Anesthesiology

Division Photo

First Row: J. Wu, G. Istaphanous, V. Chidambaran, C.D. Kurth, M. Baker, K. Vicars, S. Kennedy
Fifth Row: J. Beiersdorfer, J. Tomasson, M. Konig, E. Wittikugel, S. Sadhasivam, M. Everhart

Division Data Summary

Research and Training Details

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number of Faculty</td>
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<td>Number of Joint Appointment Faculty</td>
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<td>Number of Research Students</td>
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<td>Number of Support Personnel</td>
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<td>Peer Reviewed Publications</td>
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Clinical Activities and Training

<table>
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<tr>
<td>Number of Clinical Staff</td>
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<tr>
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<td>Outpatient Encounters</td>
<td>29,579</td>
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Faculty Members

C. Dean Kurth, MD, Professor; Anesthesiologist-in-Chief and Chair, Department of Anesthesiology
Elena Adler, MD, Adjunct Associate Professor; Medical Director, Anesthesia Supply Chain
Nancy Andersen, MD, Adjunct Associate Professor
Lori Aronson, MD, Assistant Professor
Anne Boat, MD, Assistant Professor
Mary Brown, MD, Adjunct Associate Professor
Yvon Bryan, MD, Associate Professor
Steve Danzer, PhD, Assistant Professor
Kenneth Goldschneider, MD, Associate Professor; Director, Division of Pain Management
Joel Gunter, MD, Professor
Nancy Hagerman, MD, Assistant Professor
Elizabeth Hein, MD, Adjunct Assistant Professor; Co-Medical Director, Same Day Surgery and Pre-Anesthesia Consultation Clinic
Clifford Hoffmann, MD, Associate Professor
Liana Hosu, MD, Assistant Professor
Susan Hussein, MD, Assistant Professor
George Istaphanous, MD, Assistant Professor
Fay Jou, MD, Assistant Professor
Thomas Kabalin, MD, Associate Professor
Michael "Jack" Kibelbek, MD, Associate Professor
Matthias Konig, MD, Assistant Professor
Ik Lee, MD, Associate Professor; Clinical Director, Division of Anesthesia
Andreas Loepeke, MD, PhD, Associate Professor
Mohamed Mahmoud, MD, Assistant Professor
John McAuliffe, MD, MBA, Associate Professor; Director, Research
Mark Meyer, MD, Assistant Professor; Director, Procedure Management, Division of Pain Management
David Moore, MD, Associate Professor
Jacquelyn Morillo-Delerme, MD, Associate Professor; Transplant Director, Division of Anesthesia
Joseph Previte, MD, Associate Professor; Director, Information Technology Services
Marnie Robinson, MD, Assistant Professor; Director, Fetal Surgery Anesthesia, Division of Anesthesia
Senthilkumar Sadhasivam, MD, Assistant Professor
Paul Samuels, MD, Associate Professor; Director, Education
Thomas "Mike" Shackleford, MD, Assistant Professor
Ximena Soler, MD, Assistant Professor
James Spaeth, MD, Associate Professor; Director, Cardiac Anesthesia, Division of Anesthesia
Theodore Striker, MD, Professor; Director, Outpatient Mason, Division of Anesthesia
Alexandra Szabova, MD, Assistant Professor
Jon Tomasson, MD, Assistant Professor
Kevin Tomfohrde, MD, Assistant Professor
Anna Varughese, MD, MPH, Associate Professor; Associate Director, Quality, Division of Anesthesia
Deborah Vermaire, MD, Associate Professor; Director, Quality, Division of Pain Management
Norbert Weidner, MD, Associate Professor; Director, Palliative Care, Division of Pain Management
Eric Wittkugel, MD, Associate Professor; Co-Medical Director, Same Day Surgery and Pre-Anesthesia Consultation Clinic
Junzheng Wu, MD, Assistant Professor

Joint Appointment Faculty Members
Susmita Kashikar-Zuck, PhD, Associate Professor
Behavioral Medicine & Clinical Psychology
Anne Lynch-Jordan, PhD, Assistant Professor
Significant Accomplishments in FY08

Division of Anesthesia

In the Division of Anesthesia, our emphasis in FY 2008 centered on safety and quality initiatives.

