Function First, Opioids Last:
Minimizing Opioids in the Perioperative Period While Targeting Optimal Analgesia After Surgery

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Disclosures

• GE Foundation – educational capacity building research in East Africa

• Edwards Lifesciences – GDFIT research within ERAS

• Cheetah Medical – GDHT research within ERAS
Goals and Objectives

By the end of this session the learner should be able to:

• Discuss **optimal analgesia as the goal** of perioperative pain control and **why it is important**.
• Describe **maximodal analgesia** as an approach for **opioid minimization** while achieving optimal analgesia
• Discuss a **structured approach for rescue analgesia** consistent with ERP principles
• Describe gaps in the literature and areas for **future research**
American Society for Enhanced Recovery (ASER) and Perioperative Quality Initiative (POQI) joint consensus statement on optimal analgesia within an enhanced recovery pathway for colorectal surgery: part 1—from the preoperative period to PACU

Matthew D. McEvoy, Michael J. Scott, Debra B. Gordon, Stuart A. Grant, Christopher L. Wu, Tong J. Gan, Monty G. Mythen, Andrew D. Shaw, and For the Perioperative Quality Initiative (POQI) I Workgroup

American Society for Enhanced Recovery (ASER) and Perioperative Quality Initiative (POQI) Joint Consensus Statement on Optimal Analgesia within an Enhanced Recovery Pathway for Colorectal Surgery: Part 2—From PACU to the Transition Home

Michael J. Scott, Matthew D. McEvoy, Debra B. Gordon, Stuart A. Grant, Julie K. M. Thacker, Christopher L. Wu, Tong J. Gan, Monty G. Mythen, Andrew D. Shaw, Timothy E. Miller, and For the Perioperative Quality Initiative (POQI) I Workgroup
Q1: What is the definition of optimal analgesia after surgery?

- **Statement:** Optimal analgesia can be defined as a technique that optimizes patient comfort and facilitates recovery of physical function including the bowel, mobilization, cough and normal sleep, while minimizing adverse effects of analgesics.

- **Proviso:**
  - this may not correspond with the lowest pain perception possible.
  - the *combination* of analgesic techniques employed...
Optimal Analgesia After Surgery

Optimized Patient Comfort
- Optimal Pain Rating
  - At Rest
  - With Movement
- Impact of Pain on Emotions
- Impact of Pain on Function
- Sleep disruption
- Improve Patient Experience

Fastest Functional Recovery
- Drinking Liquids
- Eating Solid Foods
- Activities of Daily Living
- Mobilizing
- Bladder function
- Bowel function

Fewest Side Effects
- Delirium
- Respiratory Depression
- Sedation
- Ileus/Nausea
- Dizziness
- Itching

Encourages Postoperative DREAMS
[DRinking, Eating, Analgesia, Mobilizing, and Sleeping]
Q2: Why should opioid use be minimized for surgical patients?

Statement: Minimizing opioid analgesia for surgical patients reduces the adverse effects of opioid use.
Fentanyl Citrate Injection
(100 mcg per 2 mL)
50 mcg per mL
2 mL Total Volume
For IV Use
2R3303
CII
RT STORAGE
PROTECT FROM LIGHT
Must have the PRECIOUS!
Opioid-Related Side Effects

Opioid hallucinations have been most strongly associated with morphine and tramadol, and are one of many potential adverse effects.¹

- Respiratory Depression: 20%
- Sleep disorders: 25%
- Memory deficits: 24%
- Drowsiness: 14-29%
- Xerostomia: 42%
- Constipation: 20-41%
- Nausea: 17-33%
- Weight gain: 29%
- Urinary retention: 4.18%
- Sexual dysfunction: 25%
- Pruritus: 10%
- Sweating: 34%
- Depression: 80%

Treatment Options:
- Decrease opiate dose
- Rotate opiate class
- Add: Opiate antagonist, multimodal analgesia, Phystostigmine, Haloperidol, Diazepam

There were 16,235 opioid-related deaths in 2013 (71% of all pharmaceutical deaths).³

Perioperative strategies employed to prevent or limit the duration of POI include avoidance of preoperative fasting, mechanical bowel preparation, use of epidural-local anesthetics, implementation of minimally-invasive surgical techniques, and modification of pain management strategies to limit opioid administration.

