



UNIVERSITY OF CENTRAL FLORIDA

To Opiate or Not? That is the Question!

**Application of a Multi-Modal Approach to Pain Management of the
Post-Operative Patient**

2017 Post-Anesthesia Care Unit Manager Summit

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Conflict of Interest Disclosure

- Dr. Blackwell is an endorsed, branded speaker for Mallinckrodt Pharmaceuticals, specifically for intravenous injectable acetaminophen (Ofirmev®).
 - This product will be mentioned during this presentation.
 - This product will *not* be promoted during this presentation whatsoever.

Introduction

- Post-operative pain management remains a major clinical challenge for nurses, physicians, and other clinicians practicing in the peri-surgical environment.
- Because pain management satisfaction is directly tied to reimbursement (eg. HCAPS), appropriate pain management in acute care settings is crucial.



Introduction

- Patients report pain as a major post-operative issue
- Data suggest more work is needed to improve management of pain in this population
 - Inadequate analgesia delays patient discharge and results in extended convalescence in the recovery room.
 - In the ambulatory setting, poor pain relief leads to:
 - Callbacks to the surgery centers and involvement of the patient's medical staff including physicians, surgeons, nurses, etc.
 - Possibility of emergency room evaluation
 - Hospital readmission.

Introduction

- The American Pain Society, American Society of Anesthesiologists, the US Department of Veterans Health Administration, and Department of Defense formed expert panel to perform exhaustive review of the evidence and develop new clinical practice guidelines for postoperative pain management.
 - The formal recommendation was to manage post-operative pain using a multimodal approach.

the
multimodal
approach

Pathophysiologic and Pharmacologic Implications

- **Transduction**, in which activated nociceptors (the free nerve endings of primary afferent neurons that sense noxious stimuli) release an electric signal, may be disrupted by NSAIDs [eg ketorlac (Toradol®)] and membrane stabilizing agents, such as gabapentinoids (eg. gabapentin [Neurontin®]).
- **Transmission**, in which the electric signal moves from the site of injury to the spinal cord and brain, may be interrupted by local anesthetics and gabapentinoids (eg. gabapentin [Neurontin®]).

Pathophysiologic and Pharmacologic Implications

- **Perception**, the awareness of pain in the somatosensory cortex of the brain, may be moderated by systemic opioids (eg. fentanyl (Sublimaze®) and NMDA receptor antagonists (eg. memantine [Nemanda®]).
- **Descending and local modulation**, the adaptive processes through which pain impulses may be enhanced or diminished either centrally (by descending pathways that originate in the brain and project to the spinal cord) or in the periphery, are responsive to such interventions as neuraxial therapy, peripheral nerve blocks, and local infiltration analgesia.

