

# *Perioperative use of opioids in ambulatory surgery: risk or necessity?*

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**REFRESHER  
COURSE**

No conflict of interest to declare

# Evolution of ambulatory and outpatient surgery

- Volume has grown over the past 20 years with advances of surgery and anesthesia techniques (including very complex and painful procedures)
- Almost 60% of all surgical procedures (up to 70 – 80% in US and UK)
- Patients with increasing co-morbidities, frailty patients
- Traditional outcomes of major morbidity and mortality are less relevant in ambulatory setting (rare complications)

# Patient-reported outcomes after surgery

End-point	Recommended measure
Postoperative pain intensity at rest and movement at 24 h	Numerical rating scale (0 = no pain 10 = maximum pain descriptor)
Incidence of postoperative nausea and vomiting/retching and nausea and vomiting Early (0–6 h) Late (6–24 h) Overall	Incidence (%) and proportion using antiemetic (%)
QoR	QoR (9 item) or QoR-15 (15 item)
Time to gastrointestinal recovery	Time to oral diet being tolerated
Time to mobilization	Time to mobilization
Incidence of sleep disturbance	PROMIS Scale

Use of patient-reported outcomes allows identification of minor adverse events that are more common in the ambulatory surgical population than traditional endpoints of mortality or serious morbidity.

But could result

- in delay in discharge
- in readmission

# Why do Anesthetists currently use intraoperative opioids?



- Most comfortable choice
- **Standard of care**
- Opioids fit into the concept of the **evolution of anesthesia**
  - Hemodynamic stability
  - Analgesic effect : humanity concept
  - Block of nociceptive inputs: ↓ central nervous system sensitization
  - Part of current multimodal « balanced » anesthesia

# Post-discharge nausea and vomiting

<b>PDNV in adults</b>		
<b>C</b>	Female gender	1
	History of PONV	1
	Age <50 years	1
	Use of opioids in the PACU	1
	Nausea in the PACU	1
	<b>Maximum score</b>	<b>5</b>
<b>PDV in children</b> <sup>32,33</sup>		
<b>D</b>	Strabismus, tonsillectomy, and dental surgery	1
	Intraoperative or postdischarge opioids	1
	Long-acting intraoperative opioids	1
	Pain	1
	Presence of nausea on discharge	1
	<b>Maximum score</b>	<b>5</b>

(C) When 0, 1, 2, 3, 4, and 5 risk factors are present, the corresponding risk for PDNV is approximately 10, 20, 30, 50, 60, and 80%, respectively

(D) PDNV incidence of 11–14% in outpatient pediatric patients  
Long-acting opioids in operating room as well as during postdischarge had the highest incidence of PDNV at 36%

# Minimizing intraoperative opioids reduces PONV

- **Higher intraoperative fentanyl dose is associated with higher risk of PONV**

- Prospective cohort study (N=363)

- 45% patients had PONV despite TIVA and use of antiemetic drugs

- Higher intraoperative fentanyl was associated with higher 24h pain scores

- **Intraoperative fentanyl is a modifiable risk factor**

(Mauermann et al, EJA 2019)

- **Opioid-free anesthesia is associated with a 20% reduction of PONV**

- meta-analysis of 23 RCTs (N=1304)

