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ESRA ITALIA

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Anestesia opioid free: è possibile nel bambino?

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Città della Salute e della Scienza di Torino

Si

può

fare

LOA: less opioid anesthesia

OFA: opioid free anesthesia/analgesia

REVIEW

CURRENT OPINION

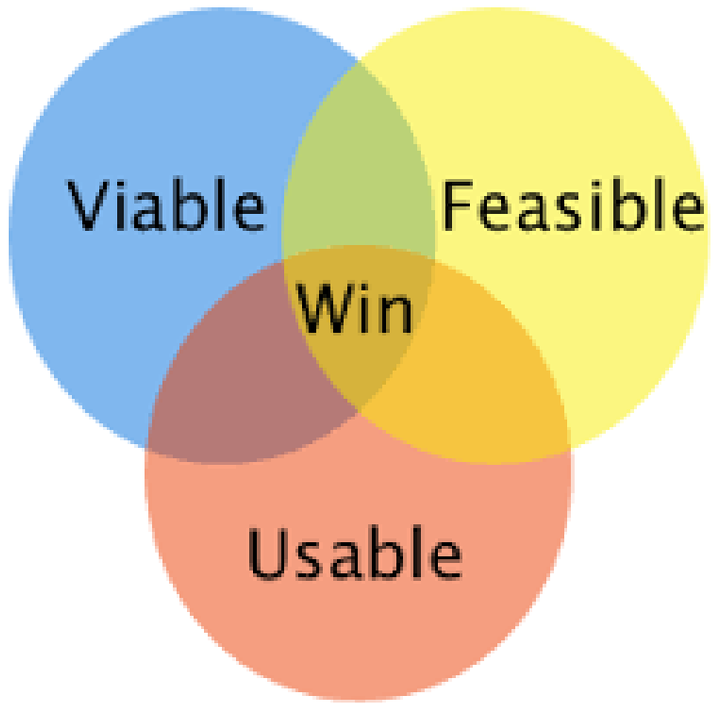
Opioid-free anesthesia: a different regard to anesthesia practice

Patricia Lavand'homme[a] *and Jean-Pierre Estebe*[b]

July 2018

Some advocates of enhanced recovery protocols recommend opioid-free anesthesia (OFA) for select procedures.
These OFA protocols replace intraoperative systemic, neuraxial, and intracavitary opioids with effective regional anesthesia and non-opioid analgesics, reserving opioids for rescue treatment in the postoperative period.

However, support for OFA is not universal: it is time to regain balance in anesthesia and states “OFA may be feasible, but current data do not support its wide-spread use”



Frauenknecht J, Kirkham KR, Jacot-Guillarmod A, Albrecht E. Analgesia impact of intra-operative opioids vs. opioid-free anaesthesia: a systematic review and meta-analysis. Anaesthesia.2019;74:651-662.
Salome A, Harkouk H, Fletcher D, et al. Opioid-free anesthesia benefit-risk balance: a systematic review and meta-analysis of randomized controlled trials. J Clin Med. 2021;10:2069.
Olausson A, Svensson CJ, Andreil P, et al. Total opioid-free general anesthesia can improve postoperative outcomes after surgery without evidence of adverse effects on patient safety and pain management: a systematic review and meta-analysis. Acta Anaesthesiol Scand. 2022;66:170-185.

