Anesthesiology

Cincinnati Children's

Division Details

Division Data Summary

Research and Training Details

Number of Faculty	**51**
Number of Joint Appointment Faculty	**3**
Number of Research Fellows	**1**
Number of Research Students	**7**
Number of Support Personnel	**55**
Direct Annual Grant Support	**$972,372**
Direct Annual Industry Support	**$83,917**
Peer Reviewed Publications	**64**

Clinical Activities and Training

Number of Clinical Staff	**101**
Number of Clinical Fellows	**10**
Number of Clinical Students	**166**
Number of Other Students	**18**
Inpatient Encounters	**20,903**
Outpatient Encounters	**33,736**

Division Photo

Row 1: M Soberano, E Adler, H Flint, N Hagerman, P Ngamprasertwong, K Applegate, B Hugus, V Chidambaran
Row 2: I Lee, J Estes, J Beiersdorfer, A Orlet, M Lierman, M Linker, A Loepke, K Everhart, D Kurth, A Gruber, M Jankowski, J McAuliffe
Row 3: J Previte, E Wittkugel, A Costandi, D Moore, J Kloenne, S Sadhasivam, N Weidner, J Rose, D Gordon, L Viola, C Hoffmann, P Samuels, S Clay, M Mahmoud, A Tucker, J Kondik, K Goldschneider, J Audas, A Varughese

Significant Accomplishments

Record Year for Academic Productivity and Awards

Our faculty delivered 78 lectures nationally and internationally, and authored 55 review articles and book chapters – a 300 percent increase. Faculty members also presented 27 research abstracts at national and international meetings, authored 25 research papers in peer reviewed journals, and were awarded 15 extramural research grants. The Family Advisory council recognized Melissa Neeplo, RN, Anna Varughese, MD, Alex Szabova, MD, Paul Samuels, MD, Joseph Previte, MD, Andreas Loepke, MD, PhD, and Lynn Kling, RN, for exemplary patient-centered care. Mike Jankowski, PhD, received the Rita Allen American Pain Society Scholarship for research in pediatric pain. The Society for Pediatric Anesthesia awarded Chris Ward, MD, first prize for his research study on anesthetic neurotoxicity. The journal *Pediatric Anesthesia* bestowed upon Anna Varughese, MD, Nancy Hagerman, MD, and Dean Kurth, MD, the best paper of the year award for their article entitled “Quality in pediatric anesthesia.”

Launched First of its Kind Telemedicine Program

We launched a telemedicine program in neurophysiological monitoring for orthopedic spine surgery and neurosurgery, the first of its kind for a pediatric anesthesiology department, led by John McAuliffe, MD, MBA, Lisa Francis, DO, and Mohamed Mahmoud, MD. The telemedicine program enabled the neuromonitoring

anesthesiologists to deliver clinical care and bill for services at an outside hospital while at Cincinnati Children's. The program expanded the clinical activity in neuromonitoring by 125 percent, diversified the type of patient and surgical procedures being monitored, and enhanced the skills of the neuromonitoring anesthesiologists.

Major steps in our Training Programs

The ACGME approved our Pediatric Pain Medicine and Palliative Care fellowships, making us unique among children's hospitals to have such advanced fellowship programs. We created a two-year Chinese pediatric anesthesia research fellowship to develop research collaboration with several medical centers in China, led by our program director, Junzheng Wu, MD, and scientists Steve Danzer, PhD, Andreas Loepke, MD, PhD, and Senthil Sadhasivam, MD. We recruited three fellows from Shanghai and Wenzhou to start in FY13.

