.C., Breakfast Seminar Faculty.

Minimal Tethered Cord Syndrome. October 2007, American Academy of Pediatrics National Annual Meeting, San Francisco California, Seminar Faculty.

Neurosurgical Lumps, Bumps, Pits and Tracts. October 2007, American Academy of Pediatrics National Annual Meeting, San Francisco California, Seminar Faculty.

Making the Most of MOC, Congress of Neurological Surgeons Annual Meeting, Socioeconomic Practical Course: Part III: Neurosurgical Education, San Diego, September, 2007.

Continuing Medical Education: Meeting as Workshop, Congress of Neurological Surgeons Annual Meeting, Consensus Session on Medical Education, San Diego, September, 2007.

Introduction to Integrated Medical Learning, Congress of Neurological Surgeons Annual Meeting, General Scientific Session III, September, 2007.

Web based technology support for neurosurgery residency redesign, Neurosurgery Education Summit, July 2007, Washington, D.C.

A toolbox for Program Directors. May, 2007. Society of Neurological Surgeons (Senior Society), San Francisco, California.

Controversies in Tethered Cord Syndrome. April 2007, American Association of Neurological Surgeons Annual Meeting, Washington, D.C., Breakfast Seminar Faculty.

Digital Surgical Education. April 2007, American Association of Neurological Surgeons Annual Meeting, Washington, D.C., Practical Course Faculty.

The Competencies: New Paradigms in Surgical Education, January, 2007, University of Virginia Department of Neurological Surgery, Charlottesville, Virginia, *Visiting Professorship, January, 2007.*

Iskandar, B.J. and Selden, N.R. (2007) Task Force Report on Spinal Dysraphism. American Society of Pediatric Neurosurgeons, January, 2006.

A Candidate Circuit for Stress Induced Analgesia, University of Michigan Medical Center, December 15<sup>th</sup>, 2006.

Discussant (2): "Is multifocal seizure resection in children reasonable?" and "Surgical targeting and focal implantation of gene therapy for global neurologic disease: operative techniques and nuances", Congress of Neurological Surgeons Annual Meeting, Neurosurgical Forum, Chicago, IL, October, 2006.

Selden, N.R. (2006) Technical considerations in extradural Chiari decompression. *Digital Video Theater Presentation, Congress of Neurological Surgeons Annual Meeting, Chicago, Ill.*

The Non-Clinical Core Competencies: Their Relevance to Patient Safety. September 12<sup>th</sup>, 2006, Congress of Neurological Surgeons Annual Meeting, Chicago Ill., General Scientific Session IV.



Practice, Science and Evidence in Minimal Tethered Cord Syndrome. Festschrift for Dr. Jonathan McGillicuddy, MD, University of Michigan Medical Center, August, 2006.

Pain Modulating Neurons in the Medulla. Festschrift for Dr. Julian T. Hoff, MD, University of Michigan Medical Center, July, 2005.

Pain Modulating Neurons in the Medulla: Purinergic Control. 28<sup>th</sup> Annual Meeting of the American Association of Pediatric Neurosurgery, Maui, Hawaii, January, 2005.

Controversies in Tethered Spinal Cord Surgery: The Case for Surgery. 33<sup>rd</sup> Annual Meeting of the AANS/CNS Section of Pediatric Neurological Surgery, San Francisco, December, 2004.

Trajectories of cholinergic pathways within the human cerebral hemisphere. American Academy of Neurological Surgery, Santa Barbara, California, 1998.

The anatomy and function of association cortex. Neuroanatomy Course for Nursing Associates, Congress of Neurological Surgeons, Montreal, Canada, 1996.

Functions of the ceruleo-cortical noradrenergic projection. Psychopharmacology Section, Neuroscience Department, Scripps Research Institute, La Jolla, California, 1989.

Behavioral and endocrine functions of forebrain noradrenergic projections in the rat. INSERM unit for the Psychobiology of Adaptive Behavior, University of Bordeaux, France, 1989.

### Regional and Local

The Neurological Examination, Clinical Neuroscience on the Coast CME Course, Salishan, Oregon, September, 2014.

Neurological Examination Demonstration, Clinical Neuroscience on the Coast CME Course, Salishan, Oregon, September, 2014.

National Agenda for Protocol Driven Care in Neurosurgery, OHSU Traumatic Brain Injury Consortium Symposium, May 2014.

Light and Space: Evolving Neurosurgical Paradigms for Tumor Resection, Portland International Neuroscience Symposium, Portland, Oregon, July 2013.

Simulation for Neurosurgery Boot Camps, OHSU Simulation Grand Rounds, February 4<sup>th</sup>, 2013.

Extracranial findings of congenital lesions, Pediatric Grand Rounds, Peace Health Southwest Washington Medical Center, Vancouver Washington, January 24, 2012.

Surgical treatment of epilepsy, Clinical Neuroscience at the Oregon Coast, Oregon Health & Science University CME Course, Salishan, Oregon, September 2011.

Stem Cell Therapy of Lysosomal Storage Disorders. North Pacific Pediatric Colloquium, April 2011, Portland, Oregon.

Large heads, small heads, misshapen heads. Pediatrics Grand Rounds, Peace Health Medical Center, Eugene, Oregon, September, 2010.

CSF Shunt Emergencies. Foundations in Neurosurgery "Bootcamp" for Neurosurgery R1s and R2s (University of Washington, Stanford, University of California San Francisco, University of Southern California, OHSU), Oregon Health & Science University, Portland, OR, August, 2009.

Lumps, Bumps, Dimples and Tracts: Stigmata of Dysraphism. The Children's Clinic, Grand Rounds, Tualatin, Oregon, June, 2009.

Cutaneous markers of dysraphism. Internal Medicine and Pediatrics Grand Rounds, Willamette Falls Hospital, Oregon, March, 2009.

Lumps, Bumps and Dimples: Physical Examination Findings of Dysraphism, Broadway Pediatric Associates, Portland, Oregon, March, 2009.

Controversies and Evidence in the Management of Tethered Cord Syndrome, Grand Rounds, Salem Childhood Health Associates, October, 2008.

Neural stem cells and human CNS therapeutics. July, 2008, *BrainNet* Seminar, Portland, Oregon.

Physical diagnosis of spinal and cranial congenital anomalies. December, 2007, Northwest Permanente Pediatric Grand Rounds, Portland, Oregon.

Cutaneous markers of spinal dysraphism. November 2007, Pediatric Review and Update, Portland, Oregon (CME, Oregon Pediatric Association).

The Spectrum of Tethered Cord, Shriner's Hospital for Children, Portland, Oregon, March 14, 2007.

Minimal Tethered Cord Syndrome: 2<sup>nd</sup> Annual Pediatric Review and Update, OHSU CME, Portland, Oregon, December, 2006.

Tethered Cord Surgery: Signs, Symptoms, Indications and Pitfalls, Neonatology and Pediatrics Grand Rounds, Rogue Valley Medical Center, Medford, Oregon, Nov. 2<sup>nd</sup>, 2006.

Panel Presentation on Cranial Synostosis Management, Interdisciplinary Problem Solving in Cranio-Maxillofacial Surgery, November 5<sup>th</sup>, 2005, Portland, Oregon; ACMF (Advanced Cranio-Maxillofacial Forum).

Advances in the Surgical Treatment of Childhood Epilepsy. 168<sup>th</sup> Annual Meeting of the North Pacific Pediatric Society, Portland, Oregon, March 2005.

