Chairperson’s Report

Rita Agarwal, MD, FAAP

I feel so honored to have had the opportunity to serve as your Chair for the past 2 years. It has been such an amazing, educational and inspirational experience. We have a remarkable group of people in the Section, and I urge you all to get involved, stay involved and make a difference. The AAP is an organization that is different than most other medical societies and organizations. Its mission is to ensure the “optimal physical, mental, and social health and well-being for all infants, children, adolescents, and young adults”. Most other organizations see their members as their primary stakeholders, and their mission revolves around serving those member’s needs, assuming of course that by helping their members they will also help patient outcomes. Because of its singular focus, CHILDREN, the AAP has created a home for physicians from a myriad of specialties and provides a forum for people who are passionate about children’s health to meet, connect, network, discuss, negotiate and most importantly learn. I am so proud to be a member of this amazing group of physicians and most particularly proud of our incredible Section. We are a force to be reckoned with!

Dr. Raeford Brown will be taking over as Chair in November 2017. He brings a wealth of experience and passion to the cause of children’s health, children’s pain management and children’s anesthesia. He is the current Chair of the FDA Advisory Committee on Anesthesia and Analgesia and has been involved with several major initiatives that impact the Pediatric Anesthesiology community including: the national response to the Opioid Crisis, the FDA Drug Safety Communication on General Anesthetics and Sedation Drugs in Young Children and Pregnant Women, and the national controversy over the safer provision of dental sedation. You have chosen Dr. Anita Honkanen to be our next Chair Elect; Dr. Stephan Hays will be taking over her position on the Executive Committee. Read more about these emerging section leaders on page 5.

Below you will find a summary of recent section activities that I hope will give you a snapshot of all that we have been working on and much of what is to come in the near future.

EDUCATION

Policy Statements and Clinical Reports

The Section has continued its multifranged approach towards education including the writing and publishing of Policy Statements and Clinical Reports for all physicians and other professionals caring for children. These include:

• AAP/American Academy of Pediatric Dentistry (AAPD) “Guidelines for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016” – Published in 2016
• “Codeine: Time to Say No” a joint report with the AAP Committee on Drugs – Published in 2016

The Section is currently working on the following:

• A revision of the statement on “The Assessment and Management of Acute Pain in Infants, Children, and Adolescents” – authored by Drs. Corrie Anderson and Nathalia Jimenez. The draft is complete and has been approved by the SOA; it is currently being reviewed by other AAP Committees, Councils and Sections.

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• A new statement on “Care of Pediatric Patients with Chronic Pain” to be co-authored by Drs. Kenneth Goldschneider, Sabine Kost-Byerly and Raeford Brown

• A revision of the clinical report, “Interpretation of Do-Not-Attempt-Resuscitation and Resuscitation Limitation Orders for Pediatric Patients Who Require Anesthesia and Surgery,” a joint effort with the Section on Surgery and the Committee on Bioethics is undergoing its final reviews and has been co-authored by Dr. Courtney Hardy

• A new clinical report on “Perioperative Management of Children with Sleep Disordered Breathing/Obstructive Sleep Apnea,” a joint effort with the Section on Otolaryngology; co-authored by Drs. Anita Honkanen and Vidya Raman.

• A new clinical report on “Oxymetazoline (Afrin®): Considerations for Pediatric Use,” another joint effort with the Section on Otolaryngology; co-authored by Drs. Joseph Tobias and Richard Carabuke

• The Section is currently working on an intent for a new manual on Pediatric Airway Management. Please contact Dr. Joseph Tobias if interested

Webinars, Online Modules and Live Events

• Providers’ Clinical Support System for Opioid Therapies Grant from SAMHSA: http://pcss-o.org/. Since the summer of 2015 there have been 6 webinars produced by the Section and the AAP Committee on Substance Use and Prevention. These webinars are aimed at prevention, identification, and treatment of opioid dependence. They are designed for primary care health care providers, but all clinicians are welcome to view them. They are really excellent and worth a look (the webinars are archived at: https://www.aap.org/en-us/about-the-aap/Committees-Councils-Sections/substance-use/Pages/PCSS-O.aspx). The webinars are free but payment is required for CME. I personally found the webinars on Co-Occurring Psychiatric Illness and Substance Abuse to be terrifying; as the mother of children with ADHD, the message was crystal clear and very disturbing. We now have a locked cabinet in our house for all controlled substance prescriptions, do you?

• For anyone interested in either getting training in prescribing Buprenorphine, and/or getting the Buprenorphine certificate, there is an 8 hour FREE course for all AAP members. I have it downloaded, but haven’t quite found the time to go through the course. I will get to it as soon as my term as Chair comes to an end – maybe . To access the course, log in with your AAP ID and password at this link: http://tinyurl.com/y87d9yct

• Acute Pain Management Online Learning Module (Pedialink®) 2016-2019. This module is written for pediatricians and pediatric subspecialists. Members and non-members of the AAP are encouraged to take the course; for most pediatric anesthesiologists this is an easy CME credit that can help fulfill licensing requirements (opioid prescribing education) that is pediatrics specific. For more information, see page 8.

• This year a new Pedialink module was approved and has just been launched. It focuses on what pediatricians need to know about chronic pain management in children in the face of the opioid crisis and is authored by Drs. Robert Wilder and Nisha Kandiah. For more information, see page 8.

• The National Conference and Exhibition (NCE) is the major annual meeting of the AAP. It is notoriously difficult to get sessions accepted as its proposal process is open to all Sections, Councils, and Committees of the AAP. Many of our surgical and other specialty colleagues have individual programs affiliated with the bigger meeting. There is a preconference every year called Peds21: Pediatrics for the 21st Century that focuses on cutting edge topics and is usually accompanied by a great deal of publicity and media coverage. Here are some of our recently accepted sessions:

  • “Hot Topic” session at the annual National Conference and Exhibition (NCE) in 2016: “Babies, Anesthesia and the Developing Brain” by Dr. Lisa Wise-Faberowski
  • “Integrating Acupuncture into Pediatric Practice” with Dr. Yuan Chi Lin, 2016 & 2018
  • “The Opioid Crisis: Implications for Pediatric Pain Management” by Drs. Samanthan Suresh and Ravi Shah, 2017
  • “Anesthesia in Young Children: Do We Need to Be Worried?” by Dr. Ravi Shah, 2017
  • “What Every Pediatrician Needs to Know About the Risks of Anesthesia to Infants and Children” to be presented by Dr. Lisa Wise-Faberowski, 2018
  • The SOA is currently planning a half-day joint program with the Section on Critical Care to be presented at the 2018 NCE. Stay tuned for more on this, especially if you live near Orlando where the 2018 NCE will take place. We hope that SOA/SPA members will consider attending.
  • “Opioids Through the Ages: The Good the Bad and the Ugly” has been accepted as the topic for Peds-21 in 2019, a huge accomplishment for our Section; we look forward to planning this session!

• Currently working with the SPA Education Committee to help develop the 2018 SPA/AAP Pediatric Anesthesiology Meeting.
  • Robert M Smith Award: Dr. Robert Friesen, Children’s Hospital of Colorado. See page 11 for more information about our 2018 award winner.
  • AAP Advocacy Lecture: “Unique Healthcare Challenges in Immigrant and Refugee Children” by Dr. Arturo Gonzalez
  • AAP Ask the Experts Panel:
    - Button Battery Ingestion: Be Scared, be Very Very Scared by Dr. Debnath Chatterjee
    - The Pediatric Difficult Airway: Tales of Terror by Dr. John Fiadjo

ADVOCACY

The ongoing initiatives of the AAP Section on Anesthesiology & Pain Medicine continue to focus on the improved health and well-being of pediatric patients of all ages. The SOA works closely with the SPA, ASA and FDA to provide information to families, physicians and other health care professionals on the safe use of anesthesia and sedation in young children, the opioid crisis, and dental anesthesia.

FDA Warning and Labeling on Anesthesia Neurotoxicity in Developing Brains

• FAQ’s have been published on the AAP’s Healthy Children Website addressing questions regarding the safe use of anesthetics and sedatives in young children. Anesthesia Safety in Infants and Toddlers

• Drs. Raeford Brown and Rita Agarwal recently wrote an article on the FDA Drug Safety Communication on General Anesthetics and Sedation Drugs in Young Children and Pregnant Women for AAP News. AAP Responds to FDA warning on anesthesia

• The AAP Surgical Advisory Panel, an expert panel made up of the Chairs of each of the surgical sections within the AAP, has established a Subcommittee on Optimal Timing of Surgery, to try to better delineate the appropriate time for surgery/procedures in children.

• Drs. Houck, Agarwal, and Brown recently reviewed an article for AAP News looking at the FDA Drug Safety Communication on General Anesthetics and Sedation Drugs in Young Children and Pregnant Women that address medico-legal aspects for pediatricians. The article, “FDA warning on anesthesia calls attention to malpractice risks associated with medications, failure to timely refer” was just published on September 27, 2017, and

(Continued on page 3)
Opioid Crisis

- A Resolution was passed at the 2017 AAP Annual Leadership Forum (ALF) to Promote Safe Storage and Disposal of Leftover Opioids and other Controlled Substances
  - Creation of an educational poster for dissemination at the NCE (for more information, see page 18)
  - Brainstorming other ideas to educate families and clinicians
  - Proposing a series of articles in AAP News with members of the AAP Committee on Substance Use and Prevention.
- AMA Opioid Taskforce involvement
- Authored AMA Resolution 515 “Safe Use, Storage and Disposal of Leftover Opioids and Other 24 Controlled Substances” which was adopted with minor amendments (https://www.ama-assn.org/sites/default/files/media-browser/public/hod/a17-recommreport-updated.pdf)
- Educational Initiatives Described Above (Pedialink Online Modules, and NCE Sessions, including 2019 Peds-21)

Dental Anesthesia Safety

- A resolution titled “Not One More Child Should Die in a Dental Chair: Remembering Caleb,” was passed at the AAP ALF in 2017. The SOA co-sponsored the resolution with the authoring entity, AAP District IX (California).
- SOA leaders have worked with AAP District IX (California) and the California Society of Anesthesiology to advocate at the state level for safer sedation and anesthesia guidelines for dental practices – see Caleb’s Law: http://www.calebslaw.org. For more information on this, see page 4.
- New information added to HealthyChildren.org: Anesthesia or Sedation for your Child’s Dental Work?