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Opioid Crisis

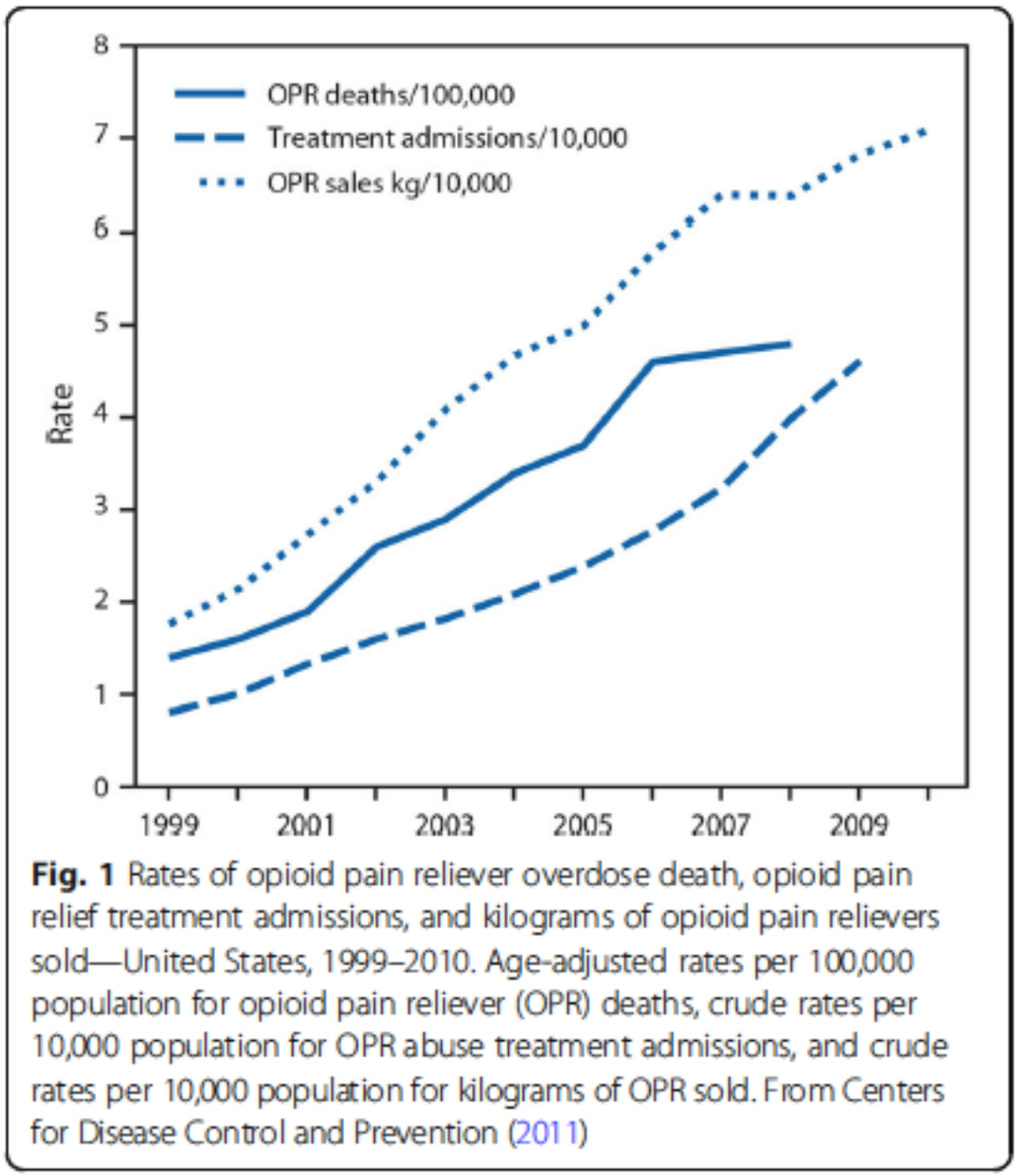


Fig. 1 Rates of opioid pain reliever overdose death, opioid pain relief treatment admissions, and kilograms of opioid pain relievers sold—United States, 1999–2010. Age-adjusted rates per 100,000 population for opioid pain reliever (OPR) deaths, crude rates per 10,000 population for OPR abuse treatment admissions, and crude rates per 10,000 population for kilograms of OPR sold. From Centers for Disease Control and Prevention (2011)

In 2017 the US government has declared the opioid epidemic as a public health emergency.
In the USA, opioid overdose has become a leading cause of unintentional death, surpassing motor vehicle accidents.

- 4.2% of the population over 12 years of age misused opioids
- 46,700 Americans died of an opioid overdose
- 17,029 of those deaths were from prescription opioids.

Exposure to opioids occurs via both legitimate and illegitimate routes, including prescriptions from healthcare providers, a subset of which are prescribed for perioperative pain management.

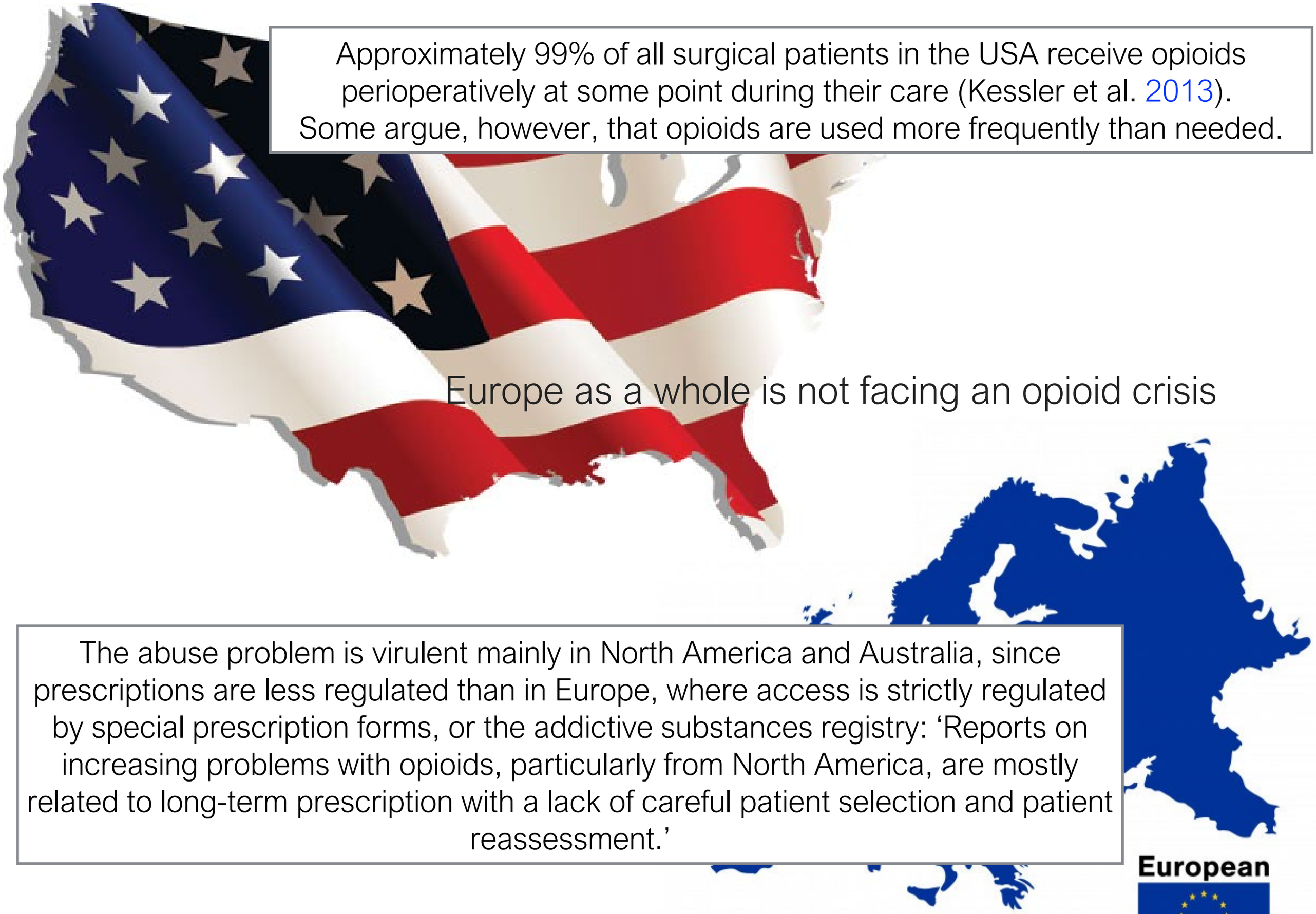
Bose J, Hedden SL, Lipari RN, Park-Lee E. Key substance use and mental health indicators in the United States: Results from the 2017 National Survey on Drug Use and Health.