Pathophysiologic and Pharmacologic Implications

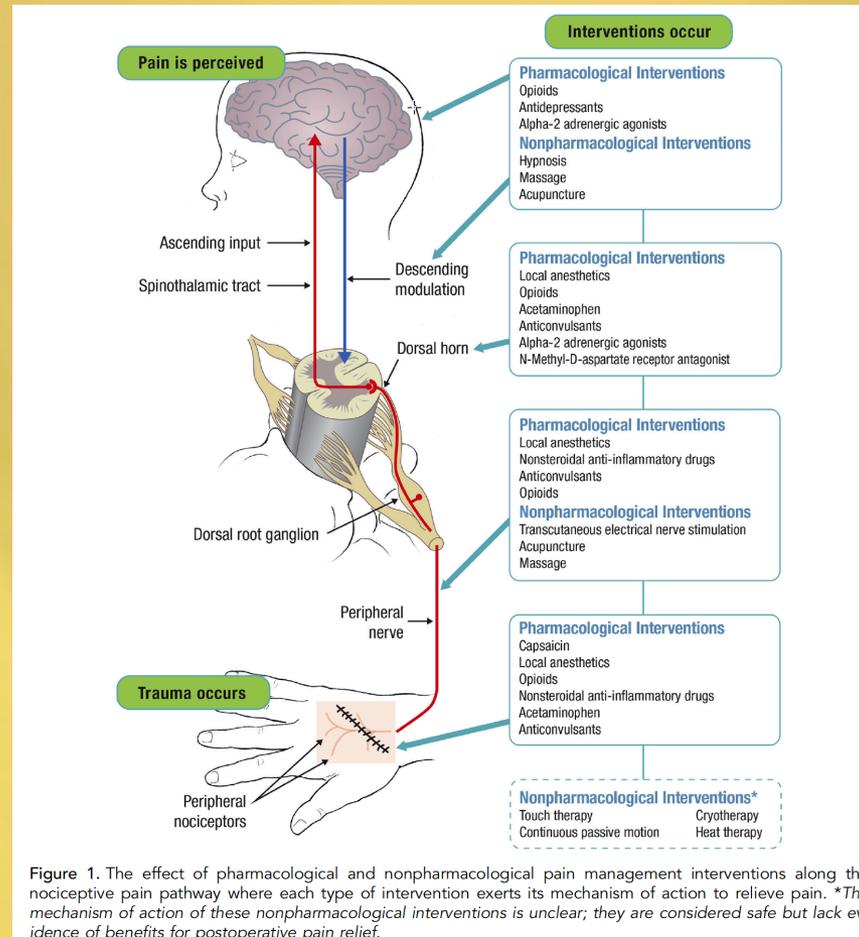


Figure 1. The effect of pharmacological and nonpharmacological pain management interventions along the nociceptive pain pathway where each type of intervention exerts its mechanism of action to relieve pain. *The mechanism of action of these nonpharmacological interventions is unclear; they are considered safe but lack evidence of benefits for postoperative pain relief.

Manworren, R.C.B. (2015). Multimodal pain management and the future of a personalized medicine approach to pain. *AORN Journal* 101, 308-314. doi: <http://dx.doi.org/10.1016/j.aorn.2014.12.009>.

Pathophysiologic and Pharmacologic Implications

- Traditional Agents:
 - Local anesthetic agents block conduction of nerve impulses by decreasing or preventing an increase in the permeability of excitable membranes to sodium either at the site of injury (eg, wound site) or centrally (eg, IV, nerve block, epidural).
 - Acetaminophen (Tylenol®/Ofirmev®) inhibits prostaglandin synthesis in the central nervous system and has a weak anti-inflammatory activity in the peripheral nervous system.
 - Nonsteroidal anti-inflammatory drugs (ibuprofen [Motrin®]) inhibit prostaglandin production by blocking cyclooxygenase both peripherally and centrally.