Calling for newsletter articles for our next issue, the Spring 2018 edition.

Please send article ideas to Newsletter Editor, Mary Landrigan-Ossar at Mary.Landrigan-Ossar@childrens.harvard.edu.

Has Your Work Been Highlighted in a Recent News Article?

We are hoping to feature SOA “Members in the News” in upcoming editions of this newsletter.
If you have an article to share, please don’t be shy! We would love the opportunity to showcase the work that members of our AAP Section are involved in on a daily basis.
Help us with this effort by submitting your update to Mary Landrigan-Ossar.
Pediatric Dental Sedation & Safety in the News; AAP Reacts

In July 2017, NBC aired an in-depth investigation on the issue of safety in pediatric dental anesthesia cases. The story examined a series of tragic outcomes where children underwent anesthesia in a dental office. As part of the broadcast, the need for tighter standards that better reflect the standard of care seen in medical settings was discussed. Take a look at the coverage of this issue from July 9, 2017 on “Sunday Night with Megyn Kelly” and the following morning on “The Today Show”.

Section Member, Charlie Coté, has long been the voice of pediatric patient safety in this discussion. As the lead author of the AAP’s joint statement with the American Academy of Pediatric Dentistry (AAPD), “Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016,” he is an advocate for regulations that prevent the single operator model — where one person is in charge of both the procedure and the anesthesia. Dr. Coté and other members of the AAP Section on Anesthesiology and Pain Medicine, including Chair, Rita Agarwal, and Chair-Elect, Rae Brown, have actively been speaking out against the single operator model in recent months. The practice model endorsed by the AAP and the American Academy of Pediatric Dentistry (AAPD) for deeply sedated children (i.e., no purposeful interaction) is one in which a specific person has dedicated responsibility “to constantly observe the patient’s vital signs, airway patency, and adequacy of ventilation and to either administer drugs or direct their administration and at a minimum be trained in PALS (Pediatric Advanced Life Support) and capable of assisting with any emergency event.”

In reaction to the recent press on this topic, the SOA authored an article summarizing its position and some recent advocacy activities focused on pediatric dental sedation safety, which was published in AAP News in August 2017 (see page 6 to view the article). In addition, the Section has added a patient education page, “Anesthesia or Sedation for Your Child’s Dental Work?” on HealthyChildren.org, the AAP’s website for parents.

So what now? How to follow two superstars? Well, first by enticing both to continue the work that they have started. There is no rest for the weary. Second, by working with Section Manager, Jen Riefe, to make certain that all of the projects that have been started in the last three years are finished. But, in addition, we need to continue to grow as a section and that is where I will be focusing my attention over the next two years. There are many other divisions and sections within the AAP that we can work with to educate our colleagues and the public about the need for well-trained pediatric anesthesia and pain medicine providers. This will be lateral growth in our section, and it is important to the long-term health of the organization. Solidifying our developing relationships with the SPA, the Society for Pediatric Pain Medicine, and the Pediatric Anesthesiology Committee of the ASA will similarly help us to grow.

In addition, we must help the entire community of pediatric anesthesiology care providers understand the importance of supporting children and the role that becoming a member of the AAP plays in advocacy efforts. You will hear more from me about this in the next several years.

I have a wonderful group to work with. Anita Honkanen from Stanford will be the Chair-Elect, and I plan to put her energy and smarts to work for the section. The executive committee is stellar and with the addition of Stephen Hays from Vanderbilt will, I am certain, help me to continue the good work that has been done before.

Rae Brown, MD, FAAP
Rbrow1@email.uky.edu
Section Leadership Announcements

Dr. Anita Honkanen Selected as 2017-19 Section Chairperson-Elect

Dr. Anita Honkanen, who has served as a Section Executive Committee member since 2013, will transition into the role of Chairperson-Elect on November 1, 2017. Dr. Honkanen will assume the role of Chair-Elect as Dr. Rae Brown steps into the position of Chairperson and as Dr. Agarwal becomes Immediate Past Chairperson. Dr. Honkanen will serve two years as Chair-Elect, taking over as Section Chairperson in November 2019.

About Our New Chairperson-Elect:
Dr. Anita Honkanen is currently the Chief of Pediatric Anesthesiology and Pain Medicine at Stanford University where she has been practicing in pediatric anesthesiology since 2003. She completed her medical training at Tufts University School of Medicine, followed by nearly 4 years on Active Duty in the Army, residency training at the Massachusetts General Hospital in Boston, and 6 months of focused time in Pediatric Anesthesiology at Boston Children’s Hospital. After 4 years in research and clinical care at Massachusetts General Hospital, primarily in pediatrics and obstetrics, she spent 4 years in private practice. She completed a Masters of Science degree in Health Services Research at Stanford, with a goal of developing a better understanding of the use of resources for pediatric perioperative and surgical care and the effects of policies on the delivery of pediatric surgical care.

She helped develop the in-situ pediatric simulation models used at Lucile Packard Children’s Hospital and now at other institutions, and assists with MOCA simulation courses for ABA recertification. Her current research interests relate to perioperative systems of care and outcomes for pediatric surgery and anesthesia.

She has been a member of the Executive Committee of the AAP Section on Anesthesiology and Pain Medicine since 2013, was a member of the ASA COPA from 2014 through 2016, and will be assisting as a site surveyor for the American College of Surgeons’ Children’s Surgery Verification Program. She is the mother of 5 children and lives with her family in Palo Alto.

Dr. Stephen Hays to Join Section Leadership Team as Executive Committee Member

Please join us in welcoming Dr. Stephen Hays to the Section leadership. Effective November 1, 2017, Dr. Hays will take on the responsibilities of a Section Executive Committee Member, assuming Dr. Honkanen’s open position as she transitions into the role of Chair-Elect. Dr. Hays’ first term will come to an end on November 1, 2019, and he will be eligible for re-election to a second term at that time.

About Our New Executive Committee Member:
Dr. Hays is currently an Associate Professor of Anesthesiology & Pediatrics at Vanderbilt University Medical Center, and an attending pediatric anesthesiologist at Monroe Carell Jr. Children’s Hospital at Vanderbilt. A native of Syracuse, NY and Presidential Scholar, he earned simultaneous B.S. / M.S. in Molecular Biophysics & Biochemistry summa cum laude with Distinction in the Major from Yale University, New Haven, CT where he was elected to membership in Phi Beta Kappa. He earned his M.D. from The Johns Hopkins University School of Medicine, Baltimore, MD where he remained for Internship & Residency in Pediatrics, Residency in Anesthesiology & Critical Care Medicine, and Fellowships in Pediatric Anesthesia & Pediatric Critical Care Medicine. He then moved to Nashville, TN to join the faculty in Anesthesiology & Pediatrics at Vanderbilt University Medical Center.

He is a Fellow of the American Academy of Pediatrics, a member of the American Academy of Pediatrics Sections on Anesthesiology & Pain Medicine, Critical Care Medicine, and Hospice & Palliative Medicine, and a member of the American Society of Anesthesiologists Committees on Pediatric Anesthesiology and Hospice & Palliative Medicine. He is Board-Certified in Pediatrics, Pediatric Critical Care Medicine, Anesthesiology, Pediatric Anesthesiology, and Hospice & Palliative Medicine. He regularly gives institutional, regional, and national lectures on a variety of subjects pertaining to pediatric anesthesia and pediatric pain management, and serves as a Senior Examiner for the American Board of Anesthesiology. He also serves on the Standardized Oral Exam Writing Committee and OSCE Task Force of the American Board of Anesthesiology, as well as the Membership & Internal Communications Work Group of the American Academy of Pediatrics Section on Hospice & Palliative Medicine. He received a 2004-2005 Vanderbilt Department of Anesthesiology Golden Apple Award for Excellence in Teaching, as well as the 2011 Sandidge Pediatric Pain Management Award in Recognition of Outstanding Contributions to Pediatric Pain Management at Monroe Carell Jr. Children’s Hospital at Vanderbilt. He currently lives in Nashville with his wife, Deborah Single; they have two sons, Matthew Stephen & Timothy William.

His current research interests include NIH-funded and foundation-sponsored multi-center collaborative studies of potential neurodevelopmental toxicity of pediatric anesthesia, as well as industry-sponsored pharmaceutical licensing studies of analgesic agents in children.

His current clinical practice focuses on perioperative care of children of all ages, with particular interests in pediatric regional anesthesia and pediatric pain management. His clinical time is divided between the operating room and the pediatric pain service, including coverage of pediatric pain clinic.

New Article: Key Considerations for Improving the Pediatric Primary Care and Specialist Interface

An article in the Journal of Pediatrics titled, “The Pediatric Primary Care-Specialist Interface: A Call for Action” outlines key considerations and solutions for improving relationships between pediatric primary care and subspecialists. The article summarizes key components of the family-centered medical home, including access, communication, coordination, and family-centered care, and provides solutions for enhancing the pediatric primary care and specialist relationship in the context of these components. Successful collaborative care models that can be replicated in other states and health care settings are also described.
Guidelines evolving for safe pediatric sedation in dental offices

by Mary Landrigan-Ossar, M.D., Ph.D., FAAP; Charles J. Coté, M.D., FAAP

In 2015, 6-year-old Caleb Sears of California stopped breathing and died following administration of general anesthesia prior to a tooth extraction in a dental office.

The deaths of healthy children during outpatient procedures represent "never events." However, sedation disasters in the dental office are being reported in the national news every few months. Recently, there have been several encouraging developments in the effort to reduce the number of these events to zero.

