Multimodal Postoperative Pain Management: The Evidence

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A Multimodal Approach Uses a Variety of Therapeutics to Minimize Opioid Use and ORAEs

Simultaneous use of a ≥2 modalities that act at different sites within the central and peripheral nervous systems in an effort to:

- Reduce pain
- Minimize opioid use and ORAEs

- Nonpharmacologic interventions
- Interventional techniques
- Non-opioids
- Adjuvant/Co-analgesic
- Opioids

ORAE, opioid-related adverse event; NSAID, nonsteroidal anti-inflammatory drug; NMDA, N-methyl-D-aspartate; COX, cyclooxygenase.
Guidelines for the Management of Postoperative Pain

Management of Postoperative Pain: A Clinical Practice Guideline From the American Pain Society, the American Society of Regional Anesthesia and Pain Medicine, and the American Society of Anesthesiologists' Committee on Regional Anesthesia, Executive Committee, and Administrative Council

23 Expert panel members completed systematic review of evidence re:
- Preoperative education
- Perioperative pain management planning
- Use of different pharm and nonpharm modalities
- Organizational policies
- Transition to outpatient care

Identified many research gaps

Evidence supports the use of multimodal regimens that vary depending on patient, setting, and surgical procedure

32 Recommendations
- Of the 24 strong recommendations only 4 were supported by high-quality evidence
1, 2) Patient education

Provide patient and family-centered, individually tailored education to the patient (and/or responsible caregiver), that is developmentally-appropriate including information on treatment options for management of postoperative pain.

For patients with more intensive needs (e.g., due to medical or psychological comorbidities or social factors):
- Reduced post-op opioid use
- Reduced pre-op anxiety
- Fewer requests for sedatives
- Reduced LOS post op

Recommended teaching:
- Continued & held meds
- When to report pain
- How pain is assessed
- Use of non-opioids, multi-modal approach
- Risk of addiction to opioids

**strong** recommendation, low-quality evidence
3) Pre-operative evaluation

Conduct a pre-operative evaluation to guide the perioperative pain management plan

- assessment of medical and psychiatric comorbidities
- previous postoperative treatment regimens and responses
- concomitant medications
- history of chronic pain
- substance abuse

**strong** recommendation, low-quality evidence
4) Adjust plan based on pain relief & AEs

Adjust the pain management plan on the basis of adequacy of pain relief and presence of adverse events

- Monitor for quality of pain relief
- Monitor for progress toward functional goals
- Monitor of side effects
  - Nausea
  - Constipation
  - Excess sedation
- EtCO$_2$ monitor

*strong* recommendation, low-quality evidence
5) Choose a validated pain scale

Use a validated pain assessment tool to track responses to postoperative pain treatments and adjust treatment plans accordingly.

- Numeric rating scales
- Verbal rating scales
- Faces scales

**strong** recommendation, low-quality evidence
6) Multimodal analgesia

Offer multi-modal analgesia, or the use of a variety of analgesic medications and techniques combined with non-pharmacological interventions, for the treatment of postoperative pain in children and adults.

- Nonpharm
- Non-opioids
- Peripheral & neuraxial opioids
- Systemic opioids if needed

- Superior pain relief
- Decreased opioid consumption

**strong recommendation, high-quality evidence**
Panel recommends that clinicians consider transcutaneous electrical nerve stimulation (TENS) as an adjunct to other postoperative pain treatments.

- Systematic review found use of TENS associated with approximately 25% less postoperative analgesic use compared to no TENS.
- Effective when applied near surgical incision area and acupoints away from the incision.
8) Acupuncture, massage, or cold therapy

Panel can neither recommend nor discourage acupuncture, massage, or cold therapy as adjuncts to other postoperative pain treatments.

- Although these therapies are generally considered to be safe, evidence on their effectiveness as adjunctive therapies as part of a multimodal approach to perioperative pain management varies substantially.
9) Use of cognitive-behavioral modalities (CBM) in adults

Recommends that clinicians consider the use of cognitive-behavioral modalities in adults as part of a multimodal approach.