The Cutting Edge: Technology in Pediatric Surgical Neuro-oncology. 10<sup>th</sup> Annual Meeting, Frontiers in Translational Research in Neuro-oncology and the Blood-Brain Barrier, Bend, Oregon, March 2004.

Tethered Spinal Cord: Diagnosis, Management, and Controversies. Neonatology/Pediatrics Grand Rounds, Rogue Valley Medical Center, Medford, Oregon, November, 2002.

Guidelines for the Management of Severe Traumatic Brain Injury in Children. Medical and Surgical Grand Rounds, St. Charles Regional Medical Center, Bend, Oregon, August, 2002.

Two Year Old With Pineal Mass, and Panel Discussion. 8<sup>th</sup> Annual International Meeting of the Blood Brain Barrier Disruption Consortium, Stevenson, Washington, April, 2002.

Recent Advances in Pediatric Neurosurgery. 164<sup>th</sup> Meeting of the North Pacific Pediatric Society, Portland, Oregon, March, 2001.

Tethered Spinal Cord and Spina Bifida Occulta. Kaiser/Northwest Permanente Pediatric Grand Rounds, Portland, Oregon, September, 2001.

Hydrocephalus Emergencies. Oregon Emergency Medical Services for Children Annual Conference. Kaizer, Oregon, June, 2001.

Technology in Surgery. Harvard Alumni Association of Oregon Annual Meeting, Portland, Oregon, May, 2001.

Pediatric Spinal Cord Injury. Twelfth Annual Northwest States Trauma Conference, Bend, Oregon, May, 2001.

New therapies for hydrocephalus. Pediatric Grand Rounds, Sacred Heart Medical Center, Eugene, Oregon, January, 2001.

Skull deformities in children. Pediatric Grand Rounds, Salem Hospital, Salem, Oregon, December, 2000.

Advances in the treatment of hydrocephalus. Rogue Valley Medical Center Neonatology Grand Rounds, Medford, Oregon, November, 2000.

Cranial synostosis and positional head deformity. Rogue Valley Medical Center Pediatric Section, Medford, Oregon, November, 2000.

## **V. SERVICE**

### **Membership in Professional Societies:**

Fellow, American College of Surgeons (FACS)

Fellow, American Academy of Pediatrics (FAAP)

Society of Neurological Surgeons

American Society of Pediatric Neurosurgeons

American Academy of Neurological Surgery

Society of University Neurosurgeons

Fellow, Cambridge Philosophical Society

North American Society for Neuroscience

American Association of Neurological Surgeons

Congress of Neurological Surgeons

Western Neurosurgical Society  
International Society of Pediatric Neurosurgeons  
AANS/CNS Section on Pediatric Neurological Surgery  
Women in Neurological Surgery  
Oregon Medical Association  
Oregon Neurosurgical Society

**Granting Agency Review Work:**

Ad hoc grant reviewer, State of Pennsylvania Medical Initiatives Grant Program, 2010 (for hydrocephalus related medical device grants).

Ad hoc grant reviewer, State of Kentucky Spinal Cord and Head Injury Research Board, 2004.

**Editorial and Ad Hoc Review Activities:**

Editor, Program Directors' Toolkit (dynamic web-based tools for North American neurosurgery residency Program Directors, created and hosted by the Society of Neurological Surgeons, the 'Senior Society'), [www.societyofns.org](http://www.societyofns.org). Mary, 2007 to May 2014.

Member, Editorial board, JNS Online 3D Surgical Atlas, July, 2011 to present.

Member, International advisory board, Turkish Neurosurgery, April 2014 to present.

Chair, Clinical Event Committee, Hyperbranch Medical Technologies Phase II Study, NuSeal dural sealant, 2010-11.

Member, Clinical Event Committee, Hyperbranch Medical Technologies Phase I Study, NuSeal dural sealant, 2009-10.

Editor, *SANS Lifelong Learning*, Jan. 2005-Sept 2007. (Associate Editor, *SANSwired*, 2003-04). *SANS* is now a requirement of the American Board of Neurological Surgery for Maintenance of Certification (MOC). At [www.sanswired.com](http://www.sanswired.com).

Editor (invited), *Journal of Neurosurgery: Focus*, Neurogenomics and Neuroproteomics, January, 2010, issue.

Editor (invited), *Journal of Neurosurgery: Focus*, Stem Cell Transplantation and Human Therapeutics, March-April, 2008, issue.

Editorial Board, *Pediatric Neurosurgery*, Karger, Basel, Switzerland, January 2004 to present.

Editorial Board, *Congress Quarterly*, Lippincott, Williams & Wilkins, Las Vegas, NV, September, 2006 to December, 2008.

Editorial Panel, *Clinical Neurosurgery*, Lippincott, Williams & Wilkins, Las Vegas, NV, September, 2007 to 2009.

Scientific Program Committee, Western Neurosurgical Society, 2009 Annual Meeting, 2010 Annual Meeting.

Abstracts review committee, CNS Annual Meeting (2006, 2007), Joint Section for Pediatric Neurosurgery Section Meeting (2004), and Joint Section for Pediatric Neurosurgery CNS Annual Meeting Session (2004, 2005).

Contributing Editor (Pediatric neuro-oncology), *Select Review in Neuro-Oncology*, American Association of Neurological Surgeons/Congress of Neurological Surgeons Joint Tumor Section and the Society for Neuro-Oncology, 1999 to 2003. At [www.neurosurgery.org](http://www.neurosurgery.org).

Member, International Brain Injury Association Advisory Group on Guidelines for the Management of Severe Head Injury in Children, 2000 to 2003, and 2009 to present (revision and re-release).

*Turkish Neurosurgery* (official journal of the Turkish Neurosurgical Society), Advisory Board, March 2014 to present.

*Journal of Neurosurgery*, Ad hoc manuscript reviewer.

*Neurosurgery*, Ad hoc manuscript reviewer.

*Simulation*, Ad hoc manuscript reviewer.

*Journal of Neuro-Oncology*, Ad hoc manuscript reviewer.

*Surgical Neurology*, Ad hoc manuscript reviewer.

*Child's Nervous System*, Ad hoc manuscript reviewer.

*World Journal of Surgery*. Ad hoc manuscript reviewer.

*Neuroscience*, Ad hoc manuscript reviewer.

*Psychopharmacology*, Ad hoc manuscript reviewer.

*Brain Research*, Ad hoc manuscript reviewer.

*Behavioural Brain Research*, Ad hoc manuscript reviewer.

*Pharmacology Biochemistry and Behavior*, Ad hoc manuscript reviewer.

*Contemporary Clinical Trials*, Ad hoc manuscript reviewer.

*Journal of Zhejiang University: Science*, Ad hoc manuscript reviewer.

*Neuroscience Letters*, Ad hoc manuscript reviewer.

*Postgraduate Medical Journal*, Ad hoc manuscript reviewer.

## **Committees:**

### International/National

President, Congress of Neurological Surgeons, October 2014 to September 2015.

President-elect, Congress of Neurological Surgeons, October 2013 to October 2014.

Member, Board of Directors, Neurosurgery PAC, October 2013 to April 2016.

Vice President, Board of Directors, CNS Foundation, January 2014 to present.

Member, SNS-AANS-CNS Neurosurgical Portal Executive Committee, 2014-17.