Division Publications

1. Aronson LA, Hosu LG. **Anaphylaxis**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:84-92.
2. Aronson LA, Hosu LG. **Hypopituitary**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:474-483.
3. Aronson LA, Jou JF, Morillo-Delerme JW. **Mitochondrial Disorder for Muscle Biopsy**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:484-493.
4. Aronson LA, Soler X. **Diabetic Ketoacidosis During Appendicitis with Perforation**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:464-473.
5. Aronson LA, Soler X, G. D. **Liver Transplant**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:262-270.
6. Boat AC, Sadhasivam S. **Congenital Diaphragmatic Hernia Repair**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:551-561.
7. Boat AC, Sadhasivam S. **Myleomeningocele Repair**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:561-572.
8. Boat AC, Sadhasivam S, Loepke AW, Kurth CD. **Outcome for the extremely premature neonate: how far do we push the edge?**. *Paediatr Anaesth*. 2011; 21:765-70.
9. Chidambaran V, Ngamprasertwong P, Vinks AA, Sadhasivam S. **Pharmacogenetics and anesthetic drugs**. *Curr Clin Pharmacol*. 2012; 7:78-101.
10. Chidambaran V, Sadhasivam S. **Foreign Body in the Airway**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:122-130.
11. Chidambaran V, Sadhasivam S. **Obesity** . *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:494-508.
12. Danzer SC. **Depression, stress, epilepsy and adult neurogenesis**. *Exp Neurol*. 2012; 233:22-32.
13. Eastwood CB, Goldschneider KR. **Caudal vs. Penile Block**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:573-581.
14. Eastwood CB, Samuels PJ. **Emergence Agitation**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:681-689.
15. Furstein J, Patel M, Sadhasivam S, Mahmoud M. **Use of dexmedetomidine for monitored anesthesia care for diskography in adolescents**. *AANA Journal*. 2011; 79:421-425.
16. Goldschneider KG, Wittkugel EP. **Laryngospasm**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:131-139.
17. Guite JW, McCue RL, Sherker JL, Sherry DD, Rose JB. **Relationships among pain, protective parental**

responses, and disability for adolescents with chronic musculoskeletal pain: the mediating role of pain catastrophizing. *Clin J Pain*. 2011; 27:775-81.
18. Hagerman NS, Varughese AM. **Preoperative Anxiety Management**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:3-12.
19. Hagerman NS, Wittkugel EP. **Preoperative Fasting in the Pediatric Patient**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:61-72.
20. Hein EA, Margolis JO. **Tonsillar Bleed**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:140-148.
21. Hein EA, Richter GT. **Airway Reconstruction**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:158-167.
22. Istaphanous GK, Loepke AW. **Pulmonary Hypertension**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:341-352.
23. Jankowski MP, Rau KK, Soneji DJ, Ekmann KM, Anderson CE, Molliver DC, Koerber HR. **Purinergic receptor P2Y1 regulates polymodal C-fiber thermal thresholds and sensory neuron phenotypic switching during peripheral inflammation**. *Pain*. 2012; 153:410-9.
24. Jou JF, Margolis JO. **Open Globe Repair**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:353-364.
25. Kibelbek MJ, Aronson LA. **Egg and Soy Allergies and Propofol Use**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:102-112.
26. Konig MW, Mahmoud MA, McAuliffe JJ. **Prone Positioning for Posterior Fossa Tumor Resection**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:365-372.
27. Konig MW, McAuliffe JJ. **Difficult Ventilation during Laparoscopic Fundoplication**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:221-232.
28. Kreeger RN, Spaeth JP. **Muscular Dystrophy**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:631-639.
29. Kreeger RN, Spaeth JP. **Tetralogy of Fallot**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:312-320.
30. Lin EP, Loepke AW. **Cardiac Catheterization**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:321-330.
31. Lin EP, Spaeth JP. **Down Syndrome**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:321-630.
32. Loepke AW, Soriano SG. **Impact of Pediatric Surgery and Anesthesia on Brain Development**. *Pediatric Anesthesia*. Oxford, UK: Wiley-Blackwell Publishing; 2012:1183-1218.
33. Mahmoud MA, Konig MW, McAuliffe JJ. **Spinal Surgery**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:373-381.
34. Mahmoud MA, McAuliffe JJ. **Anesthesia for MRI**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:93-101.
35. Martin D, Wu J. **Cystic Fibrosis**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:202-211.
36. Matveevskii A, Moore DL, Samuels PJ. **Competency and professionalism in medicine**. *Clin Teach*. 2012; 9:75-9.
37. Matveevskii AS, Mahmoud M. **New airway device for ventilation and monitoring in pediatric patients undergoing MRI study**. *J Clin Monit Comput*. 2012; 26:17-20.
38. Meyer MJ, Weidner NJ. **Disclosure After Complication in the OR**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:709-717.
39. Meyer MJ, Weidner NJ. **Do not Resuscitate Orders in the OR**. *Clinical Pediatric Anesthesia: A Case-Based*

Handbook. New York: Oxford University Press; 2012:51-59.