- Even in presence of postoperative opioid analgesics administration

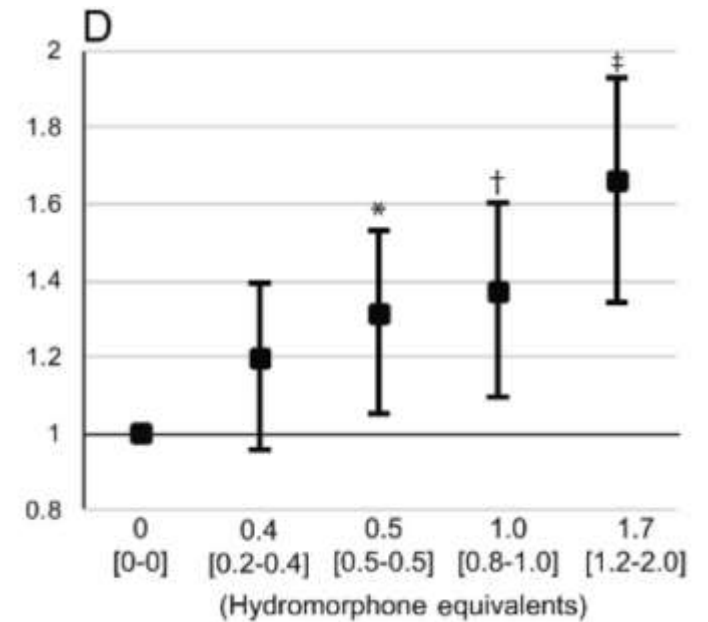
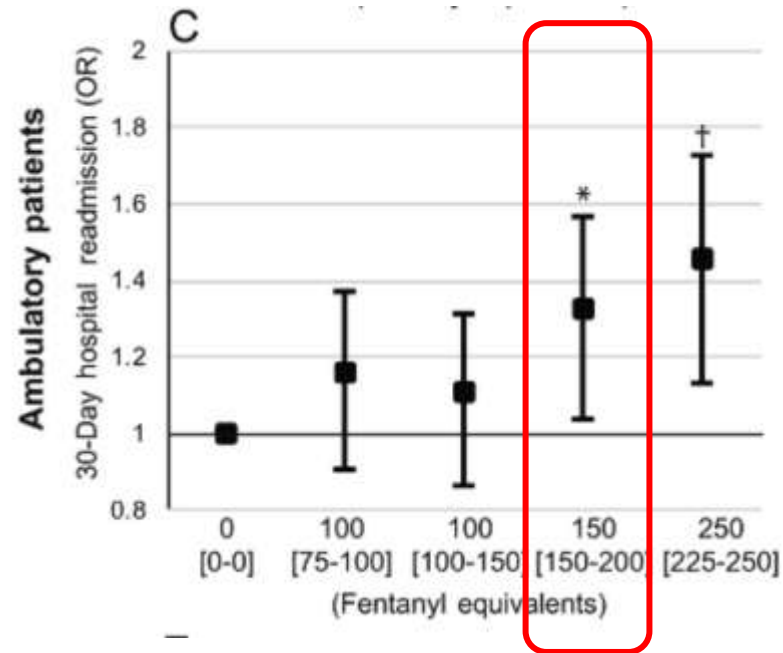
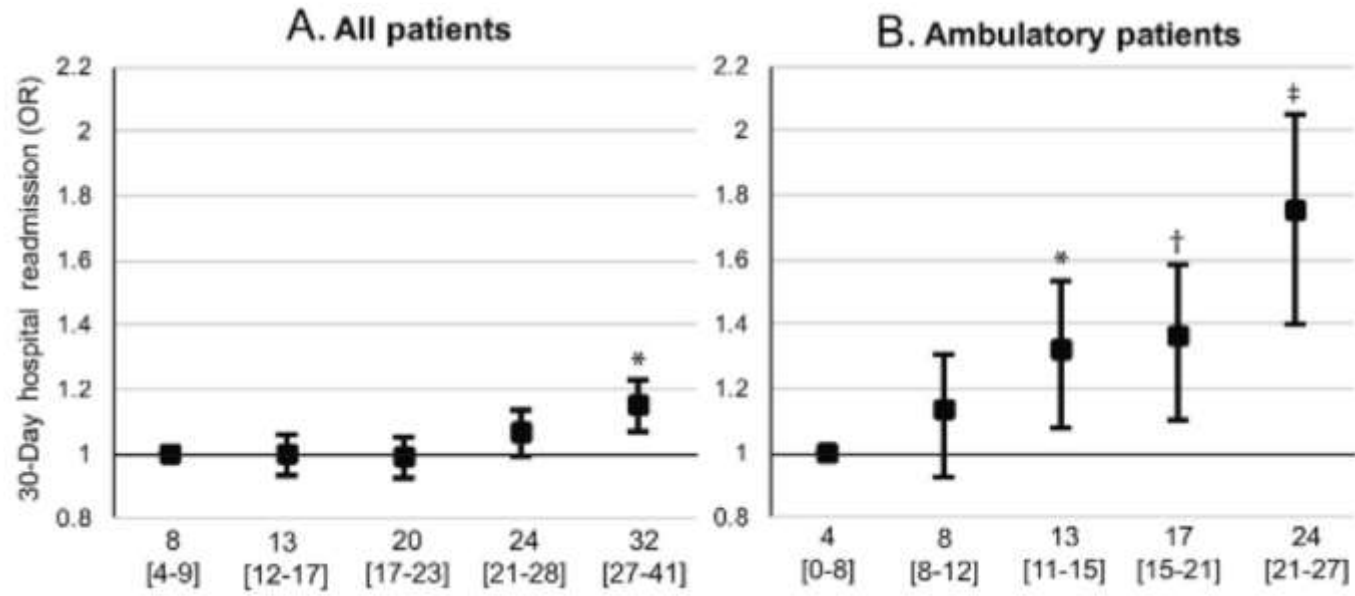
(Frauenknecht et al, Anaesthesia 2019)

