



## Committee News

# Pediatric Pain Management: We've Come a Long Way, but We Have Much More to Do

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**C**omprehensive analgesia is an essential component of health care for individuals suffering from pain in the context of injury, illness, or in the perioperative setting. Poorly treated pain can have both immediate and long-lasting consequences, including, but not limited to: increased suffering, pain sensitivity, morbidity and disability, a transition to chronic pain with a propensity for opioid misuse and abuse, behavior and cognition changes, and diminished quality of life (*Pain Res Manag* 2014;19:198-204; *Hosp Pediatr* 2015;5:18-26). Pain management has come a long way in the past few decades. We have seen several paradigm

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## ANESTHESIOLOGY® 2021

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Chair of the International Association of Venue Managers Board of Directors, where he advances best practices among venue professionals.

SDCC takes advantage of Southern California's warm climate through its ample and inviting outdoor spaces, where groups can enjoy a physically distanced setting and sweeping views of the San Diego Bay. Whether participating in receptions on the center's waterfront terraces or enjoying post-event fare at spacious outdoor patios in the Gaslamp District, attendees will have options for comfortable networking and socializing.

"From our vibrant innovation economy to our rich and diverse cultural of-

ferings to our endless opportunities for outdoor recreation and relaxation, our destination is designed to inspire productivity and creativity that delivers a real return on investment for everyone," said Julie Coker, President and CEO of the San Diego Tourism Authority. "We look forward to welcoming ASA back to San Diego so attendees and exhibitors can connect and collaborate with colleagues – safely."

In addition to the safety measures San Diego has in place, ASA will introduce new scan-and-go badge pickup procedures, touchless ticketing for sessions, and socially distanced sessions and exhibits. ASA will follow local and federal safety and contact tracing protocols. Sign up for updates about ANESTHESIOLOGY 2021 at [asahq.org/ANES21](http://asahq.org/ANES21). ■

## Plan Your Trip

The San Diego Convention Center is located in downtown San Diego, a 10-minute drive from the San Diego International Airport. For additional information about the destination and up-to-date details about COVID-19 protocols, visit:

San Diego Convention Center: [Visitsandiego.com](http://Visitsandiego.com)  
San Diego Tourism Authority: [Sandiego.org](http://Sandiego.org)  
San Diego International Airport: [SAN.org](http://SAN.org)

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shifts; however, acute and chronic pain remain significant public health concerns, and pain management remains a challenge for health care professionals. Pain is often undertreated, a problem that becomes more apparent when discussing pediatric patients. Until the 1980s, surgical procedures in neonates were often performed with minimal anesthesia or analgesia, as infants and neonates were presumed to have immature pain circuitry and processing (The Neuromuscular Maturation of the Human Infant. 1969; *Front Pediatr* 2020;8:30). Pediatric patients exhibit significant differences in analgesic pharmacology and may have difficulty reporting pain compared to adults. Together with inadequate pain management curriculum in allied health care training programs, these factors contribute to health care providers' discomfort and difficulty in providing effective pain management for pediatric patients. In the past decade, pain management has been further complicated by an increased focus on the harmful impact opioids can have on patients and our communities. It has resulted in increased regulation surrounding opioid prescribing, which in some states has led to further discrepancies in acute pain management in children when compared with adults. These challenges, although daunting, have paved the way for progress and growth. Pediatricians, surgeons, anesthesiologists, pain specialists, and researchers have come together to tackle these issues, and as a result, we have seen increased attention, research, and clinical focus on pediatric pain.

Pediatric pain research lags behind adult research, but it has seen exponential growth and diversity in the past few decades. Seminal work by Taddio and Christen has shown that exposure to pain in the neonatal period and early childhood can have long-lasting implications for pain sensitivity, behavior, and neurocognitive development through childhood and later in life (*Clin Ther* 2009;31 Suppl 2:S152-67; *Pain* 2009;144:43-8; *Lancet* 1997;349:599-603). Simultaneously, Dr. Kanwaljeet Sunny Anand pioneered work on the endocrine-metabolic stress responses of infants undergoing surgery (*Anesthesiology* 2019;131:392-5). Research utilizing cerebral oximetry, EEG, and functional MRI has revealed that nociceptive pathways are formed in utero and that connections corresponding to higher pain processing and affective components of pain are established early in the neonatal period, providing objective data to refute the misbelief that infants do not experience pain (*Front Pediatr* 2020;8:268; *Lancet Digit*

*Health* 2020;2:e458-67). Maria Fitzgerald and colleagues have contributed to a greater understanding of the neurobiological mechanisms of infant and childhood pain (*Neuroscience* 2016;338:207-19; *Exp Physiol* 2015;100:1451-7). Researchers have studied the mechanisms underlying the transition from acute to chronic pain in children, helping us identify preoperative predictors and risk factors to prevent chronic pain development (*Can J Pain* 2020;4:3-12; *J Pain* 2017;18:605-14; *J Pain* 2020;21:1236-46; *J Pain Res* 2020;13:3071-80). Sadhasivam and Chidambaram have assembled a large body of work investigating the pharmacogenomics of opioids and the biopsychosocial determinants of acute and chronic postsurgical pain, including psychosocial, genomic, and epigenetic markers (*Curr Opin Anaesthesiol* 2017;30:349-56; *J Neuroradiol* 2020;S0150-9861-30278-9; *Pharmacogenomics* 2020;21:55-73; *Eur J Pain* 2017;21:1252-65). Opioid stewardship is also gaining popularity in research, with work by Groenewald and the Monitoring the Future Study shedding light on factors that predict future opioid misuse and abuse in children (*Evid Based Nurs* 2016;19:83; *Pediatrics* 2015;136:e1169-77).