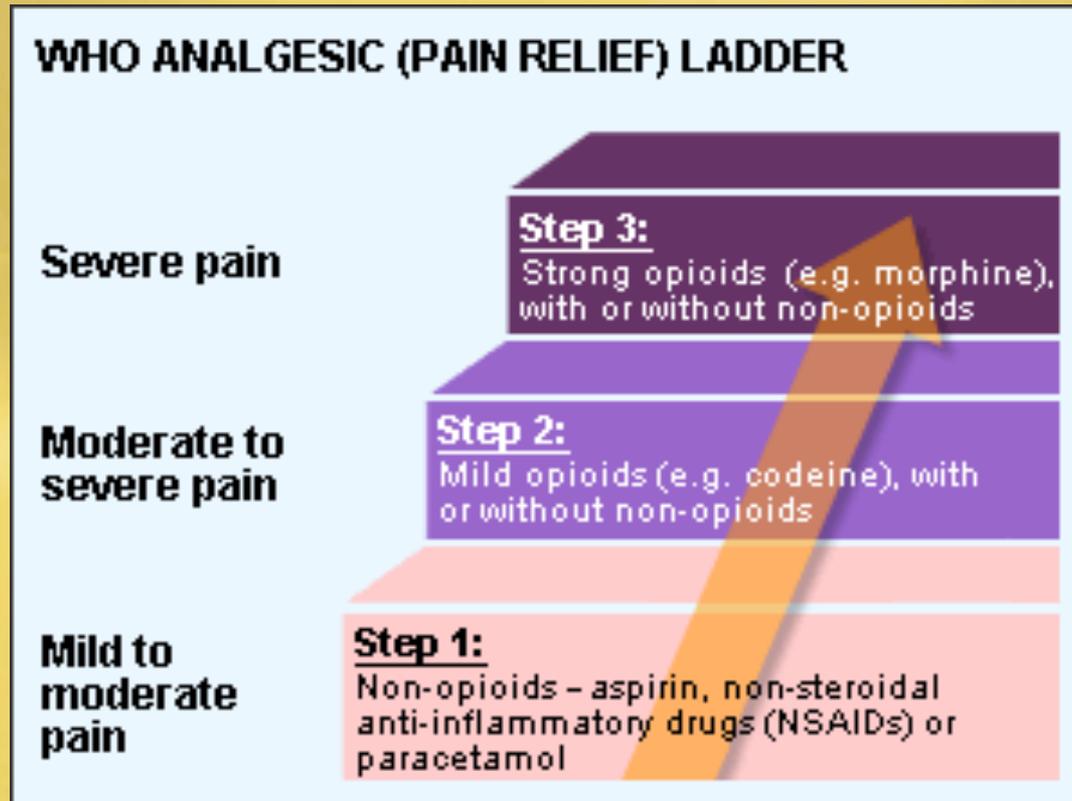
Pathophysiologic and Pharmacologic Implications

- Traditional Agents:
 - Opioids have multiple sites of action.
 - In the brain, opioids activate descending pain inhibitors.
 - In the periphery, they work by reducing the release of inflammatory products.
 - In the spine, opioids decrease:
 - presynaptic calcium and sodium influx
 - production and release of excitatory amino acids, such as substance P
 - Postsynaptic excitability.

SUBSTANCE-P

Multi-Modal Interventions

- World Health Organization (WHO) Pain Management Ladder



Multi-Modal Interventions

- Offer multimodal analgesia (ie, use of a variety of analgesic medications and nonpharmacological interventions [eg, transcutaneous electrical stimulation, cognitive behavioral therapies]) for the treatment of perioperative pain in adults and children.
 - **[Strong Recommendation, High-Quality Evidence]**
- Adjust postoperative pain management plan based on the adequacy of pain relief and occurrence of adverse events
 - **[Strong Recommendation, Low-Quality Evidence]**

Multi-Modal Interventions

- As a component of a multimodal analgesia plan for postoperative pain management:
 - Consider the use of a preoperative dose of oral celecoxib (Celebrex®) in adult patients who do not have contraindications.
 - **[Strong Recommendation, Moderate-Quality Evidence]**
 - Provide adults and children with acetaminophen and/or nonsteroidal anti-inflammatory drugs (NSAIDs) in patients without contraindications to these medications
 - **[Strong Recommendation, High-Quality Evidence]**

Multi-Modal Interventions

- As a component of a multimodal analgesia plan for postoperative pain management:
 - Consider the use of oral gabapentin (Neurontin®) or pregabalin (Lyrica®).
 - **[Strong Recommendation, Moderate-Quality Evidence]**
 - Consider providing adults with IV ketamine.
 - **[Weak Recommendation, Moderate-Quality Evidence]**
 - Consider providing adults undergoing open and laparoscopic abdominal surgery with IV lidocaine infusions.
 - **[Weak Recommendation, Moderate-Quality Evidence]**

Multi-Modal Interventions

- As a component of a multimodal analgesia plan for postoperative pain management:
 - Consider the use of transcutaneous electrical nerve stimulation.
 - **[Weak Recommendation, Moderate-Quality Evidence]**
 - Consider the use of cognitive modalities as part of a multimodal approach.
 - **[Weak Recommendation, Moderate-Quality Evidence]**