# Association between intraoperative opioid administration and 30-day readmission: a pre-specified analysis of registry data from a healthcare network in New England

Long et al, BJA 2018

- Registry data including 153 902 patients (ambulatory, N=40 060)
- Model using robust confounder controls
- Intraoperative high dose of opioid (32 mg ME; 27-41 mg)  $><$  OLA (8 mg ME; 4-9 mg) is independent predictor of 30-days readmission [OR: 1.15;  $p < 0.001$ ]
- Readmission not affected by preoperative opioid intake
- **Higher risk for ambulatory surgery**
  - Clear dose-related effect
  - Impact of the type of intraoperative opioid used (! Longer acting opioids)





Long et al, BJA 2018

## Higher risk in ambulatory surgery

- Readmissions related to
  - Surgical site infections [OR:1.22]
  - Pain [OR:1.12]
- **Marked differences in the pattern of intraop opioids use among anesthesiologists**

Activation of bacterial opioid receptors on *Pseudomonas* and *Enterococcus* common strains can induce key virulence factors, driving the transition from colonisation to infection

(Babrowski et al, Ann Surg 2012; Shakhsheer et al, J Gastrointest Surg 2016)

JAMA Surgery | **Original Investigation**

# New Persistent Opioid Use After Minor and Major Surgical Procedures in US Adults

Chad M. Brummett, MD; Jennifer F. Waljee, MD, MPH, MS; Jenna Goesling, PhD; Stephanie Moser, PhD; Paul Lin, MS; Michael J. Englesbe, MD; Amy S. B. Bohnert, PhD, MHS; Sachin Kheterpal, MD, MBA; Brahmajee K. Nallamothu, MD, MPH



JAMA 2017

## Procedure-specific and patient-specific pain management for ambulatory surgery with emphasis on the opioid crisis

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*Johan Raeder*

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Curr Opin Anesthesiol 2020

# Pre-emptive and preventive opioids for postoperative pain in adults undergoing all types of surgery (Review)



2018

Doleman B, Leonardi-Bee J, Heinink TP, Bhattacharjee D, Lund JN, Williams JP

- NO evidence that preventive opioids result in reduction in pain scores
  - Not clear that preventive opioids decrease postoperative morphine use (low quality of evidence)
  - Too few studies reporting adverse events
- There is currently sufficient evidence to question the fact that **intra**operative opioids contribute to improve postoperative outcome in term of analgesia and recovery in the patients

## A crucial administration timing separates between beneficial and counterproductive effects of opioids on postoperative pain

Erica Suzan<sup>a,b,\*</sup>, Dorit Pud<sup>b</sup>, Elon Eisenberg<sup>a,c</sup>

- **>< analgesic effect when administered « after surgery has ended »**
- The **opioids appear to preferentially reduce the affective dimension of pain experience rather than the sensory dimension** (Porreca et al, Pain 2017; Price et al, Pain 1985)
- Opioids reduce activation of affective areas of the brain at lower doses than sensory areas in functional magnetic resonance imaging studies (Oertel et al, Clin Pharmacol Ther 2008)

# Opioid-free Anesthesia: Time to Regain Our Balance

Evan D. Kharasch, M.D., Ph.D., J. David Clark, M.D., Ph.D.