Member, Ex Officio, AANS-CNS Washington Committee, December 2013 to July 2015.

Chair, Milestones Group (Neurosurgery), ACGME, August 2012 to present.

Chair, Committee on Resident Education (CoRE), Society of Neurological Surgeons, May, 2012 to present.

Member, ACGME Advisory Group for Neurosurgery, Milestones Initiative, August 2011 to present. (Chair, Communications Competency subgroup).

Member, Board of Directors, NeuroPoint Alliance, parent organization of the National Neurosurgery Quality and Outcomes Database, October 2011 to present.

Member, SNS Infrastructure Task Force, December 2013 to present.

National Course Director, Foundations in Neurosurgery PGY1 Bootcamp Courses (6 regional courses for all US Neurosurgery PGY1 incoming residents), Society of Neurological Surgeons, July 2010, July 2011, July 2012.

Co-Chair, Hydrocephalus Association National Conference, July 2014, Portland, Oregon.

Secretary, Congress of Neurological Surgeons, October, 2009 to October 2012.

Executive Committee, Congress of Neurological Surgeons, Member (Ex Officio), October 2005 to October, 2009.

Strategic Planning Committee, Congress of Neurological Surgeons, Member, January, 2007 to present.

Co-Chair, Special Committee to Review CNS Public Policy and Socio-economic Advocacy (PARC), January, 2010 to January, 2011 (Report Janary 17, 2011).

Co-Chair, PARC Implementation Committee (III) for Policy, Budgetary Oversight and Washington Committee Leadership Training, May 2011 to present.

Member, CEO Search Committee, Congress of Neurological Surgeons, October 2011 to May 2012.

Co-Chair, Scientific Committee, National Neurosurgery Quality and Outcomes Database (N<sup>2</sup>QOD), January 2011 to present.

Symposium Co-Director, (PC17) RRC Next Accreditation System, Milestones, and the Neurosurgery Matrix, Congress of Neurological Surgeons Annual Meeting, October 2014, Boston, MA.

Symposium Co-Director, (PC13) ACGME Milestones and Next Accreditation System, Congress of Neurological Surgeons Annual Meeting, October 2013, San Francisco, CA.

Symposium Director, Mock Clinical Competency Committee, Society of Neurological Surgeons Annual Meeting (Program Director and Coordinator Course), June 1013, Boston, Massachussetts.

Breakfast Seminar Director, CNS Stem Cell Transplantation, AANS Annual Meeting, New Orleans, 2013, 2014, 2015.

Course Director, ACGME Practical Course (PC14) for Residency Directors, Coordinators, Department Chairs, and Educational Leaders on Milestone Implementation, October 2012, Chicago, IL.

Member, SNS Matrix Subcommittee, CoRE (Committee on Resident Education), Chair Communications Competency Group, 2012.

Chairman, Annual Meeting Committee (2009 Annual Meeting), Congress of Neurological Surgeons.

Chairman, Education Committee, Congress of Neurological Surgeons, January 2009 to October 2009 (member 2006 to present).

Member, Committee for Long Range Planning and Development of *Neurosurgery*, October 2008 to July 2009 (including selection of new Editor in 2009).

Chairman, SANS Committee, Congress of Neurological Surgeons, May, 2006 to September, 2008. (Vice-chairman, February to May, 2006).

Chairman, Scientific Program Committee (2008 Annual Meeting), Congress of Neurological Surgeons.

Vice-Chairman, Scientific Program Committee (2007 Annual Meeting), Congress of Neurological Surgeons.

Chair, Scientific Program Committee, Society of Neurological Surgeons, the 'Senior Society', 2012 Annual Meeting (Member, 2010 and 2011).

Member, Committee on Resident Education (formerly Curriculum Committee), Society of Neurological Surgeons, the 'Senior Society', May 2007 to May 2012.

Chair, Neurosurgery Intern 'Bootcamp' Subcommittee (CoRE), the 'Senior Society', January 2010 to present.

Course Director, PC14, RRC Next Accreditation System, Milestones and the Neurosurgery Matrix. Congress of Neurological Surgeons Annual Meeting, October 2012.

Moderator, Session V, 'Achieving Understanding', Society of Neurological Surgeons Annual Meeting, 2012, Atlanta, Georgia.

Guest Examiner (Oral), American Board of Neurological Surgery, May 2009.

Member, Commission for Neurosurgical Residency Redesign, Representative of the Senior Society, member Information Technology and Finance Subcommittee, July 2007 to May 2009.

Co-Chairman, Educational Strategic Planning Committee, Congress of Neurological Surgeons, April 2008 to October 2009.

Co-Chairman, Integrated Medical Learning Subcommittee, Scientific Program Committee (2007 Annual Meeting), Congress of Neurological Surgeons.

Member, Initiatives Coordination Committee, Congress of Neurological Surgeons, September, 2007 to October 2009.

Member, Ad Hoc Committee on Conflict of Interest, Congress of Neurological Surgeons, January 2008 to October 2009.

Member, Scientific Program Committee, Oversight Subcommittee, General Scientific Sessions Subcommittee, Abstracts Subcommittee (2006 Annual Meeting), Congress of Neurological Surgeons.

Member, Information Technology Committee, Congress of Neurological Surgeons, 2006 to October 2009.

External referee, faculty academic promotion: Neurosurgery, University of Virginia, 2007; Neurosurgery, University of Michigan, Ann Arbor, 2007; Neurosurgery, University of Virginia, 2008; Neurosurgery, Northwestern University, Chicago, 2008; Neurosurgery, Johns Hopkins University, 2009; Neurosurgery, Jefferson Medical College, 2010; Neurosurgery, University of Virginia, 2010; Neurosurgery, University of Michigan, 2010; Neurosurgery, University of California, San Diego, 2010; Neurosurgery, University of Illinois, Peoria, 2011; Neurosurgery, University of Michigan, Ann Arbor, 2012; Neurosurgery, Vanderbilt University, 2012; Neurosurgery, University of Wisconsin, 2012; Neurosurgery, UCSF, 2012; Neuroradiology, Wake Forest, 2013; Neurosurgery, Cleveland Clinic, 2013; Neurological Surgery, UCSD, 2014; Neurological Surgery, Case Western Reserve University, 2014.

Moderator, American Society of Pediatric Neurological Surgeons, General Scientific Session III, Functional Pediatric Neurosurgery, Jan. 28<sup>th</sup>, 2008, Kona, Hawaii.

Moderator, Congress of Neurological Surgeons Annual Meeting, General Scientific Session IV (Transcendent Leadership: On Surgery and Society – The Challenges of Contemporary Healthcare), Thursday, Oct. 12<sup>th</sup>, 2006, Chicago, Ill.

Moderator, Congress of Neurological Surgeons Annual Meeting, Neurosurgical Forum (Pediatric Section), Monday, October 9<sup>th</sup>, 2006.

Guest, American Board of Neurological Surgery, Written Examination Committee, February, 2006, 2007, 2008, 2013, 2014.

Guest, American Board of Neurological Surgery, Written Examination Committee, September, 2012, 2013.

Guest Examiner, American Board of Neurological Surgery Oral Examination, May 2009, 2014.

Congress of Neurological Surgery Annual Meeting, Pediatric Section Platform Session Moderator, Wed. Oct. 12<sup>th</sup>, 2005, Boston, MA.