**“It is our responsibility as health care professionals to be aware that pain remains undertreated in children. We must rise to the challenge of serving our pediatric patients who suffer from or may experience pain. We should strive for self-awareness of our biases and limitations when treating pediatric pain and ask for help when we need it.”**

In parallel to the evolution we have seen in basic and translational pediatric pain research, there have been robust changes in pediatric pain management clinical practices. Growth in pain research and clinical practice has dovetailed throughout the years, sparking synergistic advances in each arena. As mentioned earlier, the work of Drs. Taddio and Anand were pivotal in changing health care providers' belief systems regarding the experience of pain

in early life; anesthesia and analgesia became standard practice for pediatric surgery and other painful procedures in the NICU and beyond. Advances in our understanding of pediatric analgesic and anesthetic pharmacology aided health care practitioners in their ability to provide analgesia in a more safe and efficacious manner. Also, pediatric pain detection advances, such as age-appropriate pain assessment scales, helped analgesic delivery become more widespread in painful pediatric conditions. We have seen the continued incorporation of pediatric regional anesthetic techniques and guidelines into advanced clinical practices and educational programs (*Reg Anesth Pain Med* 2018;43:211-6; *Cochrane Database Syst Rev* 2016;2:CD011436). Pediatric acute and chronic pain medicine divisions have blossomed throughout the U.S. and internationally. Pediatric palliative care divisions and programs have also followed suit.

Pediatric analgesia has evolved from single-modality therapies to personalized, multimodal cocktails and enhanced recovery protocols (ERAS) that focus on comprehensive analgesia with opioid-sparing techniques. The importance of multidisciplinary care for chronic pain has become the gold standard in children, and its role in treating acute pain cannot be emphasized enough. Cognitive-behavioral therapy and optimization of pain coping techniques to minimize pain flares and patient/parent-catastrophizing with our psychology colleagues' help are as crucial as any pharmacologic therapy (*Cochrane Database Syst Rev* 2018;10:CD005179; *Cochrane Database Syst Rev* 2015;3:CD011118; *Cochrane Database Syst Rev* 2018;9:CD003968; *Pain Rep* 2019;5:e804). Assistance from physical and occupational therapy on function, reconditioning, safe movement patterns, and tackling of kinesiophobia is quintessential to recovery in acute pain and transformative in chronic pain conditions. Child-life specialists, art therapists, music therapists, pet therapists, and our nursing colleagues are the unsung heroes of pediatric pain medicine, and their role in pediatric pain management is undeniable.

Pediatric pain management has come far since the 1980s, but we still have a long way to go. To date, both acute and chronic pain remain untreated and undertreated in pediatric patients (*Pain Res Manag* 2014;19:198-204; *Hosp Pediatr* 2015;5:18-26). There is a shortage of pediatric pain specialists, and the waitlists for pediatric pain clinics can seem endless. Formal pediatric pain training programs are becoming more widespread but are still few and far between. Health care training programs still lack formal pediatric pain curricula, and health care

providers' discomfort in treating more complex pediatric pain is still pervasive. Disparities exist in pediatric pain management for minority populations, those with lower socioeconomic status, and patients with disabilities (*J Racial Ethn Health Disparities* 2018;5:73-7; *JAMA Pediatr* 2015;169:996-1002; *Scand J Pain* 2019;19:109-16). It is often challenging to get insurance approval for non-opioid analgesics and psychological and physical therapies crucial to chipping away at the biopsychosocial context of an individual's pain. The COVID-19 pandemic has further complicated things by interrupting essential pain research and making pediatric pain management services even more challenging to obtain.

Despite these challenges, we should remain inspired. Collaboration is at an all-time high, and technology is working in our favor to help shape the future of pediatric pain medicine. The international pediatric pain listserv helps promote consensus for pain challenges and provides real-time answers for pediatric pain questions from leaders in the field. Traditional societies, such as the Society for Pediatric Pain Medicine, strive to advance safe and efficacious pediatric pain management through education, research, and advocacy. Special interest groups in pediatric pain are also developing in adult pain and regional anesthesiology societies and surgery, pediatrics, and other subspecialty interest groups. Each year, more ACGME-accredited programs for pediatric pain medicine training are being added, and leaders in the field are collaborating to expand these programs even further. Dr. Stefan Friedrichsdorf, through his exceptional courses, has made pediatric pain education and resources readily available to health care practitioners in many disciplines. More institutions worldwide are holding pediatric pain educational conferences open to all who seek to further their education. Funding for pediatric pain research and infrastructure continues to grow, and telehealth is expanding patient access to care and services, even in these challenging times. It is our responsibility as health care professionals to be aware that pain remains undertreated in children. We must rise to the challenge of serving our pediatric patients who suffer from or may experience pain. We should strive for self-awareness of our biases and limitations when treating pediatric pain and ask for help when we need it. We should continue our education to advance our understanding of pediatric pain topics and research. We should develop education and support our colleagues and trainees to better care for their patients and remain intellectually curious so that we can identify and address knowledge gaps in the field. ■