One issue identified repeatedly as problematic is appropriate training and staffing during procedures where deep sedation and/or general anesthesia is the therapeutic goal. The practice model endorsed by the Academy and the American Academy of Pediatric Dentistry (AAPD) for deeply sedated children (i.e., no purposeful interaction) is one in which a specific person has dedicated responsibility "to constantly observe the patient's vital signs, airway patency, and adequacy of ventilation and to either administer drugs or direct their administration and at a minimum be trained in PALS (Pediatric Advanced Life Support) and capable of assisting with any emergency event" (Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016 (http://pediatrics.aappublications.org/content/early/2016/06/24/peds.2016-1212).

To fulfill these requirements in hospital-based settings, this person is at least a nurse or midlevel provider, if not another physician. The Pediatric Sedation Research Consortium uses this model for a trained hospital sedation team with an excellent safety record (Kamat PP, et al. Pediatr Crit Care Med. 2015;16:11-20).

The situation in some dental offices is worrisome given the considerable state-to-state variability in anesthesia requirements in the dental setting. Most states allow a "single-operator" model in which a dentist holding a state-issued anesthesia permit may administer sedatives/anesthetics and perform the dental procedure. Often, the person monitoring the patient under sedation is a dental assistant whose training varies from state to state and who may have no more than a high school diploma and a certificate course.

This leads to a troublesome scenario in which a single-operator anesthesia/sedation provider is caring for a child who develops laryngospasm or airway obstruction requiring bag-mask ventilation and possible intravenous medications. The provider has to attempt to establish air exchange, but the dental assistant is unable and unqualified to insert an intravenous catheter or perform resuscitation. The single-operator anesthesia/sedation provider now must make a decision to stop providing bag-mask ventilation with the hope that he/she can rapidly establish venous access and provide resuscitation, then go back to providing ventilatory support.

Recent developments may help usher out this dangerous practice model. California legislators are debating a bill championed by AAP District IX that would prohibit single-operator sedation in pediatric dental practice. Referred to as Caleb's Law, the bill also would require data collection of dental deaths or need for transfer to a hospital for emergency support, which have not been systematically collected.

The AAPD recently made a significant clarification to its Guideline on Use of Anesthesia Providers in the Administration of Office-Based Deep Sedation/General Anesthesia to the Pediatric Dental Patient. The 2012 guideline was changed to state that deep sedation or anesthesia requires licensed anesthesia providers who are separate from the operating dentist. With time, this guideline may prompt change at the state regulatory level.

At the 2017 Annual Leadership Forum, AAP leaders ranked "Not One More Child Should Die in a Dental Chair: Remembering Caleb" as one of its Top 10 resolutions. The Academy, as a powerful voice for pediatric safety, will be vital in continuing efforts to change legislation, practice and payer willingness to subsidize this change.
New AAP Academic and Subspecialty Advocacy Report


The Report contains updates on the following topics:

- Access to Care
- Children’s Health Insurance Program
- Current Health Reform Proposals
- ACE Kids Act
- Medical Foods Coverage
- Academic and Subspecialty Workforce
- Support for Pediatric Subspecialists
- Children’s Hospital GME Funding and Reauthorization
- Defense Department Subspecialty Training
- Public Service Loan Forgiveness
- International Physician Legislation
- Immigration Policy
- Physician Payment
- Medicaid Payment Equity
- Pediatric Drugs and Devices
- Pediatric Drug Laws
- Pediatric Device Consortia Program Appropriations
- 21st Century Cures Act
- Opioids and Children
- FDA Approves Label Changes for Use of General Anesthetic and Sedation in Young Children
- Restricted Use of Codeine and Tramadol
- Pediatric Research
- National Institutes of Health Appropriations
- Precision Medicine Initiative
- Environmental influences on Child Health Outcomes (ECHO)
- Inclusion of Children in NIH-Funded Research
- Cancer “Moonshot” Initiative
- Indirect Costs in NIH Grants
- Budget and Appropriations
- Fiscal Year 2017 Appropriations
- President’s Fiscal Year 2018 Budget
- Fiscal Year 2018 Appropriations
- Emergency Medical Services for Children
- Federal Aviation Administration Emergency Medical Kits
- Protecting Patient Access to Emergency Medications Act
- AAP Blueprint for Children
- Grassroots Advocacy: AAP Key Contact Program
- How to Become a Key Contact
- FederalAdvocacy.aap.org: Dept. of Federal Affairs Online Resource Center
- Engage with AAP on Social Media

Transitions – Innovation @ AAP

As an SOA member, you may not always take note of the good work going on across the AAP that doesn’t directly affect your day-to-day practice. Nonetheless, it’s good for us to be aware of innovative AAP projects like the one described below.

The AAP Transition ECHO serves as a forum for health care professionals to learn how to successfully transition youth from pediatrics to the adult care system. This project uses the ECHO (Extension for Community Healthcare Outcomes) model TM, a tele-mentoring hub and spoke platform that leverages technology to bring together specialty care providers at academic medical centers (hub) and primary care providers in local communities (spokes). The AAP Transition ECHO builds a bi-directional virtual knowledge network whereby participants learn from experts and each other, gaining access to evidence-based and capacity-building resources. Each clinic includes a brief presentation by a national transition expert, followed by in-depth, practice-based presentations for discussion, problem-solving guidance and recommendations. All attendees are invited to share and actively participate. Through regular attendance, participants will use quality improvement techniques to support planning and transfer of care to ensure that all youth and young adults, including those with epilepsy, successfully transition into adult care.
NEW!!! Chronic Pain and the Opioid Crisis

Before we begin to explore the management of chronic pain, it is critical that we first recognize that opioids have become a crisis across the country. Since the turn of the century, opioid prescriptions have skyrocketed, largely because of increased use of opioids in the management of chronic, noncancer pain. This emerging problem was first identified in the late 1990s and, though it has started to taper off somewhat, each year opioids are responsible for millions of emergency room visits, thousands of deaths, and billions of dollars of costs in the US economy.

Learning Objectives
• Learner should be able to understand what chronic pain is, and understand the types of chronic pain you’re likely to see in your practice.
• Learner should be able to understand the goals and the approach to the treatment of chronic pain.
• Learner should be able to understand the role of opioids in the treatment of chronic pain and CDC recommendations for opioid therapy in the chronic pain population.

Course Authors
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Nisha Kandiah, MD

Reviewers
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Yuan Chi Lin, MD

Credit Information
AMA PRA Category 1 Credit(s)™: 1.00
AAP Credit: 1.00
NAPNAP Credit Contact Hours: 0.5
Pharmacology Rx: 0.5

Registration Fees
AAP Member: $0 • Non-Member: $0

Acknowledgments
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To access the course, visit: https://shop.aap.org/chronic-pain-and-the-opioid-crisis/

Acute Pain Management: Changes and Challenges

The main goals of this course are to increase the number of pediatricians who understand how to assess and treat pain as well as how to identify patients at risk for misusing and abusing opioid medications.

Case studies presented in this course provide the opportunity to apply the pain screening and management techniques to patient and family case situations. After completing this course, you will be able to:

• Identify appropriate pain assessment tools for children of different ages.
• Select scales that may be used in cognitively impaired children.
• List current dosing guidelines and recommendations for analgesic medications.
• Describe common clinical factors that may influence opioid dosing.
• Identify considerations for treating acute pain in children at increased risk of developing adverse events.
• Recall the origins and scope of the opioid crisis in the United States.
• Review guidelines on the proper use of opioid analgesia.
• Use tools to screen for substance use.
• Discuss management of opioid misuse.
• Recognize when to enlist the help of substance use specialists.

Faculty
Rita Agarwal, MD, FAAP
David Casavant, MD, FAAP

Credit Information
AMA PRA Category 1 Credit(s)™: 1.00
AAP Credit: 1.00
NAPNAP Credit Contact Hours: 1.00
Pharmacology Rx: 0.25

Registration Fees
AAP Member: $24 • Non-Member: $29

To access the course, visit: http://shop.aap.org/Acute-Pain-Management-Changes-and-Challenges

The Opioid Epidemic: A New National Academies Interactive Guide

Few communities have been left untouched by the opioid epidemic, and based on current trends, premature deaths are likely to keep increasing. Stemming the harms to society will take years of sustained, coordinated efforts by our nation’s political and public health leadership and a broad range of stakeholders.


The guide outlines trends in the intertwined prescription and illicit opioid epidemics, links to additional resources, and provides the report’s recommendations for action by federal and state agencies, research sponsors, health professional organizations, and more. Please click here to launch the new interactive guide to the report.
A Novel Approach to the Pediatric Chronic Pain Fellowship: Rethinking How We Fashion Tomorrow’s Pediatric Pain Specialists

Mark Corridore  
Nationwide  
Children’s Hospital  
The Ohio State University  
College of Medicine

We currently have a problem in pediatrics; finding qualified, properly trained, and caring physicians who specialize in the treatment of chronic pain in children. While the demand for pediatric chronic pain specialists continues to rise, and clinic waiting times continue to grow, we are not seeing a corresponding increase in interest from new physicians. While it is true that adult chronic pain fellowships continue to be highly competitive, the same cannot be said in pediatrics.

According to the Association of Pain Program Directors (https://www.appdhq.org/fellowship-match), in the 2015-16 academic year, there were 84 ACGME accredited pain training programs participating in the National Resident Matching Program (NRMP). There were 286 positions offered which left 27% of all applicants unmatched. The vast majority of these ACGME programs are adult training programs. According to the Society for Pediatric Anesthesia website (last updated 2015) there were seven programs with dedicated pediatric training programs for a total of 10-11 positions [Boston Children’s (2-3), Cincinnati Children’s (2), Children’s National (1), Children’s Hospital of Wisconsin (1), Stanford (1), University of Colorado (1), Seattle Children’s (2)]. These programs are ACGME certified and allow the fellow to sit for the American Board of Anesthesiology pain boards upon completion.

There may be multiple reasons why residents are not “interested” in pediatric chronic pain. The first possible explanation is lack of exposure. It is a unique residency program that offers residents the opportunity to venture into a pediatric chronic pain clinic. Most residency training focuses on meeting the ACGME requirements for chronic pain, which are easily met in most academic adult chronic pain clinics. So, the likelihood of a resident rotating thru a pediatric pain clinic is rare. Secondly, many residents who pursue a pediatric anesthesiology fellowship have rejected the clinic of a chronic pain physician, just as many residents who enter a chronic pain fellowship have rejected the idea of a primarily OR based practice.