EVIDENCE

Multi-Modal Interventions

- For those surgical procedures with evidence indicating efficacy
 - Consider surgical site-specific local anesthetic infiltration.
 - **[Weak Recommendation, Moderate-Quality Evidence]**
 - Consider surgical site-specific peripheral regional anesthetic techniques.
 - **[Strong Recommendation, High-Quality Evidence]**
 - Use 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, Low-Quality Evidence]**

Multi-Modal Interventions

- For those surgical procedures with evidence indicating efficacy
 - Offer neuraxial analgesia with opioids and/or local anesthetics for major thoracic and abdominal procedures, particularly in patients at risk for prolonged ileus or cardiac or pulmonary complications.
 - **[Strong Recommendation, High-Quality Evidence]**
 - Consider the addition of clonidine as an adjuvant to single-injection peripheral neural blockade to prolong the analgesic effect
 - **[Weak Recommendation, Moderate-Quality Evidence]**



Multi-Modal Interventions

- Use topical local anesthetics in combination with nerve blocks before neonatal male circumcision.
 - **[Strong Recommendation, Moderate-Quality Evidence]**
- Provide appropriate monitoring of patients who are receiving systemic opioids for postoperative analgesia
 - **[Strong Recommendation, Low-Quality Evidence]** or
- receiving neuraxial interventions.
 - [Strong Recommendation, Weak-Quality Evidence]**

Multi-Modal Interventions

- Use IV patient-controlled analgesia (PCA) when the parenteral route is needed.
 - **[Strong Recommendation, Moderate-Quality Evidence]**
- However, do not use a routine basal (ie, continuous, background) infusion of opioids with IV PCA in opioid-naïve adults.
 - **[Strong Recommendation, Moderate-Quality Evidence]**



Multi-Modal Interventions

- Avoid the use of the intramuscular (IM) route for the administration of analgesics.
 - **[Strong Recommendation, Moderate-Quality Evidence]**
- Avoid the neuraxial administration of magnesium, benzodiazepines, neostigmine, tramadol, and ketamine.
 - **[Strong Recommendation, Moderate-Quality Evidence]**

Multi-Modal Interventions

- Acupuncture, massage, or cold therapy are neither recommended nor discouraged as adjuncts to other postoperative pain treatments.
 - **[Insufficient Evidence]**
- Intrapleural analgesia with local anesthetics for pain control is not recommended after thoracic surgery.
 - **[Strong Recommendation, Moderate-Quality Evidence]**



Assessment of the Evidence

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Table 1. Evidence-Based Guidelines for Managing Acute Pain