To balance the benefits of **no** intraoperative opioid with the potential side effects of **multimodal non-opioid adjuvants combination**



“Opioid-free anesthesia may be feasible. Nevertheless, it appears neither logical nor beneficial to patients.”

# Remifentanil for abdominal surgery is associated with unexpectedly unfavorable outcomes

Pain 2020

Sebastian Niedemayer<sup>a</sup>, Jens Heyn<sup>a</sup>, Felix Guenther<sup>b</sup>, Helmut Küchenhoff<sup>b</sup>, Benjamin Luchting<sup>a,c,\*</sup>

- Electronic medical records data base (N=55 693)
- Intraoperative remifentanil associated to higher postoperative pain scores despite higher postoperative analgesics use (even with epidural analgesia)
- Remifentanil should be avoid in **procedures in which high postoperative pain scores** are expected, « *unreflective use should be critically questioned* »

JNeurosci  
THE JOURNAL OF NEUROSCIENCE

2019

*Research Articles: Systems/Circuits*

Altered signaling in the descending pain modulatory system after **short-term** infusion of the  $\mu$ -opioid agonist remifentanil

Christian Sprenger<sup>1,2</sup>, Iris-Carola Eichler<sup>3</sup>, Lars Eichler<sup>3</sup>, Christian Zöllner<sup>3</sup> and Christian Büchel<sup>1</sup>

## Editorials

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### Pain management after ambulatory surgery – Where is the disconnect?

Paul F. White PhD MD FANZCA

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Can J Anesthesiol 2008

- Multiple publications about the reality of severe pain after discharge in ambulatory patients
- Impact of early discharge pain (first week) on the quality of recovery (Stessel et al, PLOS One 2021;.....)



# Optimizing recovery after ambulatory surgery



- Reduction of intra-operative and PACU opioids administration (opioid sparing strategies: drugs and monitoring)
- Careful choice of non-opioid adjuvants and their combination as well as adequate analgesic techniques
- Anticipation of postoperative opioids requirements

# Ambulatory surgery pain management



- Procedure-specific guidelines
- Patient-specific management → **anticipation** of perioperative pain management and education
  - Is this patient with extra risk factors of **stronger postoperative pain** than average? *Well known risk factors*
  - Is this patient with any **contraindications or other concerns** regarding the procedure-specific **recommended drugs or procedures**?
  - Is this patient with extra risks of becoming an opioid misuser?

(Reader J. Curr Opin Anesthesiol 2020)