Even still, many pediatric anesthesiology fellowships focus on acute pain exposure leaving pediatric chronic pain experiences for those who already have an interest.

There are outliers of course. There do exist those individuals who want a career that bridges the gap between the OR and clinic. These special individuals have realized that to become a pediatric chronic pain physician, they need to apply for an ACGME pediatric anesthesiology fellowship during their CA2 year, then during their CA3 year apply for one of the 11 positions in an ACGME chronic pediatric pain fellowship. But what of those individuals who realize their interest in pediatric chronic pain during pediatric anesthesiology fellowship? What are the barriers to continue training in pediatric chronic pain?

In many instances, a young physician’s first meaningful exposure to pediatric chronic pain may not occur until their pediatric fellowship. At that point, under the current system, the fellow will apply for a chronic pain fellowship that won’t begin until a year after they have completed their pediatric training. For many, spending a year in “limbo” is hard to reconcile. Who will employ them? Will they want to return to training after a year as an attending earning a considerably higher salary? Another potential negative is the idea of spending 6 months of training in an adult setting when their focus is on pediatrics. And yet, this training in adult chronic pain is mandated for board eligibility in pain medicine.

These were some of the issues driving the creation of our pediatric comprehensive pain fellowship at Nationwide Children’s. Our goal is to train an individual who will work in a tertiary academic setting and become a contributing member of an academic anesthesiology department. In designing the fellowship, we wanted to create a pediatric anesthesiologist who would be a contributing member to the department in not only the clinic but the OR as well. Therefore, we developed a novel hybrid pediatric pain fellowship that combined part of our acute pain/regional anesthesiology fellowship with other aspects of pediatric chronic pain. This served multiple purposes. For one, the comprehensive pediatric pain physician should be comfortable instituting and running an acute pain service. Secondly, they should be an expert in regional anesthetic techniques. The training in regional techniques provides the necessary expertise and experience for the development of the manual dexterity needed for advanced pain procedures.

In the adult chronic pain setting, much of the focus is on procedures. This makes sense, since that is a driving force of the adult practice. In the pediatric setting, interventions take a back seat to the medical and psychological management that dominates a pediatric practice. There are fewer indications for many of the procedures that dominate the adult practice in the pediatric setting. Complicating things further, most young children will not cooperate with invasive procedures without significantly more sedation or general anesthesia than is commonplace in the adult practice.

We do not mean to imply that the adult procedures are useless in the pediatric setting. Quite the opposite; however, we designed a fellowship that will partner with pediatric interventional radiologists to provide advanced pain procedures, such as celiac plexus blockade. These advanced blocks are performed less frequently in a pediatric center such that a pediatric chronic pain physician may only perform one or two per year. Therefore, it may be safer and more efficient to have a pediatric interventional radiologist perform the procedure under the guidance of a pediatric chronic pain physician. This also avoids any turf wars over equipment, space, and technicians. We believe that it is better to collaborate, maximize everyone’s strengths and deliver optimum care to our patients. Therefore, our fellowship entails two months in the adult clinics where the fellow can gain exposure and understanding of what is possible in the adult population. The fellow will then be tasked with applying those concepts to a pediatric practice. Fellowship cannot teach everything that an attending physician will need, but it can prime them to continue learning and innovating after fellowship is completed.

The fellowship is one year of clinical training. Current ACGME chronic pain fellowships consist of 6 months in a pediatric setting and 6 months in an adult training center. Our fellows spend 10 months in pediatric centers and 2 months in an adult chronic pain clinic. The pediatric time is separated into 4 months of chronic pain clinic, almost 3 months of regional anesthesia and acute pain, and 1 month in pediatric palliative care medicine, all

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within the Department of Anesthesiology & Pain Medicine. Recognizing that the treatment of pediatric pain is not isolated to the chronic pain clinic, we reached out to the other sub-specialties that treat pain. We have formed collaborations with gastroenterology, neurology, rheumatology, psychiatry, neuroradiology, and integrative medicine (hypnosis, acupuncture, guided imagery). These sub-specialists were more than happy to contribute to building a curriculum and clinical experience. Their input has been invaluable, and the fellow spends half a month in these sub-specialties.

A final component of the training will be academic pursuits. Each fellow will participate in a quality improvement project and clinical research. Our department is well suited for success in both with resources for QI and research. The institution also provides an excellent lecture series covering skills for academic success, and we would expect the fellow to present their work at a national meeting. This is an important aspect of the training as we expect these fellows to enter into academic centers and continue to advance the field of pediatric pain management.

In conclusion, we have designed a unique fellowship that will prepare a physician to comprehensively manage pediatric pain, be it on the acute care service, providing regional anesthetics, or managing chronic pain. By recruiting fellows in pediatric anesthesiology training we will have individuals who desire a career in the operating room as well. The ultimate goal is to train an individual who is a caring physician, a fully engaged member of an academic anesthesiology department, and a champion for the treatment of pediatric pain. We feel confident that this program provides the framework for that success. As board certification is often viewed as needed to achieve such success and build such programs, we have partnered with The American Board of Pain Medicine, which has agreed to allow our fellows to sit for their board certification in Pain Medicine.

SEEN IN PEDIATRICS

Cancer Risk After Pediatric Solid Organ Transplantation (April 2017) http://pediatrics.aappublications.org/content/early/2017/04/24/peds.2016-3893

An Innovative Collaborative Model of Care for Undiagnosed Complex Medical Conditions (May 2017) http://pediatrics.aappublications.org/content/139/5/e20163373

Pain Assessment and Treatment in Children With Significant Impairment of the Central Nervous System (June 2017) http://pediatrics.aappublications.org/content/early/2017/05/18/peds.2017-1002

Outcomes of Nonoperative Management of Uncomplicated Appendicitis (June 2017) http://pediatrics.aappublications.org/content/early/2017/05/31/peds.2017-0048

Upper Respiratory Infections and Airway Adverse Events in Pediatric Procedural Sedation (June 2017) http://pediatrics.aappublications.org/content/140/1/e20170009

Palliative Sedation With Propofol for an Adolescent With a DNR Order (July 2017) http://pediatrics.aappublications.org/content/early/2017/07/04/peds.2017-0487


Hey, Doctor, Leave the PDA Alone (July 2017) http://pediatrics.aappublications.org/content/early/2017/07/10/peds.2017-0566

Spontaneous Closure of Patent Ductus Arteriosus in Infants ≤1500 g (July 2017) http://pediatrics.aappublications.org/content/early/2017/07/10/peds.2016-4258


Congenital Diaphragmatic Hernia and Growth to 12 Years (July 2017) http://pediatrics.aappublications.org/content/early/2017/07/12/peds.2016-3659

Variation in Preoperative Testing and Anti-reflux Surgery in Infants (July 2017) http://pediatrics.aappublications.org/content/early/2017/07/26/peds.2017-0536.info

Methodological and Ethical Issues in Pediatric Medication Safety Research (August 2017) http://pediatrics.aappublications.org/content/early/2017/08/02/peds.2017-0195


Guidance on Forgoing Life-Sustaining Medical Treatment (August 2017) http://pediatrics.aappublications.org/content/early/2017/08/24/peds.2017-1905


Synthetic Cannabinoid Use Among High School Seniors (September 2017) http://pediatrics.aappublications.org/content/early/2017/09/07/peds.2017-1330

Perioperative Spending on Spinal Fusion for Scoliosis for Children With Medical Complexity (September 2017) http://pediatrics.aappublications.org/content/early/2017/09/09/peds.2017-1233

US Emergency Department Trends in Imaging for Pediatric Nontraumatic Abdominal Pain (September 2017) http://pediatrics.aappublications.org/content/early/2017/09/13/peds.2017-0615

See in Hospital Pediatrics

Investigating Parent Needs, Participation, and Psychological Distress in the Children’s Hospital http://hosppeds.aappublications.org/content/early/2017/05/30/hpeds.2016-0175
The careers of Dr. Robert Smith and Dr. Robert Friesen have many similarities. Both of them started out as surgeons but ended up as anesthesiologists, with an interest in developing safe, clinical anesthesia care for children. They both pursued similar clinical interests in pediatric cardiac anesthesia and research in monitoring modalities. Like Dr. Smith was, Dr. Friesen is a well-mannered, soft spoken gentleman whose presence in the operating room always has a calming influence even in the most trying circumstances. These two gentlemen with their quiet demeanor and great clinical competence inspired those around them to do their best.

Dr. Robert Friesen retired from clinical practice this year with a long, distinguished career as an academic pediatric anesthesiologist at the University of Colorado and Children’s Hospital of Colorado, which is documented in a recent issue of the journal, *Pediatric Anesthesia.*

(1) Dr. Friesen earned his undergraduate degree at Duke University and attended medical school at the University of Kansas. After graduating from medical school, Dr. Friesen started his surgical internship at the University of Colorado. Fortunately, one of his early rotations was in anesthesiology, as he quickly realized he was much more interested in the practice of anesthesia rather than surgery. After meeting with the Chairman of the Department of Anesthesiology, Dr. Peter Cohen, he was able to change tracks and start an anesthesia residency. During his pediatric anesthesia rotation, Dr. Friesen worked with Dr. Charlie Lockhart, who fostered his interest in academic pediatric anesthesiology with an interest in cardiac anesthesia. Dr. Lockhart was the recipient of the Robert M. Smith Award in 2015. To gain further experience in the field of pediatric cardiac anesthesia, Dr. Friesen organized a year of training abroad, in the United Kingdom at St. Thomas’ Hospital and Great Ormond Street Hospital. This resulted in his first peer reviewed publication with Dr. A. Clements on measuring individual responses to heparinization for cardiopulmonary bypass with the early use of activated clotting time(2). This year was also the start of a lifelong friendship with Dr. Ted Sumner, who later became the Editor-in-Chief of the journal *Pediatric Anesthesia,* and who would then invite Dr. Friesen to join the editorial board, which Dr. Friesen now chairs. After his year of training in London, Dr. Friesen returned to Colorado in 1976 to begin his career at the Children’s Hospital of Colorado. He was the fifth pediatric anesthesiologist in the department. These were the formative years of the specialty of pediatric anesthesia, and Dr. Friesen’s research interests reflect the important clinical issues of the time.