Scholl L, Seth P, Kariisa M, Wilson N, Baldwin G. Drug and Opioid-Involved Overdose Deaths – United States, 2013–2017

Approximately 99% of all surgical patients in the USA receive opioids perioperatively at some point during their care (Kessler et al. 2013). Some argue, however, that opioids are used more frequently than needed.

Europe as a whole is not facing an opioid crisis

The abuse problem is virulent mainly in North America and Australia, since prescriptions are less regulated than in Europe, where access is strictly regulated by special prescription forms, or the addictive substances registry: ‘Reports on increasing problems with opioids, particularly from North America, are mostly related to long-term prescription with a lack of careful patient selection and patient reassessment.’



Children who have not taken opioids previously are often introduced to them just before, during, or after surgery, and this increases the risk of prolonged opioid use after surgery (POUS: ≥1 opioid prescription filled in the 90–180 days after surgery) and persistent postoperative opioid use (PPOU: ≥60 days of opioid prescriptions filled in the 90–365 days after surgery).

Bennett KG, Harbaugh CM, Hu HM, et al. Persistent Opioid Use Among Children, Adolescents, and Young Adults After Common Cle

Harbaugh CM, Lee JS, Hu HM, et al. Persistent Opioid Use Among Pediatric Patients After Surgery. Pediatrics. 2018;141(1)

While nearly six million medical procedures take place in children in the United States annually the risk of POUS and PPOU in this vulnerable population have not been as well-defined.

Previous studies assessed the risks of POUS and PPOU in children who underwent subsets of dental or surgical procedures and found it to be as high as 15%.

Harbaugh et al., investigated the incidence of ≥1 opioid prescription fill in the 90–180 days after surgery in opioid-naïve patients 13–21 years of age who underwent 1 of 13 surgeries: an incidence of 4.8% with the highest risk after cholecystectomy and colectomy and independent risk factors of older age, female, substance use disorder, chronic pain, and preoperative opioid prescription fill.

Another study of patients 8–25 years of age who underwent cleft palate surgery found an incidence of prolonged opioid use after surgery of 4.4% with higher risk associated with distractor placement, gastrointestinal comorbidity, and increasing age.

Anesth Analg. 2020 Oct;131(4):1237-1248.

Incidence of and Factors Associated With Prolonged and Persistent Postoperative

Andrew Ward [1], Elizabeth De Souza [2], Daniel Miller [1], Ellen Wang [2], Eric C Sun [2 3], Nicholas Bambos [1 4], T Anthony Anderson [2]

25% sample of patients in each age group. These patients acted as an 'unexposed' control group, with which we could c

Approximately 1% of 0–<2, 2–<6, and 6–<12-year-olds filled one or more opioid prescription 90–180 days after surgery, while approximately 4% of 12–18-year-olds did.

In the nonsurgical control groups, POUS occurred in <1% of patients among 0–<2, 2–<6, and 6–<12-year-olds, and approximately 2% in 12–18-year-olds.

Anesth Analg. 2020 Oct;131(4):1237-1248.

Incidence of and Factors Associated With Prolonged and Persistent Postoperative

Andrew Ward [1], Elizabeth De Souza [2], Daniel Miller [1], Ellen Wang [2], Eric C Sun [2 3], Nicholas Bambos [1 4], T Anthony Anderson [2]

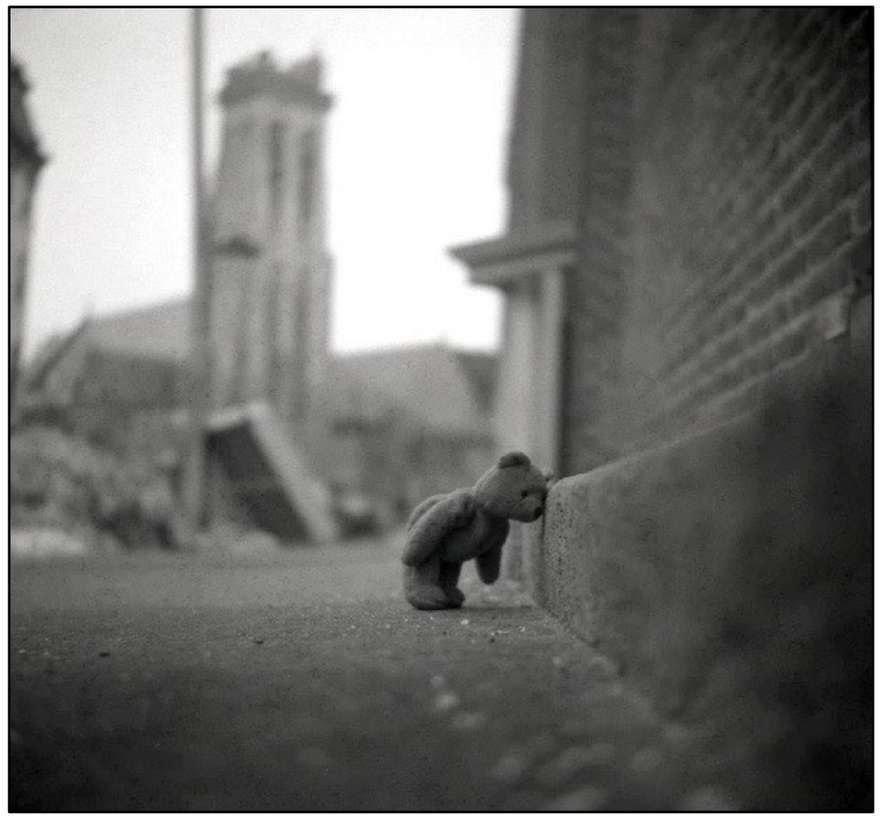
This study suggests that there are age-specific variables associated with POUS. Here, adolescents and teenagers were found to have a higher risk of POUS than younger patients.