Chairman, Rules and Regulations Committee, AANS/CNS Joint Section for Pediatric Neurological Surgery, September, 2007 to March 2010 (Member, July 2003 to August, 2007).

## Regional



Western Region Course Co-Director, Foundations in Neurosurgery PGY1 Bootcamp Courses, Society of Neurological Surgeons, July 2010 to July 2012.

Course Director, Foundations in Neurosurgery "Junior Resident Bootcamp", (University of Washington, Stanford, University of California San Francisco, University of Southern California, OHSU), August, 2009, OHSU.

Member, Program Committee, Western Neurosurgical Society Annual Meeting, Bend, OR, September 2009, and Santa Fe, New Mexico, September 2010.

Member, Organizing Committee, 2008 Julian T. Hoff Symposium, University of Michigan Medical Center, Ann Arbor, MI, July 2008.

Oregon Neurosurgical Section Liaison, American Academy of Pediatrics, September, 2004 to present.

### Institutional

Chair, Search Committee for Division Chief, Pediatric Neurology, Doernbecher Children's Hospital and OHSU, June 2014 to present.

OHSU GMCEC 'Gang of Seven' - Strategic Planning and Program Mentoring for ACGME NAS and CLER Adoption, July 2012 to July 2014.

OHSU Traumatic Brain Injury Consortium, 2014 Co-Chair with Drs. James Chesnutt and George Keepers.

Interviewer, Search Committee for Associate Hospital Administrator, Director Neuroscience Service Line, December 2011.

Dean's Task force on OHSU/OHSU Medical Group integration, Member, Legal Subcommittee, 2007-2008.

Strategic Planning Subcommittee, "Learners at all Levels", SOM, OHSU, March to June 2007.

Member, OHSUMG EPIC and CHH Optimization Committee, Nov. 2006 to February 2007.

Internal referee, faculty academic promotion, OHSU School of Medicine: Pediatrics, 2003; Neurological Surgery, 2003; Psychiatry, Graduate Education, 2006; Diagnostic Radiology, 2006; Diagnostic and Interventional Radiology, 2006, Diagnostic Radiology, 2007, Plastic Surgery 2009; Pediatric Neurology, 2009; Pathology, 2010; Anesthesiology & Peri-operative Medicine, 2010; Neurological Surgery, 2011; Pediatric Nephrology, 2012; Neurology, 2012; Emergency Medicine, 2013; Anesthesiology & Peri-operative Medicine, 2013; Pediatric Oncology, 2014; Neurological Surgery, 2014 (2); Neurological Surgery/Medicine, 2014; Pediatric Anesthesia, 2014; Diagnostic Radiology, 2014; Pediatric Intensive Care, 2014.

Interviewer, Emergency Medicine Chairperson Search, OHSU, 2006.

Oregon Health & Science University Medical Group (OHSUMG), Elected Member, Board of Directors, July 2004 to July 2007.

OHSU Cancer Center, Organ System Case Reviewer (CNS), 2004 to 2006.

Medical Educators Group, Oregon Health & Science University, August 2002 to July 2004.

### Departmental

Member, Promotions & Tenure Committee, Department of Neurological Surgery, 2011 to present.

Chairman, Campagna Scholarship Committee, Department of Neurological Surgery, OHSU, March 2007 to present.

Chairman, Clinical Competency Committee (formerly Residency Advisory Committee), Department of Neurological Surgery, OHSU, July 2006 to present.

Promotions and Tenure Committee, Department of Behavioral Neuroscience, July 2004 to 2013.

### **Community Service:**

Extensive outreach activities for the Doernbecher Foundation, approximately 30 to 40 hours per year.

Attending neurosurgeon, Shriners Children's Hospital, Portland, Oregon, 2000 to present.

Catlin Gabel School, Portland, Oregon: Head Injury Prevention in School Aged Children 2006 (2 hours); 6<sup>th</sup> Grade Surgery Day Surgical Navigation Interactive Station (4 hours) 2011, 2012, 2013, 2014; 5<sup>th</sup> Grade Brain Surgery Career Session 2011 (1 hour); 2<sup>nd</sup> Grade Brain Module guest speaker 2012 (1 hour), High School Drugs and the Brain Panel 2014 (2 hours).

### **Clinical Responsibilities (since last promotion):**

Director, Pediatric Neurosurgery, OHSU.

Attending Neurosurgeon, Doernbecher Children's Hospital.

Attending Neurosurgeon, CDRC Craniofacial Disorders Clinic.

Attending Neurosurgeon, Shriners Children's Hospital Spasticity Clinic.

Consultant Neurosurgeon, Doernbecher Interdisciplinary Epilepsy Monitoring and Surgery Conference and Program.

Consultant Neurosurgeon, Doernbecher Comprehensive Pediatric Brain Tumor Board and Clinic (co-founded in 2000).

Courtesy Staff Neurosurgeon, Department of Neurological Surgery, St. Vincent's Medical Center, Portland, Oregon.

## **VI. TEACHING (OHSU Educator's Portfolio):**

### **Overview of your Role as an Educator:**

My work as an educator falls into two general areas: departmental and institutional educational service, and national educational scholarship. This work has focused on curricular development and specific learning and assessment tools (both online and live) directed at quality, measurable outcomes, and improved patient safety. Digital tools and other formal assessments have been extensively used and the resultant data reported in the literature. Currently, I am involved in efforts to integrate these residency and post-residency curricular tools into a continuum of lifelong learning, with the ultimate goal of coordinating evolving residency milestone based curriculae with life long learning tools including patient outcome registries.

#### Departmental:

- Program Director, Neurological Surgery Residency (2005 to present)
  - Chair, Neurosurgery Residency Advisory Committee
- Development of ACMGE Competency based curriculum for RRC program reviews (2006 and 2011)
  - Quality improvement project program
  - Externally funded cranial dissections program
  - Procedural certifications program for junior residents
  - Communication certifications program for junior residents
  - Competency based evaluation tools
- New conference curriculum (including non-clinical competencies)
- Development and donor stewardship for Campagna Neurosurgery Scholarship
  - Chair of Campagna Scholars Selection Committee

#### Institutional:

- Member, Dean's Strategic Planning Group on Education (2007)
- Member, Educator's Working Group (2002-2004)
- Extensive direct teaching
  - 2 lectures and 2 small group teaching hours annually
  - Clinical preceptorships
  - Multiple students supervised on Neurosurgery and Pediatric Neurosurgery rotations
  - Approximately 6 hours per year of formal didactic teaching in various departments
  - Approximately 10 hours per year of didactic and dissection based anatomical teaching for neurosurgery

- Substantial career mentorship for neurosurgery residents, undergraduate, medical and post-doctoral students

National:

- Chair, ACGME Milestones Group for Neurosurgery, August 2012 to present.
- Member, ACGME Milestones Working Group for Neurosurgery, August 2011 to June 2012.
- Member, Board of Directors, NeuroPoint Alliance, October 2011 to present (parent company of National Neurosurgery Quality and Outcomes Database)
- Co-Chair, Scientific Committee, National Neurosurgery Quality and Outcomes Database
- Editor, Program Director's Toolkit, Senior Society
- Chair, Subcommittee on Boot Camp Courses, Committee on Resident Education (CoRE), Society of Neurological Surgeons
- Society of Neurological Surgeons (Chairs and Program Directors) representative to Neurosurgery Redesigning Residency Commission
- Collaborative developer and Editor of *SANSwired*, *SANS: Lifelong Learning*, and *SANS: Competencies* (Self-assessment program required by American Board of Neurological Surgery for MOC)
- Collaborative development of *Integrated Medical Learning* and *Consensus Session* novel educational programs, Congress of Neurological Surgery
- 4 years of Congress of Neurological Surgeons Annual Meeting leadership, culminating in Scientific Program Chair (2008) and Annual Meeting Chair (2009)
- 2 years of Society of Neurological Surgeons (Chairs and Program Directors) Annual Meeting leadership, culminating in Scientific Program Chair in 2012.
- Extensive national committee service and leadership for educational and curricular initiatives, including Chair, Congress of Neurological Surgeons Education Committee, January 2009 to February 2010
- Invited talks at national neurosurgical meetings and visiting professorships, specifically covering neurosurgical education topics
- Two dozen publications on surgical education, including peer-reviewed original contributions

**Awards**

Parker J. Palmer Courage to Teach Award, ACGME, 2013.  
OHSU Graduating Class, Outstanding Mentor Designation, 2014.