In the 1970s and early 1980s, Halothane was the only choice for the inhaled induction of anesthesia in infants and children. Animal research demonstrated that the cardiovascular depression associated with halothane was more severe in newborn animals than older ones, presumably because the immature myocardium was more sensitive to depression(3-5). Rackow and Salanitre showed the increased incidence of cardiac arrest in infants undergoing general anesthesia, contributing to the mounting evidence that the cardiovascular depression by halothane was more severe in human infants(6). In a prospective study, Dr. Friesen demonstrated for the first time that at equipotent doses of halothane, blood pressure depression was greater in neonates and infants less than 6 months of age than in older children(7). Additional prospective studies of halothane induction of anesthesia in infants documented a mean decrease in blood pressure of 50% that could be attenuated by pretreatment with atropine to maintain heart rate (8). A similar study of isoflurane followed, in which similar hemodynamic changes were observed, and a high incidence of airway irritability and laryngospasm that precluded isoflurane from being a suitable inhalation induction agent (9). In further studies, Dr. Friesen demonstrated that the hypotension associated with halothane use in infants could be attenuated with pretreatment using oral atropine and was exacerbated by prolonged preoperative fasting (10, 11).

Much of this early research work was made possible with the introduction of improved monitoring. When Dr. Friesen started out, the only vital signs commonly monitored by pediatric anesthesiologists were temperature, ECG and heart tones using the precordial stethoscope, all of which had been introduced into clinical practice.

(Continued on page 12)
practice by Dr. Robert Smith. Experienced practitioners could listen to changes in heart tones during the induction of anesthesia with halothane, and titrate the amount of halothane to avoid cardiac arrest. Measuring blood pressure at that time was done manually, with a blood pressure cuff and stethoscope, listening for the changes in Korotkoff sounds. While this worked in older children it was very difficult to do in infants. Instead a Doppler probe was used, typically over the brachial or radial arteries, to listen for blood pressure changes during cuff inflation. In the late 1970s, Dr. Maynard Ramsey introduced the ‘Dinamap’, an acronym for 'Device for Indirect Non-invasive Mean Arterial Pressure', the first automated system to non-invasively measure blood pressure using an oscillometric method (12). Quick to realize the importance of this monitor in pediatric anesthesia, Dr. Friesen, working with one of his trainees, Lance Lichtor, conducted perhaps the first non-industry sponsored study of the Dinamap, demonstrating that its measurements were accurate in neonates and infants (13).

As with the Dinamap, another new monitor came along and captured Dr. Friesen’s attention. This was the Ladd Steritek Intracranial Pressure Monitor, a non-invasive monitor of intracranial pressure for neonates with open fontanels. The halothane anesthetic techniques at the time often resulted in large changes in blood pressure and intraventricular hemorrhage. Working with Rita Thieme, a neonatal nurse practitioner, Dr. Friesen conducted a series of studies on the changes in anterior fontanelle pressure with different anesthetic agents, during cardiopulmonary bypass and hypothermic circulatory arrest, but perhaps the most important of these studies demonstrated a 200% increase in intracranial pressure during awake tracheal intubation of preterm neonates (14-17). This latter finding has changed the way neonates are intubated in the operating room, with them under anesthesia, but has been slower to catch on in many neonatal intensive care units.

Many of these research studies on halothane and ‘new’ monitoring technologies in neonates took place in the cardiac operating room. Dr. Friesen continued to research pertinent clinical questions in the field of congenital cardiac anesthesia. Due to the problems associated with halothane anesthesia, synthetic opioids were widely used as they had minimal hemodynamic effects, even at high doses (18). Dr. Friesen worked with his anesthesia colleague, Desmond Henry, to confirm the lack of significant cardiovascular side effects in studies using fentanyl as the sole anesthetic agent in neonates (19). Further work with an anesthesia trainee, Jim Glenski, demonstrated the safety of high doses of fentanyl and sufentanil as anesthetics for pediatric cardiac anesthesia, and work with another trainee, Raphael Campanini, studied the use of remifentanil for fast track cardiac anesthesia (20, 21). One of the problems faced in the cardiac operating room is the coagulopathy associated with cardiopulmonary bypass. Before the advent of ‘miniaturized’ heparin coated bypass circuits, neonates were placed on cardiopulmonary bypass using large volume cardiopulmonary bypass circuits resulting in a dilutional coagulopathy. Dr. Friesen studied techniques to reduce this and demonstrated that both modified ultrafiltration and the infusion of fresh autologous whole blood led to significantly improved coagulation status following cardiopulmonary bypass (22, 23). A monitor which entered clinical practice much later in Dr. Friesen’s career was Near Infrared Spectroscopy (NIRS). While it was initially employed to monitor cerebral saturations in patients undergoing cardiopulmonary bypass surgery, Dr. Friesen recognized its use to monitor the gut in neonates with complex congenital heart disease who have an increased morbidity from gut ischemia. Working with a critical care trainee, Jon Kaufman, they determined that monitoring splanchnic regional oxygen saturation with a NIRS sensor placed over the anterior abdomen was an accurate monitor of gut perfusion and oxygenation and was superior to a sensor placed in the dorsolateral position for that purpose (24).

Dr. Friesen has always focused on the delivery of excellent clinical care to pediatric patients as a central theme to his research. When new monitoring technologies were introduced, usually for the adult population, he wanted to see how the new technologies could be applied to children and what new things pediatric anesthesiologists could learn. When the bispectral index monitor of hypnotic depth was introduced (BIS™ Medtronic, Minneapolis, MN), he validated its use as a sedation monitor by finding good correlation with validated sedation scores and then demonstrated that procedural sedation by non-anesthesiologists often attained the depth of general anesthesia (25-27).

The young Dr. Robert Friesen at ‘Denver Children’s Hospital’ circa 1980. Note that all monitors were individual components secured to the anesthesia machine and the precordial stethoscope on Dr. Friesen’s scrub top.
Pedicractic anesthesia began to emerge as a subspecialty in the 1960s. Herbert Rackow and Ernest Salanitre, both academic anesthesiologists at Columbia University, made significant contributions to developing the specialty. They were charter members of the Section on Anesthesiology and Pain Medicine of the American Academy of Pediatrics (AAP), founded in 1965, with Rackow being the section’s first chair. At the annual meeting of the Section in April 1990, Dr. Friesen, as the program chair, having earlier nominated these two pioneers in pediatric anesthesia for the Robert M. Smith award, had the honor of presenting it to both (34). In 2015, in Aberdeen, Scotland at the Annual Meeting of the Association of Paediatric Anaesthetists of Great Britain and Ireland (APA), Dr. Friesen was recognized for his outstanding contributions to the field of pediatric anesthesia with Honorary Membership of the APA.

As Dr. Robert H. Friesen retires from clinical practice in 2017, but continues his academic interests as Professor Emeritus, he achieves the highest recognition that can be given to a pediatric anesthesiologist in the United States, the Robert M. Smith award. The Section on Anesthesiology and Pain Medicine of the AAP represents a community of pediatric anesthesiologists who all feel this award is well deserved. Congratulations!

References


Study Finds Common Surgeries May Serve as Pathway to Nonmedical Opioid Use in Adolescents

Research presented at the American Academy of Pediatrics 2017 National Conference & Exhibition in Chicago shows teens commonly fill post-surgical painkiller prescriptions for months beyond typical recovery time.

CHICAGO – Research presented at the American Academy of Pediatrics 2017 National Conference and Exhibition shows that post-surgical opioid pain medications prescribed after common surgeries may become a pathway to continued, nonmedical opioid use by teens and young adults.

The study abstract, “Persistent Opioid Usage among Pediatric Patients Following Surgery in the United States,” was presented on Sunday, Sept. 17, at the Marriott Marquis Chicago.

Researchers examined data including nearly 90,000 privately insured U.S. patients between ages 13 and 21 (averaging age 17) with no previous opioid prescriptions who underwent one of 13 common surgeries for this age group, compared with a control sample. They looked for persistent opioid use, defined as continued prescription refills 90 to 180 days after the surgical procedure and beyond what is expected after routine surgery.

They found the incidence of new persistent opioid use following surgery was 4.8 percent, ranging from 2.7 percent to 15.2 percent across procedures, as compared to 0.1 percent in the nonoperative control group.

Gallbladder removal and colon surgery were among procedures associated with highest risk of new persistent opioid use, said lead abstract author Calista Harbaugh, M.D., a general surgery resident at the University of Michigan Medical School and pediatric surgery researcher at C.S. Mott Children’s Hospital in the Michigan Opioid Engagement Network. In addition, they found older youth with additional chronic conditions, depression, anxiety or prior substance use disorders were at higher risk.

“Opioids are commonly prescribed for pain after surgery, and until recently it was generally believed they were not addictive,” Harbaugh said. Recent research has shown that many adults are chronically using opioids after surgery, she said, but this is the first to show that long-term opioid use may also be a significant problem for adolescents and young adults who have surgery.

“The study is an important step toward recognizing that the opioid epidemic is affecting adolescents and young adults in a major way,” Harbaugh said, noting that when a refill is provided, the opioid pills may have been used, or they may have been saved or given to someone else in the community.

“Most adolescents who misuse prescription opioids get the pills from leftover prescriptions of their family, friends, or their own,” she said. “We need to make sure that we treat pain after surgery, but it must be balanced with the risk of providing more opioid than necessary to patients and their communities.”

Study Suggests Increase in Adverse Effects Due to Use of Opioids in Hospitalized Children


CHICAGO – The number of hospitalized infants, children and teens who experienced adverse reactions to opioid painkillers increased by more than half between 2003 and 2012, according to research presented during the American Academy of Pediatrics 2017 National Conference.