Authors/Professional Organization	Title	Major Recommendations	Recommendations Relevant to Multimodal Analgesia
American Society of Anesthesiologists Task Force on Acute Pain Management ¹⁴	Practice guidelines for acute pain management in the perioperative setting	<ul style="list-style-type: none"> • Institutional policies and procedures for perioperative pain management must 1) prioritize continued pain education for providers, 2) utilize validated pain assessment instrumentation, and 3) promote around-the-clock pain consultations. • Take a preoperative, directed pain history on all patients. • Engage patients and families in preoperative pain management education. • Implement perioperative pain management techniques based on provider expertise and a discussion with the patient about risks and benefits. • Implement safe multimodal pain management. • Take extra precautions when managing pain in pediatric, geriatric, critically ill, and cognitively or communicatively impaired populations. 	<ul style="list-style-type: none"> • When possible, implement multimodal pain management therapy in treatment across patient populations and procedures. • Unless contraindicated, deliver a continuous regimen of NSAIDs, selective COX-2 inhibitors, or acetaminophen to patients in acute pain. • Consider regional blockade to deliver multimodal local anesthetics in managing pain. • At all times, optimize dosing efficacy while minimizing the risk of adverse events. • Individualize medication, dose, route, and duration of pain management.
Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine ⁵⁹	Acute pain management: scientific evidence	<ul style="list-style-type: none"> • Provide continuous management of acute pain to prevent its transition to chronic pain, which has adverse effects on health outcomes. • Use patient self-reports of pain in conjunction with appropriate validated measures to assess the multiple dimensions of pain. • Optimal pain management requires patient education and health care team collaboration. • PCA is not appropriate for the delivery of all analgesics. • The patient's analgesia needs must be met prior to starting PCA. • Use nonpharmacologic techniques that have been proven safe and effective. • Certain populations, including children; patients with renal or hepatic impairment, opioid tolerance, addiction or substance use disorders, or sleep apnea; culturally or linguistically diverse populations; older adults; and pregnant women, require special assessment and pain management. 	<ul style="list-style-type: none"> • Compared with mainly opioid-based analgesia, multimodal analgesia improves pain while reducing opioid consumption. • Burn injuries require aggressive multimodal analgesia and multidisciplinary treatment. • The patient's multifaceted pain experience requires individual management using diverse analgesics and routes of administration that all require evaluation and consideration of risks.

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Assessment of the Evidence

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Table 1. Continued

<p>Washington State Agency Medical Directors' Group⁶⁰</p>	<p>Interagency guideline on prescribing opioids for pain</p>	<ul style="list-style-type: none"> • Regularly evaluate clinically meaningful improvement in function related to pain in all patients, using validated tools and measures. • In addition to medications, pain therapies should include physical and behavioral health interventions. • Reserve opioids, prescribed at the lowest necessary dose, for acute pain resulting from severe injuries or medical conditions, surgical procedures, or when nonopioid options are ineffective or contraindicated. • Exercise caution when prescribing opioid analgesic therapy for patients with chronic noncancer pain and provide ongoing assessment to identify adverse outcomes. • At times, reducing or discontinuing chronic opioid analgesic therapy is necessary—especially when risk from continued treatment outweighs the benefit. • Assess patients for opioid use disorder in accordance with DSM-5 criteria. • Consider providing opioid-sparing analgesics as well as alternative treatments and behavioral therapies for pain control. • Precautions must be taken when managing chronic pain in special populations (children, pregnant women, older adults, or cancer survivors). 	<ul style="list-style-type: none"> • Multimodal analgesics are most effective in controlling pain and in minimizing analgesic doses and their resultant adverse effects, which interfere with rehabilitation. • Set expectations with patients and family members about realistic pain management goals that include the potential need for multimodal treatment. • During the intraoperative period provide balanced multimodal analgesia. • Ketamine, lidocaine, and regional local anesthetic techniques may help minimize perioperative opioids and their adverse effects. • Use the lowest possible dose of opioid therapy as part of a multimodal regimen that includes NSAIDs, acetaminophen, and nonpharmacologic therapies, unless contraindicated.
<p>American Pain Society; American Society of Regional Anesthesia and Pain Medicine; American Society of Anesthesiologists Committee on Regional Anesthesia¹</p>	<p>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</p>	<ul style="list-style-type: none"> • Preoperative education and pain management planning should be patient- and family-centered, and tailored to patient medical, psychological, or social needs. • Use validated pain assessment tools to track response to pain treatment and make appropriate adjustments. • Patients across the life span should receive multimodal analgesia that includes nonpharmacologic interventions. • Both physical modalities, such as TENS or acupuncture, and cognitive-behavioral approaches should be part of the pain management plan. • Organizational structure, policies, and procedures should provide clinicians with access to consultation with a pain specialist for patients with inadequately controlled postoperative pain. When patients are transitioning to outpatient care, patients, families, and primary care providers should be educated on the pain management plan. 	<ul style="list-style-type: none"> • For procedures with evidence indicating efficacy, peripheral regional anesthesia should be implemented. • Use systemic pharmacologic therapies across medication classes and administrative routes while ensuring patient safety. • Offer and use multimodal analgesia—a variety of analgesic medications and techniques, combined with nonpharmacologic interventions—in the treatment of postoperative pain. • Be aware of the different adverse effect profiles of each medication and technique used in multimodal analgesia, so as to provide appropriate monitoring to identify and manage adverse effects.