40. Meyer MJ, Weidner NJ. **Oncology Patient**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:412-420.
41. Mishra P, Sadhasivam S, Mahmoud M. **Urgent laparotomy helped resuscitate a neonate with increased intra-abdominal pressure who had cardiac arrest with anesthetic induction**. *J Clin Anesth*. 2012; 24:170-1.
42. Mishra P, Sadhasivam S, Mahmoud M, Soler X. **Tracheal pouch and Murphy eye**. *J Clin Anesth*. 2012; 24:84-5.
43. Moore DL, Goldschneider KR. **Neonatal Epidural**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:582-589.
44. Moore DL, Goldschneider KR. **Pectus Excavatum Repair**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:212-220.
45. Murphy BL, Hofacer RD, Faulkner CN, Loepke AW, Danzer SC. **Abnormalities of granule cell dendritic structure are a prominent feature of the intrahippocampal kainic acid model of epilepsy despite reduced postinjury neurogenesis**. *Epilepsia*. 2012; 53:908-21.
46. Patino M, Varughese AM. **Diabetic Patient**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:453-463.
47. Patino M, Varughese AM. **Osteogenesis Imperfecta**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:661-669.
48. Sadhasivam S, Chidambaran V, Ngamprasertwong P, Esslinger HR, Prows C, Zhang X, Martin LJ, McAuliffe J. **Race and unequal burden of perioperative pain and opioid related adverse effects in children**. *Pediatrics*. 2012; 129:832-8.
49. Saldana SN, Hooper DK, Froehlich TE, Campbell KM, Prows CA, Sadhasivam S, Nick TG, Seid M, Vinks AA, Glauser TA. **Characteristics of successful recruitment in prospective pediatric pharmacogenetic studies**. *Clin Ther*. 2011; 33:2072-81.
50. Samol NB, Wittkugel EP. **Epidermolysis Bullosa**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:650-660.
51. Samol NB, Wittkugel EP. **Upper Respiratory Infection**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:22-31.
52. Samuels PJ, Tomasson J, Kurth CD. **Training and education in pediatric education**. *Pediatric Anesthesia: Basic Principles, State of the Art*. Peoples Medical Publishing House; 2012:2119-2131.
53. Santos VR, de Castro OW, Pun RY, Hester MS, Murphy BL, Loepke AW, Garcia-Cairasco N, Danzer SC. **Contributions of mature granule cells to structural plasticity in temporal lobe epilepsy**. *Neuroscience*. 2011; 197:348-57.
54. Szabova A, Goldschneider KR. **Opioid tolerant Patient**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:421-429.
55. Szabova A, Goldschneider KR. **Sickle Cell Disease**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:393-401.
56. Tomasson J, Mahmoud MA. **Mediastinal Mass Biopsy**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Presss; 2012:430-440.
57. Tran KM, Maxwell LG, Cohen DE, Adamson PC, Moll V, Kurth CD, Galinkin JL. **Brief report: quantification of serum fentanyl concentrations from umbilical cord blood during ex utero intrapartum therapy**. *Anesth Analg*. 2012; 114:1265-7.
58. Varughese AM, Hagerman N, Patino M, Wittkugel E, Schnell B, Salisbury S, Kurth D. **A comparison of inhalational inductions for children in the operating room vs the induction room**. *Paediatr Anaesth*.

2012; 22:327-34.
59. Viola L, Fiadjoe JE, Stricker PA, Maxwell LG. **Video laryngoscopy in infants: one device does not fit all**. *Paediatr Anaesth*. 2011; 21:987-9.
60. Wang J, Richards DA. **Spatial regulation of exocytic site and vesicle mobilization by the actin cytoskeleton**. *PLoS One*. 2011; 6:e29162.
61. Ward CG, Loepke AW. **Anesthetics and sedatives: toxic or protective for the developing brain?**. *Pharmacol Res*. 2012; 65:271-4.
62. Weidner NJ, Cameron M, Lee RC, McBride J, Mathias EJ, Byczkowski TL. **End-of-life care for the dying child: what matters most to parents**. *J Palliat Care*. 2011; 27:279-86.
63. Wu J, Kurth CD. **Bacterial tracheitis vs Epiglottis**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:178-190.
64. Wu J, Kurth CD. **Stridor after Extubation**. *Clinical Pediatric Anesthesia: A Case-Based Handbook*. New York: Oxford University Press; 2012:690-698.