The study abstract, “Adverse Effects from Opioid Use in Hospitalized Children in the United States: a 9-year trend from 2003 to 2012,” was presented on Friday, Sept. 15. Researchers examined 2003, 2006, 2009 and 2012 data from the Agency for Healthcare Research and Quality’s Healthcare Cost and Utilization Project Kids’ Inpatient Database (KID) to analyze hospital stays of children aged 1 month to 17 years.

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Once Around The Block
By Bukola Ojo, MD & Corrie T.M. Anderson, MD
Seattle Children’s Hospital

Overview: The Quadratus Lumborum (QL) block is one of several interfascial peripheral nerve block techniques that have rapidly gained in popularity in both the pediatric and adult populations. The QL block provides similar spinal nerve coverage as the paravertebral block, the TAP block, and in some cases, the lumbar plexus block. The QL block may provide similar analgesia while avoiding the complications of some of these blocks such as pleural puncture in the paravertebral block or epidural/intrathecal spread in the lumbar plexus block. Although there are limited papers thus far detailing the efficacy of the QL block, a small randomized controlled trial as well as several case series and case reports suggest that children had effective perioperative analgesia from this block.

As a peripheral nerve block whose goal it is to anesthetize the anterolateral and anterior abdominal wall, the approaches to the QL block are more complex than those to the transversus abdominis plane (TAP) block, but it is a technique that rewards study. The QL block may be more effective than the TAP block, although this remains to be definitively proven. This may be because the spinal nerves innervating the abdominal wall are anesthetized at a more proximal point, and because this approach allows for easy spread of local anesthetic through the thoracolumbar fascia enveloping many of the nearby structures. In addition, with the QL block local anesthetic can spread into the anterior paravertebral space, providing some blockade of the sympathetic ganglion in that area.

Indications: A QL block is useful in surgical procedures that one would otherwise use a TAP block for analgesia such as those involving the abdominal wall: ostomy creation or closure, exploratory laparotomy, appendectomy, hernia repair, hydrocele repair and iliac crest bone graft donation. In addition, there have been reports of effective analgesia for nephrectomies and lower limb surgeries such as hip arthroplasties, and lumbar vertebral surgery.

Anatomy: The QL muscle represents the posterolateral border of the abdominal cavity. It is invaginated in the middle portion of the tripartite thoracolumbar fascia (TLF), psoas muscle invaginated in the anteriorly and the complex of spinalis muscles in the posterior envelope of the TLF. Originating from the iliolumbar ligament and the posterior iliac crest, the QL muscle inserts on the 12th rib and on the lateral aspects of the L1-L4 transverse processes. The QL muscle is bordered anteriorly and medially by the psoas muscle, and posteriorly and laterally by the latisissimus dorsi muscle and the spinalis complex including the erector spinae muscles. Fascia surrounding the QL muscle spreads laterally to invest the three flat abdominal muscles: the external and internal oblique muscles and the transversus abdominis muscles. Besides flexing the spine laterally and extending the vertebral column when there is bilateral contraction of the QL muscles, the QL muscle lowers the ribs during forced respiration.

Innervation of the abdominal wall is more complex than is usually presented in basic anatomy textbooks. There is significant branching and plexus formation that is not usually detailed in the textbooks. Thus it is not surprising that there is some controversy as to the proper placement (intramuscular, anterior, lateral/oblique, or posterior to the QL muscle) of local anesthetic for maximal benefit. Recent cadaveric studies suggest that the approach employed may indeed impact the spread of local anesthetic. For instance, the anterior approach showed more cephalad spread, covering the T9-12 and L1 distribution, whereas the posterior approach showed spread in the T11- L1 distribution with variable T10 staining. MRI studies have also shown the posterior approach to have wider coverage than the lateral approach. The spinal nerves T12-L4 that innervate the QL muscles are mixed sensory and motor nerves. The more proximal portions of these spinal nerves supplying the abdominal wall muscles have less associated branching than the distal portions of the nerves - a concept often lost on even the most practiced regionalist. Therefore, a less patchy block is likely to result from a QL block than a TAP block since the nerves block for the QL are being anesthetized in a more proximal location. Formed from the anterior and the posterior root nerve fibers, the spinal nerves divide into the anterior and posterior primary rami. The anterior rami of T12 through L4 are most important to the QL block as they are the nerves that pass in front of this muscle on their way to the TAP, the rectus muscle and ultimately to their cutaneous endpoints. These are the nerves targeted for blockade.

Equipment: A Tuohy needle (18 G X 5.1 cm or 8.3 cm Pajunk needle) with a 20 G catheter or a stimulating 22-21 G that is 5 cm or 10 cm depending on patient size; high frequency ultrasound probe and an ultrasound machine, sterile set up including gown, gloves, probe cover, and prep tray. The latter pieces of equipment are used if a catheter is to be placed. A reservoir (pump) with local anesthetic and a catheter can be used to provide a continuous infusion. The reservoir size depends upon the patient’s weight and the desired infusion duration. This time frame is usually 72 hours in our practice.

Block: To perform this block, place the patient in a semi-lateral decubitus position with the surgical side up. To open the space between the iliac crest and the rib cage, a bolster can be placed under the patient as a kidney rest. With the patient facing towards the proceduralist, such that the operator reaches over the patient, a pre-scan of the site to be blocked is performed looking for vascular structures in the needle path, anatomical abnormalities, or structural impediments. Adjust the table height to a comfortable level that prevents straining and fatigue. The ultrasound display is at the patient's back with this method to provide a more ergonomic approach to the block. After the pre-scan, drug dose calculation and pre-block checklist performance, an aseptic preparation of the needle entry site is undertaken. Place a high frequency ultrasound probe on the patient’s flank. The peritoneum and its contents should be visualized. Count the number of layers from the internal abdominal contents up towards the skin to determine the location of the fascial plane between the transversus abdominis muscle and the internal oblique muscle. Counting from the skin down can be hazardous in some patients due to their thick adipose tissue which can cause confusion in counting muscle layers. After identifying the three abdominal wall muscle layers, follow them posteriorly until the transversus abdominis muscle begins to be replaced by its fascia extension that covers the QL muscle. Local anesthetic can be placed at the anterolateral edge of the QL muscle (QLB1), the posterior surface of the QL muscle between it and the latisissimus dorsi muscle (QLB2) or on the anterior surface of the QL muscle just posterior to the psoas muscle that lies in front of the QL muscle (QLB3). Direct intramuscular injection of the QL muscle has also been suggested. After aspiration, inject a test dose, watch for EKG changes and then aspirate the syringe again to detect blood. Continue to intermittently aspirate as a fractionated injection of local anesthetic is made. Do this until the full dose of local anesthetic has been administered.
Local Anesthetic Dose (bolus): Typically Ropivacaine 0.2-0.5% or Bupivacaine 0.25-0.5% are used in our practice. Since this is a fascial plane block and not a specific nerve block, larger volumes of local anesthetic are required. Injection of 0.3-0.5 ml/kg (to a maximum of 30 ml) is needed. Calculate the toxic dose for each patient, remembering to include any local anesthetic that your surgical colleagues may be administering. Adjuvants such as clonidine and intravenous dexamethasone can also be considered in the bolus dose.

Drugs in Pump: Ropivacaine 0.2% plain or Bupivacaine 0.25% plain

Catheter: For a longer lasting block, a catheter can be inserted after dilating the space for the catheter. To maintain optimal sterility for the patient, perform a surgical scrub, gown and then glove when inserting a catheter. Pass the catheter through the block needle until the tip lies beyond the needle. Proper catheter placement can be verified by ultrasound. Remove the block needle and adjust the catheter position under with ultrasound guidance. Apply a skin adhesive as needed to the catheter exit site. Secure the catheter with an occlusive dressing.

Perioperative Medications: When appropriate, administer a preoperative sedative, like oral Midazolam. To prevent trauma to them, children are usually anesthetized for blocks. Post-op diazepam for spasms along with around the clock acetaminophen and a rescue pain medication may be prudent.

Complications: Specific: Femoral nerve block from the spread of local anesthetic because of the contiguous relations the thoracolumbar fascia has with the iliopectoas fascia. Lumbar plexus block can occur if the local anesthetic spreads into the psoas muscle. Renal damage and intraperitoneal or bowel puncture are possible along with paravertebral and epidural spread of the local anesthetic. General: Failed block, neuropathy, vascular puncture, ischemia, nerve injury, hematoma, diaphragmatic dysfunction, patchy or incomplete block, spinal (rare) and local anesthetic toxicity.

Caution: Make sure neither the needle nor the catheter is intravascular by using an epinephrine containing test dose and intermittently aspirating before each incremental injection of the local anesthetic. Inadvertent intravascular delivery may result in local anesthetic systemic toxicity (LAST). Fractionate the dose injected and never inject the whole local anesthetic dose at one time. Refer to the drug manufacturer’s package insert for further instructions and information. The proceduralist is responsible for prescribing drugs used during the procedure based on each patient’s clinical status (e.g., age, body weight, disease state of patient, concomitant medication(s)). A patient may experience loss of motor control or feeling at or around the anesthetized area. The proceduralist should instruct patient/parent on appropriate measures to avoid injury. Since a patient’s posture and respiration can be impacted with this block, care is needed to insure the patient is not at risk from concomitant ailments that may lead to respiratory embarrassment or postural instability. Medications used should be administered in accordance with instructions provided by the drug manufacturers and your institution’s pharmacy practices. Monitors for the patient should include; pulse oximetry, ETCO₂, ECG and NIBP. Intravenous access is imperative. Suction and resuscitation material including Intralipid®, should be readily available. Ensure that all blocks are performed with someone other than the proceduralist monitoring the patient. Remember, the local anesthetic infusion rate for newborns should be reduced by 50%. Infants and children should not have infusion rates greater than 0.4mg/kg/hr of ropivacaine or bupivacaine if either of these drugs are used for infusion purposes. Make sure to follow the American Society for Regional Anesthesia (ASRA) recommendations in patients who are or will be anticoagulated.
First, Do No Harm: Marshaling Clinician Leadership to Counter the Opioid Epidemic

At the request of the National Governors Association, the National Academy of Medicine convened a group of experts and field leaders to explore clinician’s roles in addressing opioid misuse and addiction. The resulting special publication is informed by, and builds on, initiatives and guidelines that have been stewarded by various stakeholder organizations providing leadership in addressing these issues. In the midst of evolving understanding of and experience in pain management and substance abuse, the authors offer to clinicians a set of axioms applicable both to responsible, appropriate opioid prescribing practices, and to recognition and treatment of substance use disorder. Also underscored are actions that clinicians can take to improve their skills and effectiveness in the face of the growing need, including leadership engagement to ensure that communities have the resources and tools that clinicians require to fulfill their responsibilities.
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Centers for Disease Control and Prevention
Your Online Source for Credible Health Information

Rx Awareness: Sharing real stories about the devastation of opioid use disorder and overdose

Overdoses from opioids are on the rise and killing Americans of all races and ages. From 1999 to 2015, more than 183,000 people died in the U.S. from overdoses related to prescription opioids. Families and communities across the country are coping with the health, emotional, and economic effects of this epidemic. To address this public health crisis, the Centers for Disease Control and Prevention (CDC) launched the Rx Awareness communications campaign, its latest effort, in the fight against opioid overdose.