**Scholarship of Teaching:**

Curriculum Development

Development with Neurosurgery Milestones Group of milestones compatible comprehensive evaluation tools (16 documents including 12 formative and summative evaluations, online evaluation building tool, milestones-evaluations cross referencing

tool, additional portfolio sources listing, and explanatory presentation). This represents an entirely novel methodology in coordination with the new ACGME Milestones project, plus a very large set of comprehensive and extremely detailed tools.

ACGME Neurosurgery Milestones Working Group, 2011 to 2012 and Chair, ACGME Neurosurgery Milestones Group, 2012 to present. Development of the inaugural neurosurgery milestones sets (24 sets related to the 6 ACGME competencies for neurosurgical training through residency and fellowship level).

Society of Neurological Surgeons, practical course on ACGME Accreditation and Milestones, Co-Chair and faculty member, October 2013 (in conjunction with the Congress of Neurological Surgeons Annual Meeting, San Francisco – PC13).

Society of Neurological Surgeons, symposium on the ACGME Next Accreditation System and Neurosurgical Milestones, June 2013.

Society of Neurological Surgeons, practical course on ACGME Milestones Implementation, Chair and faculty member, October 2012 (in conjunction with the Congress of Neurological Surgeons Annual Meeting, Chicago – PC14).

Society of Neurological Surgeons, curriculum needs assessment and development for national Junior Residents Course, 2012 (Course development and implementation by Dr. Rich Byrne and the Subcommittee on Resident Courses, 2013).

Society of Neurological Surgeons, symposium on the use of simulation in neurosurgical residency education, including break out sessions using manikin based cognitive and decision making skills trainers. Planning, faculty selection and organization for didactic and hands on three hour symposium for 60 neurosurgical RRC Program Directors and department chairs, May, 2011.

Society of Neurological Surgeons PGY1 Boot Camp Courses national curriculum, 2010-present. Six regional courses (Portland, Chicago, Houston, Atlanta, Philadelphia, Boston) serving all (approximately 200) U.S. neurological surgery interns nationally. Responsible for coordination with national program directors society and sponsors, leadership of responsible SNS committee, curriculum creation, course materials creation, design and implementation of national course surveys, selection of course cities, centers and directors. This national effort was the subject of a news report on CNN, *Calling Dr. Gupta*, August 2010.

Pacific Region PGY1 Boot Camp curriculum, (University of Washington, Stanford, University of California San Francisco, University of Southern California, OHSU), August, 2009, OHSU. Pilot PGY1 Boot Camp course. Responsible for curriculum design, funding, organization, faculty selection and administration.

Self-Assessment in Neurological Surgery (SANS), Non-clinical core competencies curriculum, at <http://sans.cns.org>.

OHSU Neurosurgery Residency Program conference curriculum.

### Educational Publications

See Publications (Peer-reviewed, Non peer-reviewed, and Electronic)

### Educational Conference Presentations

#### National:

See invited presentations.

#### Local:

Chiari I Malformation: Pathophysiology, Surgical Techniques, and Case Presentations, Neurological Surgery Grand Rounds, OHSU, July, 2014.

Update on Milestones, Evaluations and NAS – What it means for residents, Neurological Surgery Grand Rounds, OHSU, June, 2014.

Clinical Presentation and Management of Dysraphism, Spine Conference, Departments of Neurological Surgery and Orthopedics, Oregon Health & Science University, May 2014.

Quick Brain MRI for VP Shunt Failure: Quality Improvement, Utilization and Test Characteristics, Neurosurgery Grand Rounds, January 2014.

Matching in Neurological Surgery, Neurosurgery Interest Group, OHSU SOM, January 2014.

Choosing Neurosurgery (Lecture, MSII). OHSU School of Medicine Continuity Specialty Course: Neurosurgery, September, 2013.

Milestones Compatible Resident Evaluations: How To. Neurosurgery Grand Rounds, August, 2013.

The Future of Neurosurgical Technology, OHSU Foundation Board Luncheon, June 2013.

ACGME Milestones: What they mean for our program. OHSU Neurosurgery Teaching Conference, May 2013.

Safe Patient Care Hand Offs. OHSU Neurosurgery Grand Rounds, February 2013.

Hydrocephalus and ventriculoperitoneal shunts. OHSU School of Medicine MS II Neurosciences course, February, 2013.

Academic career development in neurological surgery. OHSU Neurosurgery Grand Rounds, January, 2013.

The Future of Doernbecher Neurosurgery, Doernbecher Foundation Board Luncheon Meeting, December, 2012.

Milestones: A practical approach. Portland VA Medical Center GME Group Meeting, December, 2012.

ACGME Milestones, what it means for PD's, PC's and Programs. OHSU GME Afternoon Seminar, OHSU, August, 2012.

Hydrocephalus and ventriculoperitoneal shunts. OHSU School of Medicine MS II Neurosciences course, February, 2012.

Cutaneous markers of dysraphism, Pediatric resident luncheon seminar, September 2011.

Cranial vault shape, synostosis and positional head deformity. Department of Neurological Surgery Grand Rounds, OHSU, August 8, 2011.

Ethics in human subjects research. Department of Neurological Surgery Grand Rounds, OHSU, March 28, 2011.

Head shape and size, diagnosis and treatment of synostosis. Department of Neurological Surgery Grand Rounds, OHSU, November 29, 2010.

Professionalism in Neurological Surgery. Department of Neurological Surgery Grand Rounds, OHSU, June 2010.

Craniopharyngiomas in Children: To Resect or Not To Resect? Department of Pediatrics Grand Rounds, OHSU, January 2010.

Modified orbitozygomatic craniotomy for craniopharyngioma resection in children, Neurosurgery Grand Rounds, Oregon Health & Science University, November, 2009.

CSF Shunt Emergencies, Neurosurgery Grand Rounds, Oregon Health & Science University, July, 2009.

Clinical Research Using CNS Cellular Therapeutics: Barriers and Strategies, Neurosurgery Grand Rounds, Oregon Health & Science University, November, 2008.

Human Subjects Research: Obligation to the Patient, Neurosurgery Grand Rounds, Oregon Health & Science University, August, 2008.

Evaluation of CSF Shunt Malfunction, Neurosurgery Grand Rounds, Oregon Health & Science University, July, 2008.

Chiari I Malformation: Indications and Methods, Neurosurgery Grand Rounds, Oregon Health & Science University, May, 2008.