Faculty, Staff, and Trainees

Faculty Members

C. Dean Kurth, MD, Professor
Leadership Anesthesiologist-in-Chief and Chair, Department of Anesthesia

Elena Adler, MD, Adjunct
Leadership Medical Director, Anesthesia Supply Chain, Division of Anesthesia

Nancy Andersen, MD, Adjunct
Lori Aronson, MD, Adjunct
Anne Boat, MD, Assistant Professor
Leadership Director, Fetal Surgery Team, Division of Anesthesia

Vidya Chidambaran, MD, Assistant Professor
Smokey Clay, MD, Assistant Professor
Steve Danzer, PhD, Assistant Professor
Hilary Flint, DO, Assistant Professor
Lisa Francis, DO, Assistant Professor
Kenneth Goldschneider, MD, Associate Professor
Leadership Director, Medical Pain Service and Chronic Pain Clinic, Division of Pain Management

Diane Gordon, MD, Adjunct
Joel Gunter, MD, Professor
Nancy Hagerman, MD, Adjunct
Leadership Co-Medical Director, Same Day Surgery and Pre-Anesthesia Consultation Clinic, Division of Anesthesia

Elizabeth Hein, MD, Adjunct
Liana Hosu, MD, Adjunct
George Istaphanous, MD, Assistant Professor
Michael Jankowski, MD, Assistant Professor
Thomas Kabalin, MD, Associate Professor
Michael "Jack" Kibelbek, MD, Adjunct

Matthias Konig, MD, Assistant Professor
Renee Kreeger, MD, Assistant Professor
Jennifer Lam, DO, Adjunct
Ik Lee, MD, Associate Professor
Leadership Director, Division of Anesthesia

Erica Lin, MD, Assistant Professor
Andreas Loepke, MD, PhD, Associate Professor
Mohamed Mahmoud, MD, Assistant Professor
Alexander Matveevskii, MD, PhD, MEd, Associate Professor
John McAuliffe, MD, MBA, Associate Professor
Leadership Director, Research; Interim Director, Division of Neurobiology

Mark Meyer, MD, Assistant Professor
Leadership Director, Procedure Management, Division of Pain Management

David Moore, MD, Associate Professor
Leadership Clinical Coordinator, Anesthesia Fellow Pain Management Education, Division of Pain Management

Jacquelyn Morillo-Delerme, MD, Associate Professor
Leadership Director of Anesthesia, Liberty Campus, Department of Anesthesia

Pornswan Ngamprasertwong, MD, Assistant Professor
Mario Patino, MD, Assistant Professor
Jayant "Nick" Pratap, MD, Assistant Professor
Joseph Previte, MD, FAAP, Associate Professor
Leadership Director, Information Technology Services, Division of Anesthesia

David Richards, PhD, Assistant Professor
John Rose, MD, Professor
Senthilkumar Sadhasivam, MD, MPH, Associate Professor
Leadership Director, Perioperative Pain Management, Division of Pain Management

Nancy Samol, MD, Adjunct
Paul Samuels, MD, Associate Professor
Leadership Director, Education, Division of Anesthesia

Ximena Soler, MD, Adjunct
Leadership Director, Liver Transplant Surgery Team, Division of Anesthesia

James Spaeth, MD, Associate Professor
Leadership Associate Chief, Department of Anesthesia; Director, Cardiac Anesthesia Team, Division of Anesthesia

Theodore Striker, MD, Professor
Alexandra Szabova, MD, Adjunct
Anna Varughese, MD, MPH, Associate Professor
Leadership Associate Chief, Department of Anesthesia; Director, Quality, Department of Anesthesia; Medical Director, Same Day Surgery and Pre-Anesthesia Consultation Clinic, Division of Anesthesia

Christopher Ward, MD, Assistant Professor
Luigi Viola, MD, Assistant Professor

Norbert Weidner, MD, Associate Professor

Leadership Director, Palliative Care and Comfort Team, Division of Pain Management

Eric Wittkugel, MD, Associate Professor

Junzheng Wu, MD, Assistant Professor

Joint Appointment Faculty Members

Susmita Kashikar-Zuck, PhD, Associate Professor (Behaviorial Medicine & Clinical Psychology)

Anne Lynch-Jordan, PhD, Assistant Professor (Behavioral Medicine & Clinical Psychology)

Clinical Staff Members

- **Clifford Hoffmann, MD**,
  Staff Anesthesiologist

Trainees

- **Travis Bond, MD**, PGY-V, University of Utah, Salt Lake City, UT
- **Veronica Busso, MD**, PGY-V, Johns Hopkins Hospital, Baltimore, MD
- **Manoj Dalmia, MD**, PGY-V, Beth Israel, Boston, MA
- **Sonia Deshmukh, MD**, PGY-V, University of Florida/Shads, Gainesville, FL
- **John Erkmann, MD**, PGY-V, St. Louis University Hospital, St. Louis, MO
- **Jonathan Jerman, MD**, PGY-V, University of Florida/Shads, Gainesville, FL
- **Matthew Keller, MD**, PGY-V, Penn State-Hershey, Hershey, PA
- **Rachel Koll, MD**, PGY-V, University of Utah, Salt Lake City, UT
- **Susan Rooksby, MD**, PGY-V, VA Commonwealth, Richmond, VA
- **Rajeev Subramanyan, MD**, PGY-IX, Hospital for Sick Children, Toronto, Canada
- **William Worden, MD**, PGY-V, Brigam & Women's Hospital, Boston, MA

Division Collaboration

Department of Radiology; Pulmonary Medicine » Blaise Jones, MD, Alan Brody, MD, Raouf Amin, MD, Mohamed Mahmoud, MD, and Mario Patino, MD

Investigative airway dynamics in healthy and obstructive sleep apnea with anesthesia and sedation.