COX = cyclooxygenase; DSM = Diagnostic and Statistical Manual of Mental Disorders; NSAID = nonsteroidal antiinflammatory drug; PCA = patient-controlled analgesia; TENS = transcutaneous electrical nerve stimulation.

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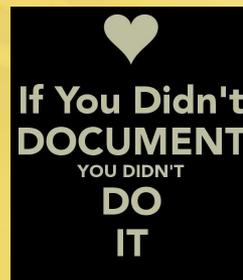
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Practice Implications Using the Multi-Modal Approach

- Patient education is an essential components of multimodal pain management.
 - Patients need to understand:
 - Rationale for their treatment and for the use of all medications and interventions both during and after hospitalization.
 - It is critical that patients receiving multimodal analgesia be provided both oral and written instructions:
 - Names of all pain medications.
 - How meds work, their basic MOA, and how they fit into their regimen
 - Dosages and dosing schedules.
 - Common and serious adverse effects.

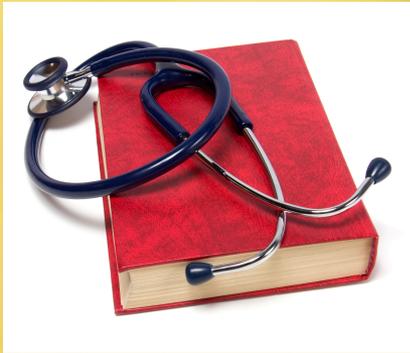
Practice Implications Using the Multi-Modal Approach

- Patients need to know that it's time to call a provider if pain relief is inadequate or if they experience any serious adverse events
- If taking opioids or agents that produce sedation, patients should be advised to avoid alcohol, operating machinery, and driving.
- Most important: DOCUMENT that this education has been completed and the patient and/or his/her loved ones acknowledged a complete understanding of these instructions.



Practice Implications Using the Multi-Modal Approach

- Nurses must be knowledgeable about various classes of analgesics, mechanisms of action in the peripheral and central nervous systems, routes of administration, recommended dosing, adverse effect profiles, drug-to-drug synergistic effects and interactions, and contraindications.
 - Emerging data are highlighting the significance of pharmacogenomics



Practice Implications Using the Multi-Modal Approach

- Nurses should familiarize themselves about research and evidence-based practice guidelines for specific types of pain.
 - Like all levels of nursing practice, assessment and proper interpretation and prioritization of assessment findings is crucial.
- The nurse should be astute and consider which patients are at greater risk for developing chronic postsurgical pain syndrome and adverse effects associated with the use of opiates.



Nursing Practice Using the Multi-Modal Approach

- Interdisciplinary collaboration with pain experts (anesthesiologists, pain management nurses, and pharmacists) is vital.
 - Ensuring nursing is included in the care planning of the post-operative patient is an integral component of this.

Nursing Practice Using the Multi-Modal Approach

- Nursing curricula, including advanced practice curricula, must include competency-based evaluations that emphasize multimodal analgesic approaches for acute pain management and clinical decision making in designing analgesic regimens and developing nursing plans of care.
- This includes APN curricula, based on specialty certification and educational preparation:
 - Pain management by the (FNP-BC/ANP-BC/APCNP-BC) in the primary care setting (even when managing recent post-operative pain) differs from that of the ACNP/AGACNP in the acute care setting.
- Competencies in delivering multimodal therapies and monitoring patients should be evaluated.

References

Please see the supplemental handout, which includes a bibliography and additional resources for more information.



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