Lumps, Bumps, Pits and Tracts in Dysraphism, Pediatrics Grand Rounds, Oregon Health & Science University, October, 2007.

Cutaneous Signs of Cranial and Spinal Dysraphism, Neurosurgery Grand Rounds, Oregon Health & Science University, October, 2007.

Pediatric Neurosurgical Emergencies, Neurosurgery Grand Rounds, August, 2007.

The Amygdala and Pain Modulation. Behavioural Neuroscience Monday Morning Seminars, October 30<sup>th</sup>, 2006.

Tethered cord controversies: The state of the art. OHSU Neurosurgery Grand Rounds, September, 2006.

Advances in Epilepsy Surgery for Children, Doernbecher Children's Hospital – Credit Unions for Kids Annual Luncheon (with Colin Roberts, MD), June, 2006.

Discussant: Occult Tethered Cord Syndrome, Pediatrics Department Journal Club, OHSU, June, 2006.

Lifelong Learning in Neurological Surgery. OHSU Department of Neurology Grand Rounds, June, 2006.

What Are the Core Competencies and How Do We Learn Them? OHSU Neurosurgery Teaching Conference, February, 2006.

'Forgive and Remember': Ethical Behavior in Neurological Surgery Training. OHSU Neurosurgery Teaching Conference, January, 2006.

Evidence and Minimal Tethered Spinal Cord: Where we are headed. OHSU Department of Neurology Grand Rounds, November, 2005.

Pain Modulatory Neurons in the Medulla. Department of Behavioral Neuroscience Research Seminar, October, 2005.

Tethered Spinal Cord: Current Practices and Controversy. OHSU Neurosurgery Teaching Conference, September, 2005.

Hydrocephalus: Principles and Emergency Treatment. OHSU Neurosurgery Teaching Conference, July, 2005.

Descending Pain Modulation and the Medulla. Oregon Child Health Research Center Site Review Conference, February, 2005, OHSU.

Doernbecher Childhood Epilepsy Program. Department of Pediatrics Grand Rounds, February, 2005.

Advances in the Surgical Care of Epilepsy in Children, Board of Directors Meeting, Doernbecher Children's Hospital Foundation, Oregon Health & Science University, December, 2004.

Recurrent High Grade Ependymoma, Department of Pediatrics Tumor Board, Oregon Health & Science University, August, 2004.

Quality Review and Protocol Care for Children With Ventricular Shunts, Neurosurgery Department Teaching Conference, Oregon Health & Science University, July, 2004.

Indications for Surgical Management of Chiari I Malformation: New Data from Doernbecher Children's Hospital on Minimally Invasive Techniques, Neurology/Neurosurgery Grand Rounds, Oregon Health & Science University, December, 2003.

Guidelines for the Management of Severe Traumatic Brain Injury in Children. Neurology/Neurosurgery Grand Rounds, Oregon Health & Science University, Portland, Oregon, September, 2003.

Guidelines for the Management of Severe Traumatic Brain Injury in Children. Pediatrics Grand Rounds, Doernbecher Children's Hospital, Portland, Oregon, September, 2003.



Evidence Based Medicine: Guideline Formulation – Pediatric Head Injury. Neurosurgery Grand Rounds, Oregon Health & Science University, Portland, Oregon, August, 2003.

Spinal Cord Tethering, An Evidence Based Approach. Pediatric Grand Rounds, Doernbecher Children's Hospital, Portland, Oregon, May 2003.

Development of Nociceptive Systems in the CNS and PNS. Pain Elective Course, 2<sup>nd</sup> Year SOM, March 2003.

Core Competencies Training in Neurological Surgery, Neurological Surgery Teaching Conference, Oregon Health & Science University, Portland, Oregon, March, 2003.

Emergency Care of Hydrocephalus Patients. Neurological Surgery Teaching Conference, Oregon Health & Science University, Portland, Oregon, February, 2003.

A Vision for Pediatric Neurosurgery at OHSU. Pediatric Neurosurgery Team Building Retreat, Portland, Oregon, February, 2003.

Cerebral Mass Lesions. Neuroscience and Behavior, 2<sup>nd</sup> Year Core Course, Oregon Health & Science University, School of Medicine, Portland, Oregon, February, 2001, 02, 03.

Intrathecal baclofen therapy for spasticity. Operating Room Training Series, Doernbecher Children's Hospital, January, 2003.

Neurological Surgery for Pain. Neuroscience and Behavior, 2<sup>nd</sup> Year Core Course, Oregon Health & Science University, School of Medicine, Portland, Oregon, January, 2003.

Pediatric Neurosurgical Emergencies. Emergency Medicine Teaching Lecture Series, Oregon Health & Science University, School of Medicine, Portland, Oregon, January, 2003.

Anatomical investigation of pain modulatory circuitry in the rostral ventromedial medulla. Raaf Professorship Celebration, Oregon Health & Science University, Neurosurgery Departmental Presentations, October, 2002.

Team Building. Leadership and Residency Core Competencies Working Group Meeting. Oregon Health & Science University, October, 2002.

Spinal Cord De-tethering: Current Practice and Controversies. Neurology/Neurosurgery Grand Rounds, Oregon Health & Science University, October, 2002.

Post-hemorrhagic Hydrocephalus. Neonatology Fellows Teaching Conference, Oregon Health & Science University, March, 2002.

Careers in Neurosurgery: "It ain't just brain surgery". School of Medicine, Oregon Health and Science University, March, 2002.

Management of Spinal Tumors in Neurofibromatosis. Pediatric Oncology Seminar, Oregon Health & Science University, August, 2001.

Triage and Management of Hydrocephalus Patients. Neurology/Neurosurgery Grand Rounds. Oregon Health & Science University, Portland, Oregon, June 2001.

Interdisciplinary Care in Pediatric Neurosurgery. Society for University Neurosurgeons. Oregon Health & Science University, Portland, Oregon, June, 2001.

Advances in Pediatric Neurological Surgery. Credit Unions for Kids, Doernbecher Children's Hospital, May, 2001.

Pediatric Neurosurgery for the 21<sup>st</sup> Century. Doernbecher Children's Hospital Foundation Board Meeting, Portland, Oregon, May, 2001.

Spinal cord de-tethering: Is it worth it? CDRC/Shriner's Children's Hospital Annual Spina Bifida Conference, Portland, Oregon, April 2001.

Surgical Care of the Hydrocephalus Patient. Doernbecher Children's Hospital Operating Rooms Nursing Conference, March, 2001.

Doernbecher Children's Hospital Comprehensive Pediatric Brain Tumor Program, Doernbecher Medical Staff Meeting, March, 2001.

Acute paraplegia in a toddler. Doernbecher Children's Hospital Grand Rounds, Oregon Health & Science University, Portland, Oregon, February, 2001.

Development of Pediatric Neurosurgery at OHSU. Doernbecher Children's Hospital Foundation Board Meeting, Oregon Health & Science University, Portland, Oregon, February, 2001.

Pediatric Management of Children with Hydrocephalus. Pediatrics Teaching Conference, Oregon Health & Science University, Portland, Oregon, February, 2001.

Hydrocephalus emergencies. Emergency Medicine Grand Rounds, Oregon Health & Science University, Oregon, January, 2001.

Diagnosis and management of hydrocephalus. Primary and acute care pediatrics course, Oregon Health & Science University, Portland, Oregon, November, 2000.