Neurology; Orthopedics » Douglas Rose, MD, Hansel Greiner, MD, Peter Sturm, MD, and John McAuliffe, MD

Investigate anesthetics in neurophysiological signals during surgery.

Emergency Department; Critical Care » Benjamin Kerrey, MD, Kenneth Tegtmeyer, MD, Joseph Luria, MD, Riad Lufti, MD, and Paul Samuels, MD

Investigate learning and competency of intubation skills

Developmental Biology; Neurology » Katherine Holland, MD, Michael Williams, MD, Chris Vorhees, MD, Steve Danzer, PhD, David Richards, PhD, and Mike Jankowski, PhD

Investigate mechanisms of autism and epilepsy

Investigate Neurotransmission

Investigate Chronic Pain

Behavioral Medicine and Clinical Psychology » Anne Lynch-Jordan, MD, Susmita Kashikar-Zuck, MD, and Kenneth Goldschneider, MD

Investigate chronic pain in children

Clinical Pharmacology; Center for Autoimmune Genomics and Etiology; Orthopedics; Human Genetics; Otolaryngology » Sander Vinks, PhD, John Harley, MD, Paul Willging, MD, Peter Sturm, MD, Keijan Zhang, MD, Senthilkumar Sadhasivam, MD, and Vidya Chidambaran, MD

Investigate pharmacogenetics of anesthestics and analgesics

Otolaryngology » Paul WIllging, MD, Anna Varughese, MD, and Nancy Hagerman, MD

Investgate pre-operative factors on postoperative outcomes

Heart Institute » Russel Hirsch, MD and Renee Kreeger, MD

Investigate cerebral oxygenation during congenital heart disease

Heart Institute » Peter Manning, MD and Jayant (Nick) Pratap, MD

Investigate cerebral oxygenation during congenital heart disease

Heart Institute » Thomas Kimball, MD, Foong - Yen Lim, MD, and Pornswan Ngamprasertwong, MD

Grants, Contracts, and Industry Agreements

Grant and Contract Awards		Annual Direct
DANZER, S		
Contributions of Aberrant Granule Cells Integration to the Development of Epilepsy		
National Institutes of Health		
R01 NS 062806	08/05/09-07/31/14	$214,375
Selective Disruption of Hippocampal Dentate Granule Cells in Autism: Impact of PT		
National Institutes of Health		
R01 NS 065020	05/01/09-04/30/14	$283,622
HESTER, M		
mTOR Regulation of Hippocampal Granule Cell Pathology in Temporal Lobe Epilepsy		
Epilepsy Foundation		
	01/01/12-12/31/12	$20,000
JANKOWSKI, M		
Peripheral Mechanisms of Musculoskeletal Pain after Ischemic Tissue Injury		
International Association For The Study of Pain		
	04/30/12-04/30/13	$20,000
PRATAP, J		
Randomized Trial of Near-Infrared Spectroscopy to Guide Intraoperative and Intensive Care Management During Children's Heart Surgery		
Society of Cardiovascular Anesthesiologists		
	07/01/11-06/30/13	$25,000
RICHARDS, D		
Regulation and Mechanisms of Synaptic Vesicle Exocytosis		
National Institutes of Health		
R01 NS 054750	11/09/08-06/30/12	$214,375
SADHASIVAM, S		
Personalizing Perioperative Pain Management in Children: A Multicenter Pharmacogenetic Study		
Thrasher Research Fund		
	04/01/12-03/31/15	$120,000
WARD, G		

Role of Neuronal Maturation in Anesthesia-Induced Apoptosis

Foundation for Anesthesia Education & Research

	07/01/11-06/30/13	$75,000
	Current Year Direct	**$972,372**

Industry Contracts

KURTH, D

Masimo Corporation	$16,738

TOMASSON, J

Nonin Medical, Inc.	$67,179
Current Year Direct Receipts	**$83,917**
Total	**$1,056,289**