In FY 2008, the Department continued to place emphasis on reducing serious events. We experienced a reduction in the serious event rate in the latter half of the year due to improvement in our reporting system, analyses of events and communication within the Department regarding such events. Lastly and more importantly, we have developed standard operating procedures (SOPs) in those areas susceptible to these events.

A key initiative of Periopertive Clinical Systems Improvement (CSI) team is optimization of the ENT perioperative/surgical care through standardization of pre-, intra-, and post-operative processes. A crucial component of starting on time is timely anesthesia pre-medication. To that end, the Department set a goal of 95% on-time pre-medication for the first cases of the day. Our baseline data in June 2007 indicated we were only 56% successful in administering timely, pre-anesthesia medications. Over the course of the year, we modified our workflow and developed an algorithm to help drive early decisions for pre-medication. Through strong and sustained improvement efforts we achieved our goal of 95% success with timely pre-medication. For FY 2009, we will focus on spreading this process flow to the subsequent cases.

Division of Pain Management

The Pediatric Palliative and Comfort Care Team (PACT), and the Procedural Management section of the Division have blossomed into crucial aspects of care at CCHMC. Patients of the Hematology-Oncology Division have come to rely of the services of the Palliative Care team for comfort both as inpatients, as well as at the end of life. A small, tightly-knit inpatient team provides supportive continuity of care with the pharmacologic and therapeutic expertise found only in those with extensive experience in the care of this patient population. When these patients undergo diagnostic and therapeutic procedures, many of which are painful, the Procedure Management team provides sedation and anesthesia to get the patients through these frequent and distressing procedures. Family and primary service feedback has been very positive. In fact, the services provided by the Division are cited by families as among the reasons they have transferred their care to CCHMC from outside institutions. The interdisciplinary efforts between the Divisions of Hematology-Oncology and Pain Management are exemplary in their productivity, efficiency, collegiality and family focus.

Without assessment and documentation, services can not be improved. To ensure the highest level of clinical efficacy and safety, the Division of Pain Management has developed a Quality Assurance scorecard, to assess all four sections of the Division (Chronic Pain Clinic, Acute Pain Service, Procedure Management and PACT). The data that is collected is used for continuous improvement, and is being prepared for publication. The Pain and Anesthesia literatures have little QA-based data, and the Division is positioning itself to take a leadership role nationally in this area of practice management.

Division of Neurobiology

Laboratory Research
In Fiscal Year 2008, Steve Danzer, PhD continued his work examining how neurological and genetic lesions disrupt brain development, specifically the development and integration of hippocampal dentate granule cells. His laboratory will further this research in the coming year through collaboration with the arrival of Dave Richards, PhD, who brings an additional perspective to already successful research.

Drs. Andreas Loepke and George Istaphanous, with the support of the Foundation for Anesthesia Education and Research (FAER), focus on the detection and prevention of neonatal brain injury with special emphasis on congenital heart disease, as well as anesthesia-induced developmental neuroapoptosis. Their utilization of many tools and techniques, such as transgenic animals and confocal microscopy allow them to produce international results.

**Clinical Research**

After receiving approval of his Investigational New Drug (IND) application, Dr. Mohamed Mahmoud began investigating the pharmacology of Dexmedetomidine in specialized applications in the MRI setting, particularly how to optimize the anesthetic regime that is used in children and adolescents that have a history of obstructive sleep apnea. Furthermore, Dr. Mahmoud is using his IND to understand the effects of Dexmedetomidine on neuromonitoring techniques. Each of these studies can identify a unique way to utilize the drug that will lead to a positive outcome for the patient and procedure results.