Technology in pediatric neurological surgery. Doernbecher Children's Hospital Grand Rounds, Oregon Health & Science University, Portland, Oregon, November, 2000.

Evaluation and surgical management of hydrocephalus. Neurosurgery teaching seminar, Oregon Health & Science University, Portland, Oregon, September, 2000.

Evaluation and management of cervical spinal cord injury. Neurology/Neurosurgery Grand Rounds, Oregon Health & Science University, Portland, Oregon, September, 2000.

Computer-guided stereotaxy for surgical neuro-oncology in children. Pediatric Oncology Seminar, Oregon Health & Science University, Portland, Oregon, September, 2000.

ICU management of raised intra-cranial pressure. Pediatric Intensive Care Unit Nursing Education Series, Oregon Health & Science University, Portland, Oregon, August, 2000.

Coronal Synostosis. Neurosurgical Grand Rounds, Northwestern University Medical School, Chicago, Illinois, December, 1999.

The University of Michigan Emergent Imaging and Decompression Protocol. 150th Anniversary of the Department of Surgery, Scientific Symposia, University of Michigan Medical Center, Ann Arbor, Michigan, June, 1999.

Contemporary management of spinal cord injury. Trauma Surgical Grand Rounds, Department of Surgery, University of Michigan Medical Center, Ann Arbor, Michigan, May, 1999.

Brainstem reticular activating system: A current perspective. Neurosurgical Grand Rounds, University of Michigan Medical Center, Ann Arbor, Michigan, 1998.

Pathophysiology and management of spinal cord injury. Neurosurgical Grand Rounds, University of Michigan Medical Center, Ann Arbor, Michigan, 1998.

Microtubule associated proteins and cortical anatomy in the human brain. Neurosurgical Grand Rounds, University of Michigan Medical Center, Ann Arbor, Michigan, 1998.

Chiari I Malformation: Pathophysiology and surgical management. Neurosurgical Grand Rounds, University of Michigan Medical Center, Ann Arbor, Michigan, 1996.

The research team: students and their mentors. Walter B. Cannon Society Research Symposium, Harvard Medical School, 1993.

Locus ceruleus and selective attention in animal models. Seminars in Behavioral Neurology, Longwood Area Hospitals and the Harvard Medical School Department of Neurology, 1991.

Prospects for the Class of 1993 in science and medicine. In 'Medicine 1940-1990: Perspectives in patient care.' Scientific Symposia of the Harvard Medical Alumni Association, 1990.

Stress, spatial learning and ceruleo-cortical noradrenaline. Behavioral Neurobiology Seminars, Departments of Anatomy and Experimental Psychology, University of Cambridge, 1989.

Noradrenaline and attention. Behavioral Neurobiology Seminars, Departments of Anatomy and Experimental Psychology, University of Cambridge, 1988.

#### **Education Grants and Contracts:**

2011-15 Society of Neurological Surgeons National PGY1 Bootcamp Courses. Direct costs grant (not including extensive national donation of in kind resources by multiple corporate sponsors). From Stryker, to the Society of Neurological Surgeons and Congress of Neurological Surgeons, \$1,890,000.

2010 Society of Neurological Surgeons National PGY1 Bootcamp Courses. 6 direct unrestricted educational grants to regional course centers totaling \$150,000, plus \$150,000 in in-kind donations.

2010 Society of Neurological Surgeons Western Regional PGY1 Bootcamp Course, Co-Director, \$25,000 cash and \$17,000 of in kind unrestricted educational grants to OHSU Neurosurgery.

Campagna Scholarship endowment, to Doernbecher Children's Hospital Foundation, Administered by the Department of Neurological Surgery, \$215,000.

Unrestricted educational grants for Integrated Medical Learning©, Integra Foundation, to the Scientific Program Committee of the Congress of Neurological Surgeons, \$100,000 (2007) and \$100,000 (2008).

Unrestricted educational grant to OHSU Neurosurgery Residency Program for trainee attendance at the Woods Hole 'Research and Update in Neurosurgery & Neuroscience' training course, Synthes CMF Education, \$5000, 2009, 2010, 2011.

Unrestricted educational grant to OHSU Neurosurgery Residency Program for trainee attendance at the Armed Forces Institute of Pathology Course, Stryker Educational Foundation, \$5000, 2008, 2009, 2010, 2011.

Unrestricted educational grant to OHSU Neurosurgery Residency Program Cranial Dissection Curriculum (cadavers and supplies), Synthes Educational Foundation, \$4000 each in 2007 and 2008, \$6000 in 2009, 2010, 2011, 2012.

**Educational Activity (see Appendix A and B):**

Faculty, OHSU MS 1 Gross Anatomy Lab, 2 hour spinal cord and meninges module, 2009, 2010.

Faculty, Oregon Health & Science University Neurological Surgery Teaching Conference: Series of eight tutorials on human neuroanatomy, 2002, 2003, 2006, 2008, 2010.

Faculty, Neurosciences Core Course, School of Medicine, Oregon Health & Science University: 2 lectures (Surgical Management of Pain, and Mass Lesions) and 2 small group tutorials (Head Injury and Mass Lesions), annually 2001-10. Lecture on Pediatric Neurosurgery and Hydrocephalus, 2012.

Faculty preceptor, Pediatric neurosurgery rotation, Oregon Health & Science University: Monthly rotation for 5 students in 2000-05, 2 in 2006, one student 2007, two students, 2008, 2009 and 2010, one student 2011.

Faculty, Continuity Curriculum, School of Medicine, Oregon Health & Science University: 1 lecture (Neurosurgery: Emergencies in Pediatric Neurosurgery), 2009.

Clinical Preceptor SOM 2<sup>nd</sup> Year Students: Spring term 2007.

Faculty preceptor, Child Health II rotation, one month neurosurgery selective, Oregon Health & Science University, 2004 to present, two students 2006, one student 2012.

Faculty, Oregon Health & Science University, School of Medicine 2<sup>nd</sup> Year Elective Course in Pain Medicine and Neuroscience, 'Pain and Nervous System Development' Seminar, 2002 and 2004.

Faculty, Nervous System and Behavior Core Course, Harvard Medical School, 1992.

Faculty, Natural Sciences, Queens' College, University of Cambridge, 1987 to 1989.

Teaching Assistant, Human Biology Core, Stanford University, Spring, 1986.

### **Service and Membership of Educational Committees:**

See Committees (International/National, Regional, and Institutional)

### **Mentoring:**

#### Neurosurgical Trainees:

Hai Sun (2014) – Fellow in Skull Base and Vascular Neurosurgery, Barrow Institute, Phoenix, Arizona.

Neil Roundy (2014) – Staff Neurosurgeon, Peace Health, Eugene, Oregon.

Eric Thompson (2013) – Asst. Professor, Duke University (after fellowship in Pediatric Neurological Surgery, Hospital for Sick Children, University of Toronto, Toronto, Canada).

Mark Piedra (2013) – Staff Neurosurgeon, Billings, Montana.

Ahmed Raslan (2012) – Assistant Professor, Functional neurosurgery, Oregon Health & Science University.

Mehmet Berk (2012) – Staff Neurosurgeon, Legacy Health Care, Portland, Oregon.

Emun Abdu (2011) – Staff Neurosurgeon, House Institute, Los Angeles, California, (after fellowship in Vascular and endovascular neurosurgery, Swedish Hospital, Seattle, Washington).