The experts’ opinion was in concordance with the recent guidelines and systematic reviews: the use of non-steroidal anti-inflammatory drugs and narcotic-sparing analgesia (for example, epidural analgesia for open procedures) proved to reduce the time of bowel function recovery.
Long-Term Adverse Consequences

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

Key Points

**Question** What is the incidence of new persistent opioid use after

- **Sample criteria**
  - No opioid prescriptions 11 mo prior to procedure
  - ≥1 Opioid prescription 30 d before procedure date through 2 wk after discharge

- **New persistent opioid use**
  - ≥1 Opioid prescription 90-180 d after surgery

**Meaning** New persistent opioid use is more common than previously reported and can be considered one of the most common complications after elective surgery.

Brummett CM, et al. *JAMA Surg* 2017
Figure 2. Flow Diagram

88543 Opioid-naive patients

33184 Patients ≥65 y excluded

55359 Opioid-naive patients aged 18-64 y

19182 Excluded

12680 Did not fill an opioid prescription within 30 d before procedure to 14 d after discharge

6467 Had sequential anesthesia postoperatively

35 Whose length of stay was >30 d

36177 Patients included in analysis
Q3: How can optimal analgesia be achieved while minimizing opioid use in the perioperative period?

**Statement:** Optimal analgesia after surgery is achieved through a *planned multimodal analgesia approach* minimizing opioid use during *all phases* of perioperative care.
TREATMENT ALGORITHM FOR ACHIEVING OPTIMAL ANALGESIA AFTER SURGERY

**Mandatory**

**GENERAL PRINCIPLES**
- Setting realistic expectations and educating about the process to achieve optimal analgesia

**INTRAOP**
- Reinforcing expectations and goals; Continuing education about the process to achieve optimal analgesia for functional recovery [MUST engage all team members with a unified message]

**IV/ORAL ANALGESIA**
- NSAIDs
- ACETAMINOPHEN
- GABAPENTINOIDS
- SINGLE-SHOT: TAP, RS, SAB+/-OPIOID
- CONTINUOUS BLOCK: THORACIC EPIDURAL*, TAP/RS with/without CATHETER [REMOVE SHORTLY AFTER BOWEL FUNCTIONING]
- LIDOCAINE INFUSION
- DEXAMETHASONE
- KETAMINE BOLUS/INFUSION
- TRAMADOL

**OTHER ADJUNCTS**
- DEXAMETHASONE
- KETAMINE BOLUS/INFUSION
- TRAMADOL

**Rescue**
- SEE ‘RESCUE PLAN FOR SUBOPTIMAL ANALGESIA’

TREATMENT ALGORITHM FOR ACHIEVING OPTIMAL ANALGESIA AFTER SURGERY

CRITICAL FOR SUCCESS

- 30-50% ↓ in opioid use (OU) – scheduled combo
- ~30% ↓ OU; *DOSE-DEP*
- TAP ↓ pain > wound
- TEC for open
- ↓ OU; ↓ time ROBF?; Shorten LOS
- ↓ pain, ↓ OU, less rescue; 0.1 mg/kg IV
- ↓ pain?, ↓ OU; *DOSE-DEP*

adjunct; Sch IV;
*caution*: elderly, frail, SSRI/SNRI/MAOI

Keep calm and make a plan.

TREATMENT ALGORITHM FOR ACHIEVING OPTIMAL ANALGESIA AFTER SURGERY

GENERAL PRINCIPLES

PREOP CLINIC (DAY OF SURGERY)

INTRAOP PACU & POSTOP WARD

HOME

Setting realistic expectations and educating about the process to achieve optimal analgesia

Reinforcing expectations and goals; Continuing education about the process to achieve optimal analgesia for functional recovery [MUST engage all team members with a unified message]

IV/ORAL ANALGESIA

NSAIDs

ACETAMINOPHEN

GABAPENTINOIDs

LOCAL ANESTHETIC

CONTINUOUS BLOCK: THORACIC EPIDURAL*, TAP/RS with/without CATHETER

[S*REMOVE SHORTLY AFTER BOWEL FUNCTIONING]