Prior studies have revealed that adolescents and teenagers are a particularly vulnerable population for high risk behaviors, including substance abuse.

Patient cohorts, predictive risk factors could be used to monitor and minimize prolonged opioid use after surgery in this population.

This study also revealed that >2% of children 12–18 years of age who did not have surgery filled ≥1 opioid prescription within a 3 month time period. This finding should be further investigated to better understand non-perioperative pediatric opioid prescribing practices.

Anesthesiologists have been confronted to their responsibilities as perioperative opioid prescribers.



A patient's first exposure to opioids may be during the perioperative period, a time where anesthesiologists have a significant role in pain management.
Almost all patients in the USA receive opioids during a surgical encounter.

REVIEW Open Access

The rising tide of opioid use and abuse: the role of the anesthesiologist

Koepke *et al. Perioperative Medicine* (2018) 7:16

Elena J. Koepke[1], Erin L. Manning[2], Timothy E. Miller[1], Arun Ganesh[3], David G. A. Williams[1] and Michael W. Manning[1*]

Sedation
Somnolence
Constipation
Nausea & vomiting
Respiratory depression
Pruritus
Tolerance

It is possible children may tolerate higher levels of pain to avoid opioid-related PONV.

Respiratory depression is the most feared adverse effect of opioids, with an incidence in large pediatric audits (>10 000 patients) of 0.13% with opioid via continuous infusion, PCA, or NCA and 0.4% with opioid NCA in a younger population.

Morton NS, Errera A. APA national audit of pediatric opioid infusions. Pediatr Anesth 2010; 20: 119–125.
Howard RF, Lloyd-Thomas A, Thomas M et al. Nurse-controlled analgesia (NCA) following major surgery in 10 000 patients in a children's hospital. Pediatr Anesth 2010; 20:126–134.

Pediatric Anesthesia

Pediatric Anesthesia ISSN 1155-5645

Pediatric Anesthesia 23 (2013) 475–495

ORIGINAL ARTICLE

Opioid-sparing effects of perioperative paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) in children

Ivan Wong[1,2], Celia St John-Green[2] & Suellen M. Walker[1,3]

1 Department of Anaesthesia, Great Ormond St Hospital for Children NHS Foundation Trust, London, UK
2 School of Clinical Medicine, University of Cambridge, Addenbrooke's Hospital, Cambridge, UK
3 Portex Unit: Pain Research, UCL Institute of Child Health, London, UK

Best Practice & Research Clinical Anaesthesiology 31 (2017) 487–498

Contents lists available at ScienceDirect

Best Practice & Research Clinical Anaesthesiology

journal homepage: www.elsevier.com/locate/bean

3

Opioid-free anesthesia opioid side effects: Tolerance and hyperalgesia

Patricia Lavand'homme, MD, PhD, Professor *,
Arnaud Steyaert, MD, Assistant Professor

Department of Anesthesiology and Acute Pain Service, Cliniques Universitaires Saint Luc, University Catholic of Louvain, av Hippocrate 10, B-1200, Brussels, Belgium

Opioids remain the most potent drugs used to control severe pain.
However, neuroadaptation prevents opioids' ability to provide long-term analgesia and produces opposite effects, i.e., enhancement of existent pain and
facilitation of chronic pain development.
Neuroadaptation to opioids use yields to the development of tolerance and to a phenomenon called "opioid-induced hyperalgesia."

Tolerance: progressive lack of response: ↑ dose

OIH: increased pain sensitivity: stop opioid

Several drugs commonly used in perioperative anesthesia as "analgesic adjuvants" among others ketamine, pregabalin, magnesium and nitrous oxide attenuate the development of OIH and hence should be considered as "antihyperalgesic adjuvants."

Kharasch ED, Brunt LM. Perioperative opioids and public health. Anesthesiology 2016;124(4):960e5.
Rivat C, Ballantyne J. The dark side of opioids in pain management: basic science explains clinical observation. Pain Rep 2016;1:e570.
Chapman CR, Stevens DA, Lipman AG. Quality of postoperative pain management in American versus European institutions. J Pain Palliat Care Pharmacother 2013;27(4):350e8.

Best Practice & Research Clinical Anaesthesiology 31 (2017) 547–560

Contents lists available at ScienceDirect

Best Practice & Research Clinical Anaesthesiology

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Special indications for Opioid Free Anaesthesia and Analgesia, patient and procedure related: Including obesity, sleep apnoea, chronic obstructive pulmonary disease, complex regional pain syndromes, opioid addiction and cancer surgery

Adrian Sultana, MD FRCP FANZCA, Anaesthetist [a, *],
David Torres, MD, MSc, Director of Outcome Research [b],
Roman Schumann, MD, Professor of Anesthesiology and Perioperative Medicine [c]

The perioperative period of major oncologic surgery is characterized by immunosuppression, angiogenesis, and an increased load of circulating malignant cells. It is a window period in which cancer cells may seed, invade, and proliferate. Thus, it has been hypothesized that the use of regional anesthesia with the goal of reducing surgical stress and opioid and volatile anesthetic consumption would avoid perioperative immune suppression and angiogenesis and ultimately cancer recurrence.