# Educating Patients Regarding Pain Management and Safe Opioid Use After Surgery: A Narrative Review

Bradley H. Lee, MD,\*† and Christopher L. Wu, MD,\*†

Anesth Analg 2019

## Pre-packed take-home analgesics in ambulatory surgery

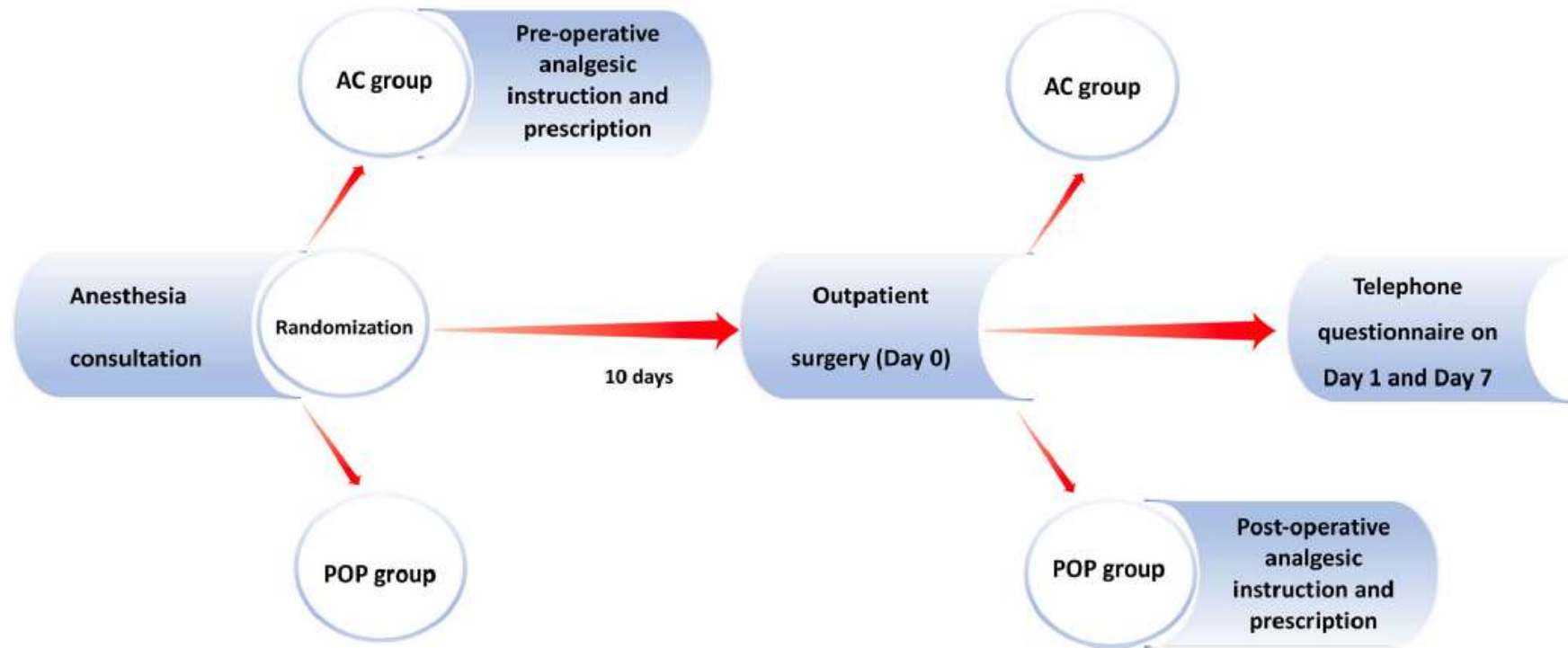
Johanna B. Lindahl<sup>a</sup>, Per Nydert<sup>a</sup>, Kajsa Giesecke<sup>b,c</sup>,  
Peter M. Persson<sup>a</sup>, Tomas Movin<sup>d</sup>, Märta Segerdahl<sup>b,\*</sup>

Acute Pain 2006

We conclude that pre-packed medication is an opportunity to provide patients with an easy method of handling postoperative analgesics, but a high frequency of drug related adverse events and the absence of better analgesia indicates that customised analgesic therapies are warranted.

# Preoperative analgesic instruction and prescription reduces early home pain after outpatient surgery: a randomized controlled trial

Can J Anesth  
2021



- Randomized patients (N=186)
- Less postoperative pain at rest in AC group at day 1 (24% vs 48%) and higher treatment compliance
- No difference at day 7 (no difference in PONV from day 1 to day 7)

# Conclusion

## Perioperative opioids in ambulatory surgery

- Opioids remain the most potent analgesics currently available: balance between benefits linked to pain relief and side effects (not only PDNV!)
- Intra-operative opioids administration
  - Should be minimized (analgesic adjuvants? Which ones? Combination?)
  - Choice of the opioid molecule (long acting opioids? Remifentanyl?)
- Better to reserve opioid analgesics for the postoperative period
- Mandatory to educate patients about postoperative pain, opioid analgesics use and to anticipate difficult postoperative pain management