SINGLE-SHOT: TAP, RS, SAB+/-OPIOID

LIDOCAINE INFUSION

OTHER ADJUNCTS

DEXAMETHASONE

KETAMINE BOLUS/INFUSION

TRAMADOL

Rescue Plan for Suboptimal Analgesia

**STEP 1:** Perform Focused H&P
- Preoperative analgesia use
- Preoperative pain baseline
- Postoperative exam
  - Determine location & etiology of pain

**STEP 2:** Assess Pain SEVERITY
- Assess location, severity, duration, & aggravating factors
- Limitations due to pain? (i.e. drinking, eating, mobilizing, sleeping)
- Any adverse drug events due to current pain regimen?

**STEP 3:** Determine Pain TYPE
- Determine the pain type: neuropathic, inflammatory, visceral, or somatic in nature?
- Consider the combination of multiple pain generators
  [EXCLUDE surgical/medical complications prior to treating]

**STEP 4:** Administer Rescue TREATMENT
- Confirm use of all appropriate non-opioid options from Treatment Algorithm, including tramadol.*
- Add opioid. PO if tolerated, IV if needed
  [e.g. hydrocodone, oxycodone, morphine, hydromorphone]
Q4: How does pain vary based upon the surgical approach in colorectal surgery?

Statement: The degree of pain after CRS will vary based upon the surgical approach and planned analgesic solutions will take this into account.
EDITORIAL

Precision Medicine Versus Procrustean Beds

Darin Correll, MD,*† and Angela Bader, MD, MPH*†‡

Anesthesia & Analgesia, April 2017
One Practical Approach

- One-stop preoperative clinic
- Extensive preoperative counseling & information
- Shortened (2 hr) fluid fasts
- Regular antiemetics, prokinetics & laxatives
- Emergency Bariatric contact mobile & written discharge information sheets
- Hourly incentive spirometry postoperatively
- Mobilisation 4 hrs postoperatively
- Strict protocol-based medical & nursing care
- Avoidance of long acting opiate analgesia
- Avoidance of fluid overload
DANGER

THIS OBJECT DOES
NOT HAVE A BRAIN
WE SUGGEST YOU
USE YOUR OWN
Colorectal ERAS Perioperative Components

Preoperative Timeline

- GABA
- APAP
  - Take on ride to hospital
- TEC or TAP depending on incision

Intraoperative Components

Non-opioid Maximal Analgesia
- Lidocaine infusion
- Ketamine infusion
- Ketorolac IV
- Run TEC if present

Postoperative Components

- 24h Lido infusion
- Scheduled GABA
- APAP
- NSAID
- Non-opioid Maximal Analgesia
- PCA (Rescue PRN opioids #1 PO; #2 IV)
A perioperative consult service results in reduction in cost and length of stay for colorectal surgical patients: evidence from a healthcare redesign project

Matthew D. McEvoy¹*, Jonathan P. Wanderer¹,², Adam B. King¹, Timothy M. Geiger³, Vikram Tiwari¹,², Maxim Terekhov¹, Jesse M. Ehrenfeld¹,²,⁴,⁵, William R. Furman¹,⁴, Lorri A. Lee¹,⁶ and Warren S. Sandberg¹,²,⁴
Effect of Implementing ERAS Pathway and Perioperative Consult Team on Length of Stay

Data as Median ± 95CI

*P<0.01 v. Phase 0

Preop and Intraop ERAS Bundle Components for Multimodal Analgesia Before and After Implementation of the ERAS Pathway for Colorectal Patients

Percentage (%) of Patients Receiving Component

Data as % of group receiving bundle component; *P<0.01 v. Baseline, #P<0.01 v. Phase 1

McEvoy et al. Perioperative Medicine, 2016;5:3
Intraoperative and PACU Opioid Use by Phase

Data as Mean ± 95CI  *P<0.0001 v. Phase 0

Use of Postoperative ERAS Bundle Components for Multimodal Analgesia Before and After Implementation of the ERAS Pathway for Colorectal Patients

Data as % of group receiving bundle component; *P<0.01 v. Phase 0, #P<0.05 v. Phase 0