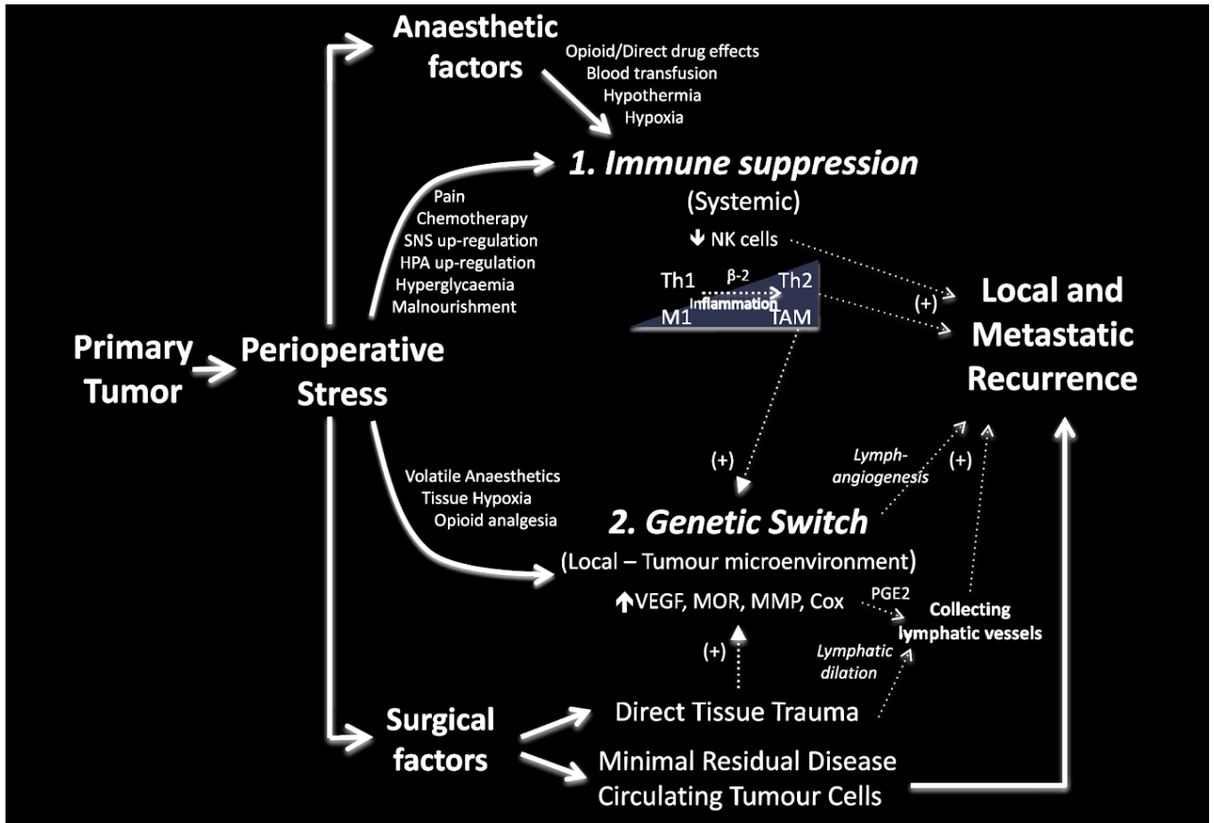


Fig. 1. Perioperative factors and their potential impact on cancer recurrence. Abbreviation: SNS – Sympathetic Nervous System; TAM – Tumour-Associated Macrophage; HPA – Hypothalamic–Pituitary Axis; NK – Natural Killer; VEGF – Vascular Endothelial Growth Factor; MOR – Mu-opioid Receptor; MMP – Matrix Metalloproteinase; Cox – Cyclooxygenase; PGE2 – Prostaglandin E2.

Basic science would suggest that patients having surgery for primary cancers may benefit from avoiding the immuno-depressant effects of opioids, and this technique has been clinically successful in breast and colorectal oncological surgery for reducing acute surgical pain.