The Rx Awareness campaign tells the real stories of people whose lives were torn apart by opioid use and abuse. The campaign aims to increase awareness and knowledge among Americans about the risks of opioids and deter inappropriate use.

With the tagline, “It only takes a little to lose a lot,” the Rx Awareness campaign uses testimonials to educate the public, focusing on the dangers of prescription opioids whether used for medical or non-medical purposes.

The cornerstone of the campaign is a series of videos that feature individuals who are living in recovery from opioid use disorder, or who are family members who lost someone to a prescription opioid overdose. Other campaign materials include audio advertisements, social media advertisements, internet banners, web graphics, billboards, and posters all highlighting the importance of knowing the risks associated with prescription opioids in order to prevent overdoses.

Spread the Word
Everyone can help stop prescription opioid overdose. The success of the Rx Awareness campaign relies on individuals and on partnerships with state and local agencies and organizations across the country to share the messages and resources. We need your support to spread the word! You can share and promote the Rx Awareness campaign on your social media channels, including Facebook, Instagram, and Twitter. Download shareable images and the Rx Awareness Social Media Kit from the Social Media web page.

• Take part in our #RxAwareness Thunderclap: Support the Rx Awareness Thunderclap to Help Prevent Prescription Opioid Overdose. Join today and share on your social media channels to help us gain more support: https://www.thunderclap.it/projects/62514-raise-rxawareness
• Twitter: It only takes a little to lose a lot. Raise awareness about Rx opioids and prevent Rx opioid overdose. #RxAwareness cdc.gov/RxAwareness
• Facebook and Instagram: #RxAwareness starts with you. Tell others how prescription #opioids have affected you. Learn more at cdc.gov/RxAwareness.

Learn More About Rx Awareness
For more information about the campaign or for additional materials, visit the website www.cdc.gov/RxAwareness.

Medicine Safety for Children: We All Play a Role

All physicians can take part in educating families about the importance of safe storage and disposal of medications! Leaders from our AAP Section on Anesthesiology and Pain Medicine recently helped the AAP develop a poster on Medicine Safety for Children and Teens. The poster can be downloaded at: https://www.aap.org/en-us/Documents/cosup_poster.pdf. It is designed specifically so that local resources can be added to it. We ask physicians using this resource in their offices or as a handout to patients to consider using the available space at bottom for adding phone numbers or websites of local take back programs and resources in the area. Here are some websites that may help with looking for local resources:

www.fda.gov/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/ensuringsafeuseofmedicine/safedisposalofmedicines
www.deadiversion.usdoj.gov/drug_disposal/takeback
https://apps.deadiversion.usdoj.gov/pubdispsearch
www.deadiversion.usdoj.gov/drug_disposal

Please consider using/sharing this resource!!!

States Declare Opioid Disasters

The opioid crisis is responsible for 91 deaths daily across the country, a 400% increase since 1999. Many states have acted to limit opioid prescriptions or otherwise use state law to reduce opioid supply over the course of this year, and in late September, 37 state attorneys general cosigned a letter to the insurance industry urging their assistance in curbing overprescribing of opioids. In a dramatic step, the governors of 6 states have used their authority to declare disasters in response to the growing numbers of deaths attributed to opioid overdose, and several tribal governments across numerous states have taken similar actions as well.

Declared States of Emergency—Opioid Crisis, a new resource from the Network for Public Health Law, includes a fact sheet and primer on the issue, offering a comparative look at these actions and how state level policy and authority can be leveraged to combat the current opioid crisis and mitigate its effects on children, families, parents, and caregivers.
Intranasal Procedural Sedation for Diagnostic Procedures in Children

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Introduction
Over the past few years, the pediatric sedation literature is replete with articles describing various sedation regimens for children who require diagnostic radiologic procedures such as MRI or CT scan, or neuro-diagnostic testing such as electroencephalogram (EEG) or ABR (auditory brainstem reflex testing). This development is having a profound impact on the sedation management of children by providing a less invasive, less painful, and more satisfying medication administration process. The primary sedative agents administered nasally in children include dexmedetomidine (DEX), midazolam (MID), ketamine (KET), and fentanyl. Worldwide, this technique is utilized in the emergency department, the sedation unit, the radiology suite, and the critical care units. This administration technique has many advantages for the medical team, the patient and their family as outlined in Table 1.

| Table 1. Advantages of Intranasal (IN) Sedative Administration in Children |
|--------------------------------------------------|---------------------|
| Relatively non-invasive and painless             | No first pass metabolism |
| Better patient and family satisfaction           | High bioavailability |
| Reduced materials and equipment                  | Relative rapid onset of therapeutic effect |
| Reduced expense                                  | Potential for direct CNS delivery of agents |
| Reduced training requirement                     | Precludes the need for venous access |
| Increased safety with fewer adverse events       | Effective sedation regimens |

Nasal Administration
The nasal cavity is the administrative route for many pharmacologic agents with either local nasal effects or wider systemic effects. Examples of nasally-administered medications with systemic effects include agents for migraine treatment (sumatriptan), blood glucose control (insulin), smoking cessation, analgesia (fentanyl), illness prevention (influenza vaccination), opioid overdose (Naloxone), and hormonal replacement (desmopressin).1

The nasal cavity can be subdivided in 3 regions: the nasal vestibule, the respiratory region, and the olfactory region (Figure 1). In the adult male, the total surface area of the nasal cavity is approximately 150 cm² with the olfactory mucosa of the roof of the nasal cavity covering only 4 cm². The respiratory region begins with a squamous epithelium that gradually transitions to a pseudostratified columnar epithelium covered with microvilli, which has a relatively high absorptive capacity and is thus a potential site for systemic drug absorption. The junctional complexes of these epithelial cells have selective permeability to hydrophilic molecules.2

Intranasal medications can be administered in a variety of ways: the syringe drip method into the nares or with the use of an aerosolizing device such as the LMA MAD Nasal intranasal mucosal atomization device (Figure 2, Teleflex Incorporated, Research Triangle Park, NC).3 The maximal volume limit for...
Intranasal Procedural Sedation for Diagnostic Procedures...

Intranasal administration is not clear but up to a maximum of 0.5 mL of concentrated medication in each nare in the child, and up to 1 ml in the adult may be reasonable.

Fig. 1. Schematic representation of the lateral Wall of the human nasal cavity (from Illum, 2004)

The Nose-to-Brain Pathway
The olfactory mucosa is a pseudostratified respiratory epithelium with olfactory sensory neurons, which extends into the basement membrane and then through the cribiform plate to synapse in the olfactory bulb. The so-called nose-to-brain pathway for drugs may be by the axonal transport mechanism in an intracellular fashion, or by the olfactory epithelial pathway via the tight junctions. Thus, medications may reach the central nervous system either by transepithelial absorption into the blood stream with transport across the blood-brain barrier, or by the nose-to-brain pathway (Figure 3).¹

Fig. 2. LMA® MAD Nasal™ Intranasal Mucosal Atomization Device. (from www.teleflex.com)

Fig. 3. Schematic of nasal drug delivery. (from Costantino, 2007)

Fig. 4. Dexmedetomidine concentrations in plasma after IV-DEX (closed circle) and IN-DEX (open circles). (from Iirola, 2011)

Dexmedetomidine Usage in Children
Dexmedetomidine (DEX) is a highly selective alph-2 receptor agonist that was approved by the FDA in 1999 for short-term sedation in the ICU.
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With further patient experience, unlabeled usage for DEX has expanded to include its use as a pre-operative medication, as an anesthetic adjunct, and as a post-operative sedative. Its use in pediatrics began in the perioperative arena but now it is being used in the PICU and in the pediatric sedation suite as a safe and effective sedative agent.⁴,⁵

In one of the first reported pediatric series of the use of dexmedetomidine as a sedative agent, Nichols and colleagues of the University of Missouri reported their retrospective case series of intravenous dexmedetomidine (IV-DEX) as a rescue agent in the MRI suite following failed sedation with chloral hydrate or benzodiazepines.⁶ Many other prospective and retrospective case series then followed using dexmedetomidine by the intravenous and intranasal routes, and in combination with other agents.

Last year, the Pediatric Sedation Research Consortium (PSRC), which is a collaborative group of institutions dedicated to improving pediatric sedation and anesthesia care outside of the OR, published a study of 13,072 procedural sedation episodes in which DEX was utilized. Their study demonstrated a sedation success rate of 99.7% with an overall serious adverse event rate of 0.34% (45 of 13,072). Approximately 10% of these cases received IN-DEX, often co-administered with a benzodiazepine. It is currently the largest published series reported thus far and demonstrates the high success rate and safety of dexmedetomidine as a sedative agent.⁷

Intranasal Dexmedetomidine and Midazolam

IN-DEX usage in humans began with pioneering studies looking at its pharmacokinetics and pharmacodynamics in comparison with intravenous dexmedetomidine in healthy adult volunteers. With IN-DEX, peak plasma concentrations of dexmedetomidine are reached in 38 minutes with bioavailability of 82%. Onset of effects of IN-DEX was 30 to 45 minutes. The plots of dexmedetomidine plasma concentration over time are comparable between intravenous and intranasal administration (Figure 4).⁸

One of the earliest prospective pediatric studies of IN-DEX was published in 2012 in which the researchers administered 2 mcg/kg by syringe drip method 30 minutes prior to their scheduled study. They found that 60% (17 of 28) of their patients successfully completed their MRI scan without adverse events.⁹ Further studies, both prospective and retrospective case series, have refined dosing quantity, dosing technique, and the use of adjunctive sedative agents to improve the sedation success rates while still maintaining an excellent safety profile. Figure 5 offers selected case series for a variety of diagnostic procedures in intranasal sedative agents.