McEvoy et al. Perioperative Medicine, 2016;5:3
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<tr>
<th>Perioperative Period</th>
<th>Components</th>
<th>Adjustments/Notes</th>
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| Preoperative         | Gabapentin: 300-600 mg PO >1 hour before OR time | - Reduce to 300 mg PO in patients >65y  
- Consider not giving or reducing to 100 mg PO in patients >75y  
- Consider dose reduction in patients with OSA |
|                      | Acetaminophen: 1000 mg PO >1 hour before OR time | - Reduce to 650 mg PO if <70kg  
- Don’t use if h/o significant liver disease |
|                      | Bilateral TAP Blocks ± rectus sheath blocks OR thoracic epidural catheter | TAP - ropiv 0.25% + dex 4mg (25-30mL/side)  
Rectus sheath - ropiv 0.25% + dex 2 mg (10-12mL/side) [add rectus sheath blocks if any portion of incision [e.g. periumbilical handport] or large ports above umbilicus]  
Thoracic epidural used for midline incision extending from above T8 to below umbilicus [use during intraoperative period] |

**Gabapentin:**  
300-600 mg PO >1 hour before OR time  
- Reduce to 300 mg PO in patients >65y  
- Consider not giving or reducing to 100 mg PO in patients >75y  
- Consider dose reduction in OSA patients

**Ketorolac:**  
30 mg IV at fascia closure  
- Reduce to 15 mg IV Q6h in patients >65y, CrCl<30, or weight <50kg  
- Hold if evidence of acute kidney injury

**Methadone:**  
Consider methadone 10-20 mg IV  
- If opioids required, consider methadone on emergence or in PACU (5 mg IV boluses) q5-10 min prior to using other opioids.

**Ketorolac:**  
30mg IV q6h x 3 days  
- Reduce to 15 mg IV Q6h in patients >65y, CrCl<30, or weight <50kg  
- Hold if evidence of acute kidney injury

**Postoperative**  
Acetaminophen: 1000 mg PO Q8hr starting DOS until discharge  
- Post-discharge: 500-1000mg PO Q8h x 3 days and then PRN

**Lidocaine**  
Continued from PACU or after thoracic epidural catheter removed  
Order for PACU to continue 24h: 1 mg/min IV if <70 kg; 1.5 mg/min IV if 70-100 kg; 2 mg/min IV >100 kg.  
- Contraindications as above  
- Reduce to 15 mg IV Q6h in patients >65y, CrCl<30, or weight <50kg  
- Hold if evidence of acute kidney injury

**Ketorolac:**  
30mg IV q6h x 3 days

**Opioids:** as needed (PRN)  
Example: Oxycodone 5mg PO Q4 PRN pain >4/10; consider opioid PCA or PRN bolus for breakthrough pain, but not a standard order.  
- Post-discharge: short course of short-acting opioid (e.g. oxycodone 5mg q6h PRN x 3days) unless chronic pain/opioid use concerns to address.  
- Post-discharge: short course of short-acting opioid (e.g. oxycodone 5mg q6h PRN x 3days) unless chronic pain/opioid use concerns to address.  
- If used, continue with local anesthetic (e.g. bupivacaine 0.1%) +/- opioid if needed for denser quality block (e.g. hydromorphone 10mcg/mL)

**Thoracic Epidural**
Take Home Points

• Analgesia is a key component in ERPs.
• Optimal analgesia addresses patient pain while restoring function and minimizing side effects.
• Minimizing opioid use is a cornerstone of practice within ERPs.
• Different surgical approaches need different strategies.
• Many different combinations are efficacious.
• Hospitals should adopt at least 2 or 3 analgesic strategies for ERPs to allow for individual patient variation, as well as a structured rescue plan.
• Audit of compliance of analgesia and restoration of function can lead to improvement of patient experience.
Vanderbilt Department of Anesthesiology
Uncompromising quality in clinical care, research and education.

CIPHER
Center for Innovation in Perioperative Health, Education, and Research
Leading Change in Perioperative Care
The Latest Literature


Wanderer JP, Naveen N. Anesth & Analg, 2017;125:1427
VUMC Opioid Use Over Time

MIRROR, MIRROR ON THE WALL
Our Data: LOS and Intraop Opioid Use
“It was discovered that a maximum daily dose that exceeds 2mg of IV hydromorphone equivalents was most predictive of POI.”