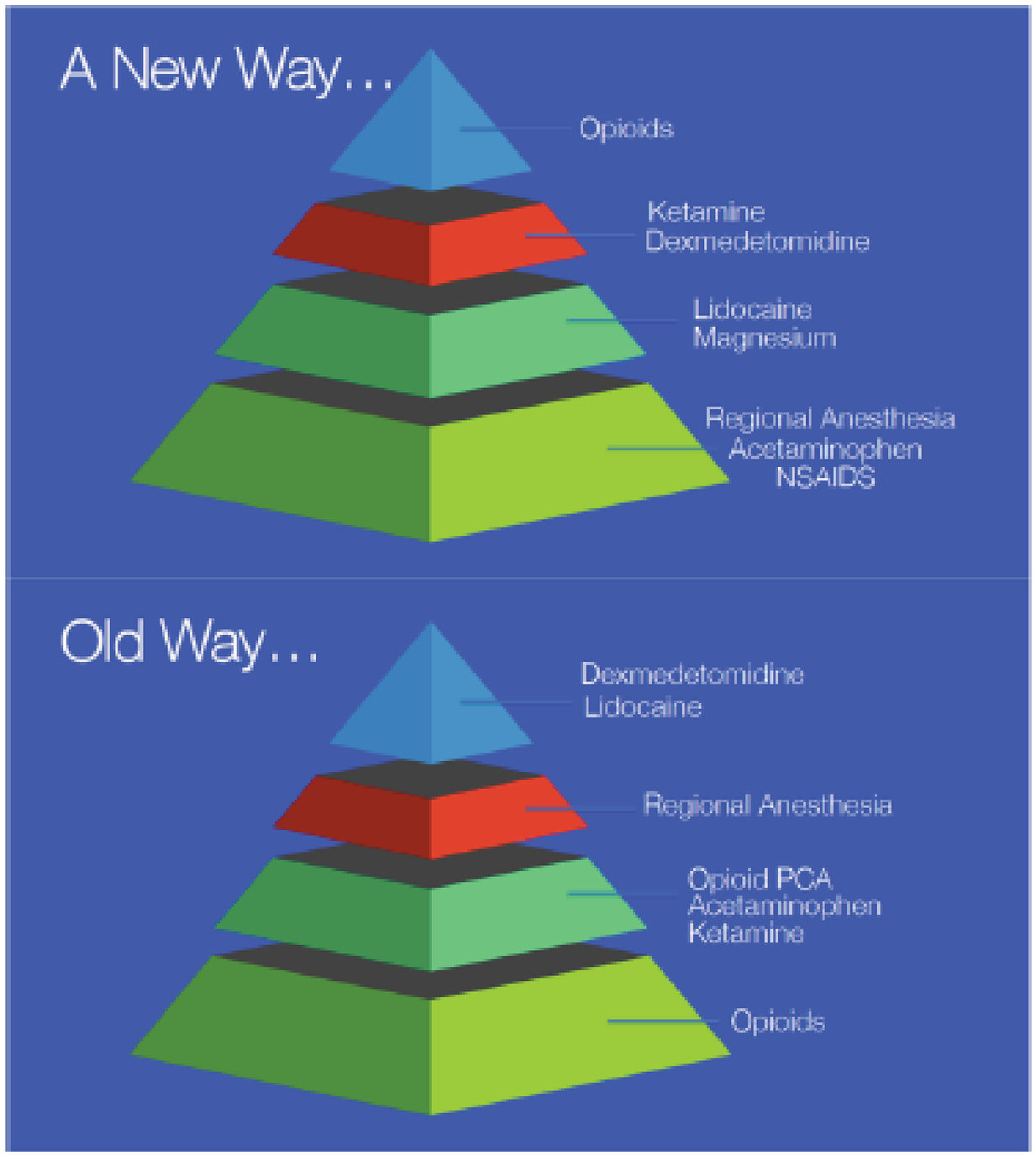


Fig. 2 New paradigm in analgesia management. The old way of management of pain has relied on opioids as the foundation of pain control, with non-opioid adjuncts added if necessary due to patient condition. In the new way, management of pain begins with non-opioid-based techniques that are evidence based and demonstrated to decrease opioid use

Minimally invasive surgical approaches, discontinuation of nasogastric tubes, early ambulation, which likely have the strongest impact on recovery after surgery.

The use of these strategies has been shown to decrease the length of stay in recovery rooms and reduce the burden in healthcare resources, while improving patient quality of life and satisfaction.

RA a component of any perioperative multimodal analgesia or enhanced recovery after surgery (ERAS) pathway (Grant et al. 2017).

Both neuraxial and peripheral nerve blocks can be used concurrently with an opioid-free anesthetic.

With Fascial Plane Block at least an opioid sparing anesthesia/ analgesia

Acetaminophen, even a single pre- or intraoperative dose, regardless of the route used, appears to be effective at decreasing postoperative pain and/or opioid consumption after a variety of pediatric surgeries as long as a therapeutic dose is used.

Pediatric Anesthesiology
Section Editor: James A. DiNardo
SYSTEMATIC REVIEW ARTICLE

of Systemic Opioid-Sparing
urgical Populations: A

and T. Anthony Anderson, MD, PhD*

Perioperative NSAID use, regardless of type, decreases postoperative pain and/or opioid consumption in pediatric patients after a variety of pediatric surgeries.

c Anesthesia
Pediatric Anesthesia ISSN 1155-5645

perioperative paracetamol and
AIDs) in children

A single, intraoperative dose of dexamethasone decreases pain measures after tonsillectomy in children.

n, UK

Intraoperative ketamine decreases early postoperative pain and/or opioid consumption in pediatric patients after a variety of minor, outpatient surgeries.

CrossMark

Dexmedetomidine
Compared with Placebo for Postoperative Pain

es

Oral clonidine at a dose of 4 μg·kg$_{-1}$ decreases postoperative pain measures in children after a variety of minor surgeries.

Intraoperative dexmedetomidine, especially if at least 0.5 μg·kg$_{-1}$ is given, decreases postoperative pain measures in pediatric patients after a variety of ambulatory surgeries.

Of the 2 published

gabapentin studies, both in children undergoing spine surgery, only 1 found a reduction in postoperative pain measures when gabapentin was given perioperatively for 5 days; however, patients in the negative outcome study received a single preoperative dose.

Two studies evaluated

intraoperative magnesium and did not find it efficacious in decreasing pediatric pain measures after tonsillectomy. One magnesium study found a decrease in postoperative analgesic consumption when given during orthopedic surgery in pediatric patients with cerebral palsy.

The 1 published

dextromethorphan pediatric study showed that a single preoperative dose decreased postoperative pain measures

Pediatric Anesthesia

Pediatric Anesthesia. 2023;33:699–709.

Pediatric Anesthesia ISSN 1155-5645

Outcomes for 41 260 pediatric surgical patients with opioid-free anesthesia: One center's experience

Lynn D. Martin[1] | Amber M. Franz[2] | Sally E. Rampersad[2] | Bukola Ojo[2] | Daniel K. Low[2] | Lizabeth D. Martin[2] | Agnes I. Hunyady[2] | Sean H. Flack[2] |Jeremy M. Geiduschek[2]

In a series of Quality Improvement (QI) projects, multidisciplinary teams developed interventions to test and spread OFA first in our ambulatory surgery center (ASC) and then in our hospital.