Summary

In summary, there are now many well-studied intranasal sedation regimens available to the clinician providing procedural sedation services to children. These regimens have good efficacy and a strong safety profile, if the pediatric sedation services are rendered within an environment that has the appropriate personnel, policies, support systems, supplies, equipment, and monitoring. There are still areas of intranasal sedation administration that require further research to include determining the maximal administration volume for a given child's age or size, the proper patient positioning, and the optimal medication administration device.
Table 2. Selected Pediatric Intranasal Sedation Studies – Therapeutic & Diagnostic Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Study Author &amp; Year</th>
<th>Study Design</th>
<th>Study Size</th>
<th>Sedative Regimen</th>
<th>Admin. Technique</th>
<th>Sedation Success (1st dose)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT Scan</td>
<td>Mekitarian Filho, 2013&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Prospective Observational</td>
<td>60</td>
<td>IN MID 0.4 mg/kg Rescue with IN MID 0.1 mg/kg</td>
<td>LMA MAD</td>
<td>1 dose: 75% 1-2 doses: 93.3%</td>
</tr>
<tr>
<td></td>
<td>Mekitarian Filho, 2015&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Prospective Observational</td>
<td>60 (ED patients)</td>
<td>IN DEX 2.5 mcg/kg Rescue with IN DEX 1 mcg/kg</td>
<td>LMA MAD</td>
<td>95%</td>
</tr>
<tr>
<td>MRI Scan</td>
<td>Ibrahim, 2014&lt;sup&gt;12&lt;/sup&gt;</td>
<td>Prospective RCT</td>
<td>58 (29 each group)</td>
<td>IN DEX 3 mcg/kg vs IN Ketamine 7 mg/kg Rescue as needed</td>
<td>Syringe drip</td>
<td>IN DEX: 86.3% IN KET: 79.4%</td>
</tr>
<tr>
<td></td>
<td>Tug, 2015&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Prospective RCT</td>
<td>60</td>
<td>IN DEX 3 vs 4 mcg/kg Rescue with IV Propofol</td>
<td>Syringe drip</td>
<td>3 mcg/kg: 30% 4 mcg/kg: 70%</td>
</tr>
<tr>
<td>ABR/EEG</td>
<td>Baier, 2016&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Retrospective</td>
<td>169 (EEG – 117, ABR – 52)</td>
<td>IN DEX 2.5-3 mcg/kg Rescue with IN DEX 1-1.5 mcg/kg</td>
<td>LMA MAD</td>
<td>1 dose: 90% 1-2 doses: 99%</td>
</tr>
<tr>
<td>ABR</td>
<td>Reynolds, 2016&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Prospective RCT</td>
<td>90</td>
<td>Oral chloral hydrate vs IN DEX 3 mcg/kg</td>
<td>LMA MAD</td>
<td>IN-DEX: 89%</td>
</tr>
<tr>
<td></td>
<td>Reynolds, 2016&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Retrospective</td>
<td>300 (100 IN DEX)</td>
<td>PO CH 50 mg/kg vs IN DEX 4 mcg/kg</td>
<td>LMA MAD</td>
<td>IN-DEX: 91%</td>
</tr>
<tr>
<td></td>
<td>Li, 2015&lt;sup&gt;17&lt;/sup&gt;</td>
<td>Prospective Observational</td>
<td>115</td>
<td>IN DEX 3 mcg/kg</td>
<td>LMA MAD</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>Li, 2016&lt;sup&gt;18&lt;/sup&gt;</td>
<td>Prospective RCT</td>
<td>279</td>
<td>IN DEX 3 mcg/kg by LMA MAD vs syringe drip method</td>
<td>Both LMA MAD</td>
<td>MADM: 82.5% Syringe drip: 84.5%</td>
</tr>
<tr>
<td>ECHO</td>
<td>Miller, 2016&lt;sup&gt;19&lt;/sup&gt;</td>
<td>Retrospective</td>
<td>63</td>
<td>IN DEX 2.5-3 mcg/kg Rescue with IN DEX 1 mcg/kg</td>
<td>LMA MAD</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Miller, 2016&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Prospective RCT</td>
<td>150</td>
<td>PO CH 70 mg/kg vs IN DEX 2-3 mcg/kg</td>
<td>Syringe drip</td>
<td>N-DEX: 98%</td>
</tr>
</tbody>
</table>

Fig.5. Chart of selected pediatric intranasal sedation studies for diagnostic procedures.
Legend: IN DEX, Intranasal dexmedetomidine; IN KET, Intranasal ketamine; IN MID, Intranasal midazolam; PO CH, Oral chloral hydrate; LMA MAD, LMA® MAD Nasal™ Mucosal Atomizer, Teleflex Inc., Research Park, NC, USA
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References:
FDA warning on anesthesia calls attention to malpractice risks associated with medications, failure to timely refer

by Gary N. McAbee D.O., J.D., FAAP; Steven M. Donn M.D., FAAP

Rita Agarwal, M.D., FAAP, chair of the AAP Section on Anesthesiology and Pain Medicine Executive Committee, and Constance S. Houck, M.D., FAAP, chair of the Surgical Advisory Panel, contributed to this article.

In December 2016, the Food and Drug Administration (FDA) issued a drug safety communication (https://www.fda.gov/Drugs/DrugSafety/ucm532356.htm) warning about the potential negative effects of anesthesia and sedatives on the neurodevelopmental and behavioral outcome in children under age 3 years.

The FDA notice indicated that animal studies, and some human studies, have demonstrated that general anesthesia and sedative drugs used for more than three hours, or repeated use of anesthetics, may be associated with resultant developmental/learning and behavioral disorders. The alert advised health professionals to "balance the benefits of appropriate anesthesia in young children and pregnant women against the potential risks, especially for procedures that may last longer than 3 hours or if multiple procedures are required in children under 3 years."

This will result in a labeling change for 11 commonly used anesthetic and sedating agents, including propofol, ketamine, phenobarbital and benzodiazepines. Currently, there is no black box warning.

This action precipitated controversy not only because of the underlying science upon which it was based but also because of concern that necessary procedures and surgery that younger children require may be delayed because of the FDA alert. Others cited more widespread concern for delays not only in surgery but for delays in procedures such as imaging studies that require anesthesia or sedation for less than three hours.

In response to these concerns, the FDA published a communication on April 27 (https://www.fda.gov/Drugs/DrugSafety/ucm554634.htm) stating that "surgeries or procedures in children younger than 3 years should not be delayed or avoided when medically necessary. Consideration should be given to delaying potentially elective surgery in young children where medically appropriate."

An editorial in the New England Journal of Medicine noted that the studies upon which the FDA relied had methodological flaws, including other confounding factors (such as the underlying medical condition for which the procedure is needed) that may have adversely impacted developmental and behavioral outcomes (Andropoulos DB, Green MF. N Engl J Med. 2017;376:905-907). The authors of the editorial cited more recent studies that refuted any adverse cognitive effect from anesthesia. The recent General Anesthesia vs. Spinal/Regional study and the Pediatric Anesthesia and Neurodevelopment Assessment study demonstrated that a single, brief exposure to general anesthesia was not associated with poor developmental outcome.

Such an alert might subject clinicians to an increased malpractice risk for failure to timely refer because of concern for adverse developmental outcome, or conversely, risk for adverse developmental or behavioral outcome secondary to the anesthesia/sedation that was given to a young child. This issue relates to two broader issues of pediatric malpractice risk: cases associated with the use of drugs and cases involving a failure to refer.

Problems with medication account for approximately 4%-10% of medical malpractice lawsuits against pediatricians. A 2008 pediatric study found that 11% of hospitalized children had problems secondary to medication and that 22% were avoidable (Otero P, et al. Pediatrics. 2008;122:e737-e743).

The Physician Insurers Association of America (PIAA), the largest independent malpractice claims database,
analyzed pediatric claims over a 10-year period. Although only one out of four closed medication claims resulted in a payout, the average indemnity was over $200,000. The top classes of pharmaceuticals relating to medication errors involved those used for heartburn, esophageal disorders, viral illness (likely due to inappropriate antibiotic prescribing), epilepsy, asthma and attention-deficit/hyperactivity disorder/hyperkinetic syndrome. When there was a major permanent injury or a grave outcome, the average indemnity paid was $322,000 and $466,000, respectively. Claims regarding asthma drugs resulted in the highest average indemnity payment.

Problems with a failure or delay in referral also can be a malpractice risk for pediatricians. From the PIAA database, 4% of the top 10 causes of malpractice cases against pediatricians involved this allegation. However, 41% of closed claims resulted in a payout for an average indemnity payment of nearly $330,000. When there was a significant permanent injury, major permanent injury or a grave outcome, the average indemnity payments were $292,000, $309,000 and $450,000, respectively (PIAA. A Risk Management Review of Malpractice Claims-Pediatrics. 2013).

Pediatricians should have an open and reasoned discussion with parents, surgeons and anesthesiologists about procedures (including imaging studies) that may require anesthesia or sedation. The discussion should include the potential risks and benefits of deferring the procedure until the child is older or proceeding right away.

Regional anesthesia may be an alternative for some procedures, although not for all. As of now, briefer periods of exposure to general anesthesia do not appear to be problematic. Further studies are in progress to help clarify these issues. Until then, thorough documentation of indications, risk/benefit analysis and informed consent is strongly advised.

Drs. McAbee and Donn are former members and chairs of the AAP Committee on Medical Liability and Risk Management.