Drs. John McAuliffe and Senthilkumar Sadhasivam received a Trustee Award to investigate the relationship between an individual's genotype and their analgesic requirements following a painful procedure and the likelihood of side-effects following treatment of pain with narcotic analgesics, specifically morphine. This study also looks at two new possible procedures for measuring pain through 1) pupil dilation readings which are proven to correlate well with narcotic levels and 2) CO2 readings to monitor respiratory depression and its relationship to narcotic levels.

Dr. Senthilkumar Sadhasivam’s Foundation for Anesthesia Education and Research (FAER) study aims at developing and validating the Preoperative Adult Child Behavioral Interaction Scale (PACBIS) assessment tool. This is a real-time tool that will help clinicians better understand how behavioral factors affect postoperative outcomes in children following outpatient surgery.

**Significant Publications in FY08**


We demonstrated that adult-born cells contribute to brain pathology in epilepsy.


Brain cell death following anesthetic exposure, as observed in animal models, has led to serious questions regarding the safety of pediatric anesthesia. This article reviews the pertinent data available in animal models, it examines the possible evidence for this phenomenon occurring during human anesthesia practice, and critically discusses the applicability of experimental models to clinical pediatric anesthesia. Despite abundant evidence for anesthesia-induced neurotoxicity in animals, only anecdotal evidence exists for neurological impairment in children following exposure to surgery and anesthesia early in life. Significant differences exist between the experimental conditions and clinical anesthesia practice.


Preoperative factors predicting poor behavioral compliance on anesthetic mask induction may identify children who could benefit from interventions in the preoperative clinic to reduce anxiety. Age, history of previous anesthesia, preoperative tour attendance, preoperative preparation time and anxiety state levels in preoperative clinic demonstrated a strong relationship to poor behavioral compliance on induction. Race, gender, type of procedure, ASA class, midazolam premedication, and number of hours fasted demonstrated no relationship to poor behavioral compliance.

McAuliffe JJ, Joseph B, Vorhees CV. Isoflurane-delayed preconditioning reduces immediate mortality and improves striatal function in adult mice after neonatal hypoxia-ischemia. Anesth Analg. 2007 104:1066-77

The volatile anestheticIsoflurane when administered 24-hours prior to a hypoxic ischemic insult provides protection to certain circuits in the brain. In addition, it can also reduce the immediate mortality that normally follows such an

Little is known about how children of either gender cope with chronic pain. We demonstrated the early emergence of sex- and aged-based preferences in coping strategies among children and adolescents with chronic pain. Boys use more distraction-type modalities while girls utilize social support mechanisms, while coginitive strategies emerge during adolescence. These findings establish a basis for further research on early social influences in the development of pain coping styles in males and females.

### Division Highlights

**Anna M. Varughese, MD, MPH**
Comparison of Two interventions for Inhalational Induction in Children: A QA Improvement Study.

**Mohamed Mahmoud, MD**
Effects of Increasing Depth of Dexmedetomidine.

**Junzheng Wu, MD**
A Qualitative comparison of Two Anesthetic Technique in Children Undergoing Magnetic Resonance Imaging.

**Michael Shackleford, DO**
Comparison of Sedation and Anesthesia Techniques for MRI in Infants.

**Senthilkumar Sadhasivam, MD, MPH**
PACBIS 3 - Correlating Postoperative Behavioral Outcomes with Perioperative Adult Child Behavioral Interaction Scale.

**Andreas W. Loepke, MD, PhD**
Neuroprotection of the Neonatal Brain

**John J. McAuliffe, III, MD, MBA**
Improving Pediatric Pain Management with neuro genomics-understanding the genetic response to morphine following surgery using genetics.

**Steve Danzer, PhD**
Granule cell disruption in the development of epilepsy and autism.

### Mentions in Consumer Media


### Division Publications


Grants, Contracts, and Industry Agreements

Grant and Contract Awards

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| Total               | $150,000 |