- Most studies of CBM showed some positive effects on postoperative pain, analgesic use, or anxiety, with inconsistent or unclear effects on LOS.
- Ex: guided imagery, relaxation, hypnosis, intraoperative suggestions, music

Weak recommendation, moderate-quality evidence
10) Prioritize oral opioids

Recommends oral over intravenous administration of opioids for postoperative analgesia in patients who can use the oral route

- Most evidence IV opioids not superior to oral
- Post op pain often continuous 1\textsuperscript{st} 24 hours, but long-acting not recommended
- Pre-op opioids not beneficial
- Continue scheduled opioids pre-op

\textbf{strong} recommendation, moderate-quality evidence
11) Avoid using IM route

The use of Intramuscular route for the administration of analgesics is discouraged

- can cause significant pain
- has unreliable absorption
- provides inconsistent analgesia
- has no advantage over any other route

**strong** recommendation, moderate-quality evidence
12) Use PCA if IV needed

Patient-controlled analgesia (PCA) be used for postoperative systemic analgesia when the parenteral route is needed

- Use of IV > few hours anticipated
- Patients unable to tolerate PO
- Adequate cognition
- Avoid proxy administration
- Bolus may be appropriate immediate post op if more severe pain present

**strong** recommendation, moderate-quality evidence
13) Avoid basal/continuous infusion if patient is opioid-naive

Recommends against routine basal infusion of opioids with IV PCA in opioid-naive adults

- Most studies: no improvement over PCA
- Increased nausea
- Some risk of over sedation

**strong recommendation, low-quality evidence**
15) Use acetaminophen &/or NSAIDs

Provide adults and children with acetaminophen and/or NSAIDs as part of multimodal analgesia for management of postoperative pain in patients without contraindications

- Most studies show less post op pain
- Less opioid consumption
- Acetaminophen + NSAID more effective than either drug alone
- Little difference between IV vs PO admin
- NSAIDs: increase GI bleed, CV, renal AEs.
- NSAIDs: possible non-union ortho & spinal fusion, colorectal increased anastomotic leakage, insufficient evidence to recommend against use
- NSAIDS not rec for coronary art. grafts

**strong recommendation, high-quality evidence**
16) Preoperative dose of celecoxib

Recommends use of preoperative celecoxib in patients who undergo major surgery

- Reduces opioid requirements after surgery
- Lower postoperative pain scores
- Most common dose in trials 200-400 mg, 30-60 min prior to surgery

*strong* recommendation, moderate-quality evidence
17) Use gabapentin or pregabalin

Consider use of gabapentin or pregabalin as a component of multimodal analgesia

• Associated with reduced post op opioid use
• May reduce post op pain
• Pre-op dose effective (1-2 hr pre-op, Gabapentin 600-1200, Pregabalin 150-300)
• For major surgery or those associated with substantial pain
• For highly-opioid tolerant patients

**strong** recommendation, moderate-quality evidence
18) IV Ketamine

Consider use of IV ketamine as a component of multimodal analgesia in adults

- Associated with reduced post op pain medication use
- Decreased postoperative pain scores
- Decreased risk of persistent postoperative pain
- Many varying doses and administration times studied – panel suggests:
  - Preop bolus of 0.5 mg/kg followed by,
  - infusion at 10mcg/kg/min intraop
  - With or without postop infusion at a lower dosage
- Reserved form major surgeries
19) IV lidocaine infusions

Consider use of IV lidocaine infusions in adults who undergo open and laparoscopic abdominal surgery without complications

• Associated with shorter duration of ileus
• Better quality of analgesia

[Weak recommendation, moderate-quality evidence]
20) Use of surgical site-specific local anesthetic infiltration for surgical procedures

Use of subcutaneous and/or intraarticular infiltration of long-acting local anesthetics at the surgical site has been shown to be effective as a component of multimodal analgesia for several surgical procedures.

- TKA
- Cesarean section
- Laparotomy
- Hemorrhoid surgery

weak recommendation, moderate-quality evidence
21) Use of topical local anesthetics in combination with nerve blocks before circumcision

For circumcision, evidence indicates effectiveness of topical anesthetics in combination with penile nerve block

**strong** recommendation, moderate-quality evidence
22) Panel *does not* recommend intrapleural analgesia with local anesthetics for pain control after thoracic surgery.