Results: Between January 1, 2016, and September 30, 2022, 19 872 of 28 574 ASC patients received OFA, increasing from 30% to 98%.
Post Anesthesia Care Unit (PACU) maximum pain score, opioid-rescue rate, and postoperative nausea and vomiting (PONV) treatment all decreased concomitantly.
The use of OFA now represents our ambulatory standard practice.

Over the same timeframe, the spread of this practice to our hospital led to 21 388 of 64 859 patients undergoing select procedures with OFA, increasing from 15% to 60%.
Opioid rescue rate and PONV treatment in PACU decreased while hospital maximum pain scores and length of stay were stable.

Two procedural examples with OFA benefits were identified. The use of OFA allowed relaxation of adenotonsillectomy admission criteria, resulting in 52 hospital patient days saved.

Transition to OFA for laparoscopic appendectomy occurred concomitantly with a decrease in the mean hospital length of stay from 2.9 to 1.4 days, representing a savings of >500 hospital patient days/year.

Anesth Analg 2021;132:788–97

In Pursuit of an Opioid-Free Pediatric Ambulatory Surgery Center: A Quality Improvement Initiative

Jennifer M. Franz, MD, MEng, Lynn D. Martin, MD, MBA, David E. Liston, MD, MPH, Gregory J. Latham, MD, Michael J. Richards, BM, and Daniel K. Low, BM, BS

RESULTS: Between January 2017 and June 2019, 10,948 surgeries were performed at Bellevue.
Between December 2017 and June 2019, intraoperative opioid administration at our institution decreased from 84% to 8%, and postoperative morphine administration declined from 11% to 6% using analgesics such as dexmedetomidine, nonsteroidal anti-inflammatory drugs, and regional anesthesia.
Postoperative nausea and vomiting rescue rate decreased, while maximum postoperative pain scores, total anesthesia minutes, and total postanesthesia care unit minutes remained stable.

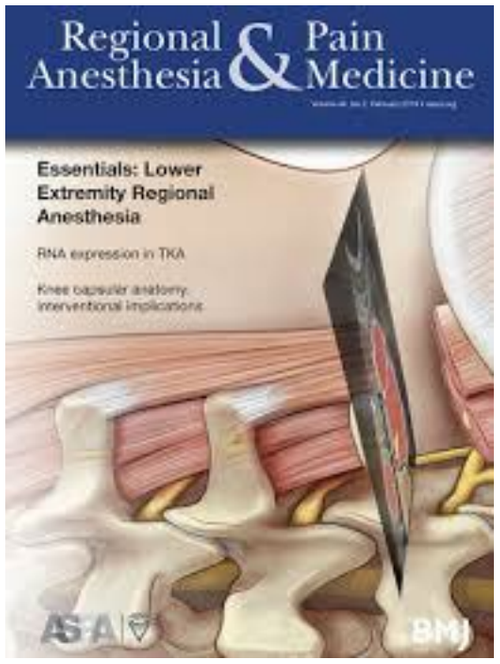
CONCLUSIONS: By utilizing dexmedetomidine, nonsteroidal anti-inflammatory drugs, and regional anesthesia for pediatric ambulatory surgeries at our facility, perioperative opioids were minimized without compromising patient outcomes or value.

Can J Anesth/J Can Anesth (2024) 71:727–730

Regional anesthesia in complex pediatric patients: advances in opioid-sparing analgesia

Tristan C. Dumbarton, MD, FRCPC

RA performed for orthopedic surgeries in children diagnosed with cerebral palsy (CP).
While every child with CP is unique in their needs and clinical presentation, a common finding is a limited ability to communicate pain and other needs with the perioperative team. Additionally, children with CP often have other comorbidities, such as restrictive lung disease, recurrent aspirations, malnutrition, seizure disorders, and severely reduced mobility, which can put these children at higher risk of injury under general anesthesia and postoperatively. Typical opioid regimens could easily lead to oversedation and subsequent aspiration or position-related pressure ulcers



Reg Anesth Pain Med 2024;0:1–7.

Use of regional anesthesia within a pediatric interventional radiology suite reduced periprocedural opioid use without delaying the overall workflow: a retrospective study

Jordan I Gaelen , Chunyi Wu, Amy Yang, Shankar Rajeswaran, Alina Lazar, Eric C Cheon, Angelica A Vargas

309 pediatric patients undergoing interventional radiology (IR) procedures, specifically sclerotherapy for bone cysts, venous malformations, and lymphatic malformations.

Results —> Opioid Use Reduction: Patients who received nerve blocks required significantly fewer opioids both during and after procedures. 1. For bone cysts, 62.7% of block patients used opioids compared to 100% of non-block patients. 2. In venous and lymphatic malformations, 65.7% of block patients required opioids versus 97.4% of non-block patients. Pain Scores: Maximum post-anesthesia care unit (PACU) pain scores were significantly lower in bone cyst patients receiving nerve blocks. Workflow Efficiency: The use of regional anesthesia did not delay the overall workflow. In bone cyst cases, the postprocedural time was reduced by 13 minutes.
Conclusion —> 1. Regional anesthesia effectively reduced opioid requirements and postprocedural pain in pediatric IR procedures, particularly in bone cyst cases. 2. The study suggests that nerve blocks can be a valuable part of multimodal analgesia in pediatric IR settings, with potential benefits in reducing opioid exposure without impacting procedure duration.

BMJ Journals

BMJ Open 2024;14

Assessing the relative efficacy of components of opioid-free anaesthesia in adult surgical patients: protocol for a systematic review and component network meta-analysis

Amparo Belltall, Guido Mazzinari , Aisling N. Eochag.in, Tom Wall, Ary Serpa Neto, Oscar Diaz-Cambronero , Daniel Sessler , Donal J Buggy , Juan Cata , Markus W Hollmann

We designed a protocol for a cNMA to assess whether OFA is effective compared with usual opioid-based practice.
Moreover, we aim to determine which OFA components are associated with the greatest benefit on postoperative outcomes, including postoperative pain and side effects, patient-reported recovery, chronic pain and chronic opioid medication use, and cancer recurrence.