Samual Hughes (2011) – Staff neurosurgeon, Adventist Hospital, Portland, Oregon.

Zachary Litvack (2010) – Asst Professor, George Washington University and Residency Program Director (after NREF skull base endoscopic fellowship at Harvard/Brigham & Women's Hospital).

Jason Weinstein (2010) – Chief of Neurosurgery, Northwest Permanente, Portland, Oregon.

Kiarash Golshani (2009) – Asst Professor, Loma Linda University (after endovascular fellowship at Duke University).

Justin Cetas (2009) – Associate Professor, Oregon Health & Science University (after skull base fellowship at Oregon Health & Science University).

Kenneth Liu (2008) – Asst Professor, University of Virginia, Charlottesville (after endovascular fellowship at Oregon Health & Science University).

Jonathan Carlson (2008) – Staff Neurosurgeon, Sacred Heart Medical Center, Spokane, Washington.

Matthew Hunt (2007) – Asst Professor and Residency Program Director, University of Minnesota (after skull base fellowship at Queen’s Square, London, England).

Warren Roberts (2007) – Staff Neurosurgeon, Adventist Hospital, Denver, Colorado.

Aclan Dogan (2006) – Associate Professor, Oregon Health & Science University (after skull base and endovascular fellowships at Oregon Health & Science University).

Farhad Limonadi (2005) – Staff Neurosurgeon, Eisenhower Medical Center, Palm Desert, California.

Additional/Other:

Marshall Scholarship Alumni Mentor – Stanford University, 2013 to present.

Eric Thompson, MD, resident, Pediatric neurosurgery and organized medicine, 2006 to present, multiple peer reviewed articles and national presentations on pediatric neurosurgery topics, application for CSNS socioeconomic fellowship, application to pediatric neurosurgery fellowships.

Susan Wozniak, MD (candidate), 2010 Campagna Scholar, 3 peer reviewed publications on vagal nerve stimulator therapy in children, national conference presentation.

Zachary Litvack, MD, resident, Pediatric neurosurgery and organized medicine, 2005 to 2010, chapter in Youman’s textbook on tethered cord; Congress of Neurological Surgeons Top Ten abstract (Pediatric Section), Western Neurosurgical Society Clinical Award, and journal article on extradural Chiari decompression; Chair of CNS Resident and SANS Resident Challenge Committees and full membership on CNS Executive Committee (2 years).

Jen Maire, BS, laboratory assistant, Central Mechanisms of Nociceptive Modulation, Selden laboratory, 2008 to 2009, publication of peer-reviewed manuscript, application to OHSU Medical School.

Liesl Close, BA, laboratory assistant, Central Mechanisms of Nociceptive Modulation, Selden laboratory, 2004 to 2008, publication of multiple peer-reviewed manuscripts, admission to OHSU Medical School, application to neurosurgical residency 2011-12.

Justin Ortiz, MD, postdoctoral researcher, Central Mechanisms of Nociceptive Modulation, Selden laboratory, August 2005 to present, publication of multiple peer-reviewed manuscripts, Anesthesiology National Academy Resident Award, admission to funded Research Track, OHSU Anesthesia and Peri-operative Medicine Residency Program.

Jonathan Carlson, MD, PhD, neurosurgical house officer: Laboratory rotation co-supervisor, Dr. Carlson awarded Congress of Neurological Surgeons Tasker Award for Pain Research (2004), three manuscripts published. Mentor for Dr. Carlson’s successful OHSU Tartar Foundation resident research grant (\$2000, 2004).

Justin Cetas, MD, PhD, neurosurgical house officer: Laboratory rotation supervisor, August, 2004 to present, three manuscripts published.

Lesley Siler, OHSU MD-PhD candidate (MSTP): Laboratory rotation supervisor (summer 2003), Clinical preceptor, pediatric neurosurgery (summer 2003 and winter 2005). Successful application for internal medicine residency.

Hallie Gardner, University of Virginia pre-medical undergraduate. Summer intern 2003, participation in clinical research project, clinical observation. Successful applicant to medical school.

Rebecca Allen, Stanford University undergraduate. Summer intern, 2002, participation in clinical research project, clinical observation, co-authorship of peer-reviewed, published manuscript and two abstracts, successful application to OHSU Medical School.

Nayna Patel, University of Michigan undergraduate, Rotating and research student, 1999, participation in clinical research project, co-authorship of two peer-reviewed, published manuscripts and three abstracts, admission to University of Michigan Medical School.

Student Advisor, quarter-time academic advising position, Program in Human Biology, Stanford University, Stanford, California, 1985-86.

Resident Advisor, Program in Residential Education, Stanford University, Stanford, California, 1985-86.

## VII. PERSONAL

Diploma with High Honors, Phillips Exeter Academy, 1981.

- Legislative Intern, U.S. Senator Max Baucus, Washington, D.C., January to June, 1981.

President, Phi Kappa Psi Fraternity, Stanford University, 1984.

Starboard oarsman, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> Eights, Jesus College Cambridge, England, 1986 to 1989.

Starting guard, Jesus College Basketball Team (1988 University Cup Champions), 1986 to 1989.

Interests: Alpine skiing, whitewater rafting, hiking, backpacking, basketball, squash, mystery novels.

Married: Dr. Karen B. Selden (Hedges), Plastic and Reconstructive Surgeon. Three children.

Last Revised: December 12<sup>th</sup>, 2014



Genome Announc 2014 Aug 7;2(4). Epub 2014 Aug 7. Center for Human Genetics, Marshfield Clinic Research Foundation, Marshfield, Wisconsin, USA. View Article. Genetic Disease Research Branch, National Human Genome Research Institute, National Institutes of Health, Bethesda, MD 20892, USA. View Article. Download full-text PDF. Kochanek, Patrick M. MD, FCCM; Carney, Nancy PhD; Adelson, P. David MD, FACS, FAAP; Ashwal, Stephen MD; Bell, Michael J. MD; Bratton, Susan MD, MPH, FAAP; Carson, Susan MPH; Chesnut, Randall M. MD, FCCM, FACS; Ghajar, Jamshid MD, PhD, FACS; Goldstein, Brahm MD, FAAP, FCCM; Grant, Gerald A. MD; Kissoon, Niranjana MD, FAAP, FCCM; Peterson, Kimberly BSc; Selden, Nathan R. MD, PhD, FACS, FAAP; Tong, Karen A. MD; Tasker, Robert C. MBBS, MD, FRCP; Vavilala, Monica S. MD; Wainwright, Mark S. MD, PhD; Warden, Craig R. MD, MPH, FAAP, FACEP. 12. Rudis MI, Guslits BJ, Peterson EL, et al.: Economic impact of prolonged motor weakness complicating neuromuscular blockade in the intensive care unit. Crit Care Med 1996; 24:1749-1756. Tamorah Lewis MD, PhD, FAAP. Adverse drug reactions (ADRs) are defined as unintended and harmful effects resulting from the use of medications intended for diagnostic or therapeutic purposes. ADRs are common in pediatric inpatient settings, and the rate of ADRs is 3 times higher among pediatric patients as compared to non-elderly adults. We created a QI team at The Children's Mercy Hospital in Kansas City including me, Alexandra Oschman (PharmD) and Betsy Cammack (NICU fellow) to address the important question of ADR incidence and classification in the NICU. In the planning cycle, we reviewed the number of ADRs reported in the electronic medical record from the NICU.