Not associated with clear beneficial effects on postoperative pain.

- Associated with high potential for toxicity.
23) Use of surgical site-specific peripheral regional anesthetic techniques

Shown to be effective as a component of multimodal analgesia for a number of surgeries

- Thoracotomy
- Lower extremity joint surgery
- Shoulder surgery
- Cesarean section
- Hemorrhoid surgery
- Circumcision

*strong* recommendation, high-quality evidence
24) Use of continuous, local anesthetic-based peripheral regional analgesic techniques

When the need for analgesia is likely to exceed the duration of effect of a single injection

**strong** recommendation, moderate-quality evidence
25) Addition of clonidine

Consider the addition of clonidine as an adjuvant for prolongation of analgesia with a single-injection peripheral neural blockade

• Combination of adjuvant agents may prolong the duration of analgesia
• May reduce need for continuous infusion
• May increase risk of postoperative:
  • Hypotension
  • Sedation
  • Syncope

weak recommendation, moderate-quality evidence
26) Offer neuraxial analgesia for major thoracic and abdominal procedures

Epidural analgesia with local anesthetics (w/wo opioids) or spinal analgesia is associated with:

- Lower postoperative pain scores
- Decreased use of rescue analgesia
- May decrease risk of postoperative:
  - Mortality, VTE, MI, Pneumonia
  - Respiratory depression
  - Duration of ileus

Advantage of epidural is that it can be continuous or as PCA with local anesthetics, whereas spinal analgesia is limited to single dose opioids

**strong recommendation, high-quality evidence**
27) Avoid neuraxial administration of magnesium, benzodiazepines, neostigmine, tramadol, and ketamine

Evidence on the effectiveness of adjuvant medications administered using the epidural or spinal route with local anesthetics (w, w/o opioids) is limited.

- No clear benefit
- Insufficient evidence to determine safety
- Most are not available in a preservative-free formulation

**strong** recommendation, moderate-quality evidence
28) Provide appropriate monitoring for patients who have received neuraxial interventions

Neuraxial analgesia is associated with decreased perioperative mortality and pulmonary and cardiac complications compared with systemic opioids. Adverse effects including respiratory depression, hypotension and motor weakness can occur.

- Monitor for adverse effects
- Be prepared to treat

**Strong** recommendation, low-quality evidence
29) Develop policies and processes for safe and effective postoperative pain control

Facilities in which surgery is performed have an organizational structure in place to develop and refine policies and processes for safe and effective delivery of postoperative pain control

- Interdisciplinary
- Through QI, or pain management team
- Administrative & involved physician leadership
- Outcomes assessment driven

**strong** recommendation, low-quality evidence
30) Pain management consult

Facilities in which surgery is performed provide clinicians with access to consultation with a pain specialist for patients with inadequately controlled postoperative pain or at high risk of inadequately controlled postoperative pain (eg, opioid-tolerant, history of substance abuse)

- Interdisciplinary approach
- Pharmacologic and nonpharmacologic approaches

**strong recommendation, low-quality evidence**
31) Have policies and procedures in place to support safe delivery of advanced procedures

Recommends facilities in which neuraxial analgesia and continuous peripheral blocks are performed have policies and procedures to support their safe delivery and trained individuals to manage these procedures

- Providers have commensurate education, training and oversight, and experience to assure safe and effective therapy.
- Appropriate monitoring is available
- Competency based training and education for all staff

*strong recommendation, low-quality evidence*
32) Educate patients on discharge pain management plan

Provide education to all patients (adult and children) and primary caregivers on the pain treatment plan including tapering of analgesics after hospital discharge

- How to take meds safely
- How to manage side effects
- Avoidance of alcohol & CNS depressants
- Include plan for reduction (typically reduce 20-25% q day or 2)
- Discuss with chronic opioid users taper to target maintenance dose

**strong recommendation, low-quality evidence**
Thank You