The results of this study will also provide guidance for future clinical trials.

Opioid free anaesthesia: Myth or reality?

Despite enthusiasm for OFA, many questions remain unanswered:

- The need for specialized anaesthetic skills to administer regional techniques.
- Potential side effects from combining non-opioid drugs, including hypotension and toxicity.
- Lack of robust, large-scale studies to establish the safety and efficacy of OFA protocols across diverse patient populations.

There is currently a lack of accurate monitoring to measure intraoperative nociception.
Sympathetic/parasympathetic balance is generally used to address the adequacy of intraoperative antinociception.
As ‘nociception’ is still too often misunderstood as ‘pain’ and also because it is well established that nociceptive inputs reaching the central nervous system cause central sensitization, which in turn participates to acute and persistent postoperative pain, anesthesiologists need a direct assessment of intraoperative nociception.

ELSEVIER

SFAR
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Review article

Opioid-free anaesthesia. Why and how? A contextual analysis

Patrice Forget

Department of anaesthesiology and perioperative medicine, Universitair Ziekenhuis Brussel (UZ Brussel), Vrije Universiteit Brussel (VUB), Laarbeeklaan 101, 1090 Brussels, Belgium

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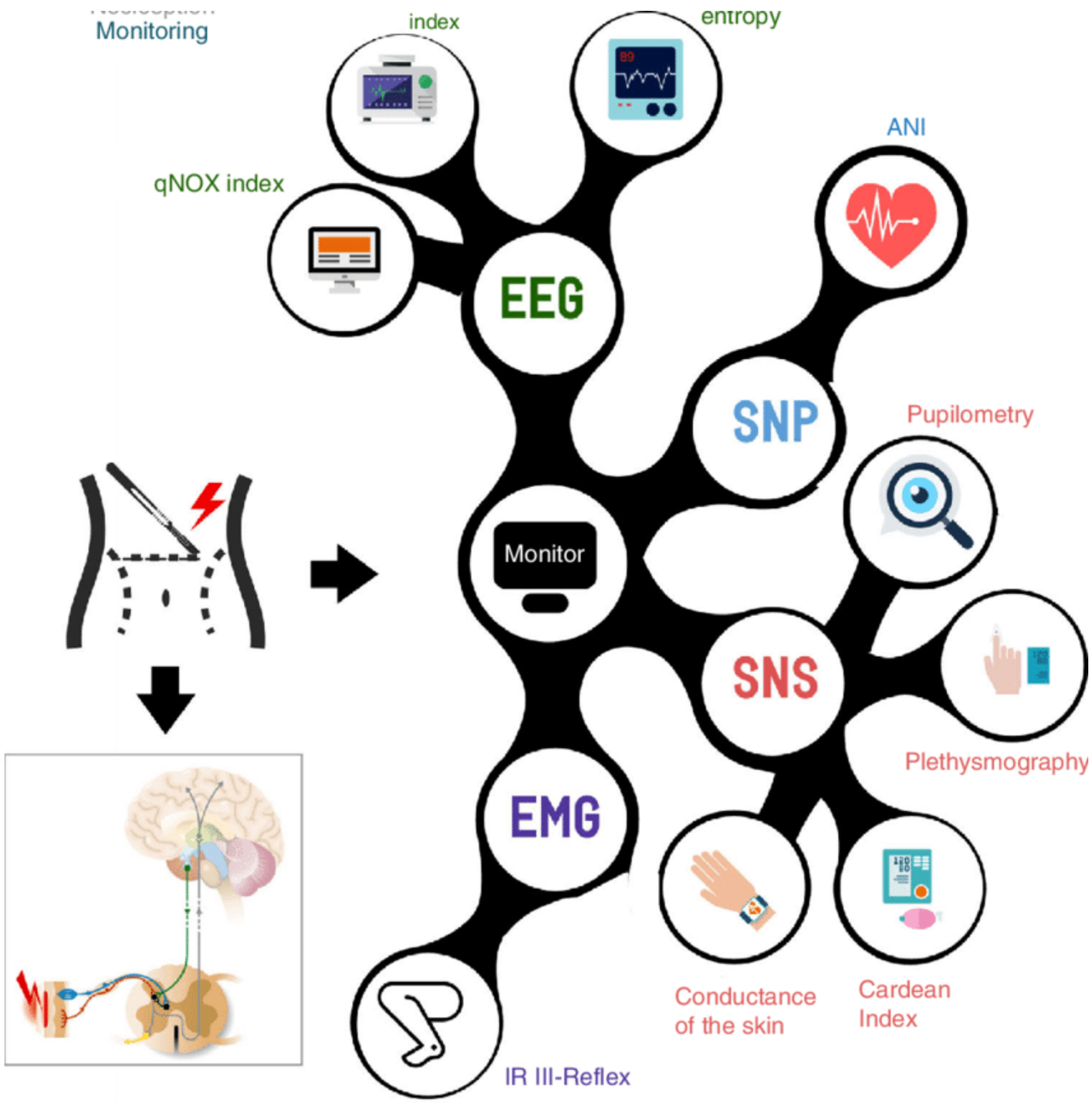
Review
Can Opioid-Free Anaesthesia Be Personalised?
A Narrative Review

J. Pers. Med. 2023, 13, 500

Jenna Goff, Morgan Hina, Nayaab Malik, Hannah McLardy, Finley Reilly,
Matthew Robertson, Louis Ruddy, Faith Willox and Patrice Forget



Nociception
Monitoring in OFA

Grazie

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