



# Understanding the Pharmacology of Analgesics

*Part of the INROADS into Pain Management Series*

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# Welcome & Introduction

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# Learning Objectives



- **Review the pharmacology and therapeutic rationale for major classes of pain medications**
- **Discuss multimodal therapy as a means to enhance analgesia and reduce side effects**
- **Identify key factors for tailoring pain regimens based on a patient's individual health profile**
- **Explore appropriate uses of multimodal therapy through case-based learning**

# Agenda



- **Pursuing a More Mechanistic Approach to Analgesia: Multimodal Therapy**
  - Debra B. Gordon, RN-BC, MS, ACNS-BC, FAAN
- **Multimodal Management of Postoperative Pain in a High-risk Patient**
  - Chris Pasero, MS, RN-BC, FAAN
- **A Multimodal Approach to the Care of a Patient With Fibromyalgia**
  - Colleen J. Dunwoody, MS, RN-BC
- **Questions & Answers**
  - Moderated by Rosemary C. Polomano RN, PhD, FAAN

# Audience Response



- **What is your primary area of focus within pain management?**
  - 1. Acute**
  - 2. Chronic**
  - 3. Acute and chronic**

# Audience Response



- **What is your office setting?**
  1. **Education/university/research**
  2. **Family/general practice**
  3. **Hospital–PACU**
  4. **Hospital–other**
  5. **Long-term care facility or hospice**
  6. **Outpatient surgery center**
  7. **Pain clinic**



# Pursuing a More Mechanistic Approach to Analgesia: Multimodal Therapy

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# Individualizing Pain Therapy: Patient and Practice Factors



- **Optimizing analgesic therapy requires an individualized approach to each patient**
- **Treatment should be based on a comprehensive assessment of the patient's needs**
- **Issues involved in this process can be divided into 2 areas:**

<b>Patient Factors</b>	<b>Practice Factors</b>
<ul style="list-style-type: none"><li>• <b>General health status and predisposing risk factors</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Systematic assessment and monitoring</b></li></ul>
<ul style="list-style-type: none"><li>• <b>Pre-existing pain syndromes</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Implementation of protocols</b></li></ul>
<ul style="list-style-type: none"><li>• <b>Injury/surgery type</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Formulating initial pain plan</b></li></ul>
<ul style="list-style-type: none"><li>• <b>Medication history</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Reassessment and adjustment of pain plan</b></li></ul>



# Audience Response



- **When determining goals of pharmacologic therapy, it is important to:**
  - 1. Advocate for PRN range orders that ensure pain is <4/10**
  - 2. Individualize goals based on surgical protocols**
  - 3. Ensure that therapy includes a drug that both inhibits and excites pain processes**
  - 4. Balance analgesia and side effects**

# Individualizing Pain Therapy



- **Formulating a pain plan**
  - **Recognize each patient represents an individual therapeutic “experiment” that requires careful selection and titration of therapy<sup>1</sup>**
    - **Lack of predictable relationship between opioid dose and pain relief makes it inadvisable to prescribe predetermined dose based on pain intensity**
    - **Determine regimens based on drug pharmacokinetics, patient characteristics, and clinical situation**
  - **PRN orders should be specific but not absolute**
    - **Avoid explicit dosing recommendations that leave little room for clinical judgment based on patient response**
    - **Avoid vague or open-ended orders, such as “titrate to comfort”<sup>1</sup>**

# Pharmacologic Management of Pain: Goals



- **Produce clinically meaningful acute pain relief**
  - Data from clinical trials suggest that a 33% to 50% decrease in pain intensity is meaningful<sup>1</sup>
  - Severity of acute pain predicts chronic pain, although causal relationship is not fully established<sup>2</sup>
- **Achieve balanced analgesia that maximizes pain relief while minimizing side effects**
  - Enhance consistency/reduce analgesic gaps
  - Avoid unnecessary sedation
  - Mitigate serious risks
  - Reduce effects that impair patient comfort/compliance
- **Individualize treatment based on each patient's current response and past medical history<sup>3</sup>**
  - Avoid dosing to a specific pain rating number

1. Farrar JT. *J Pain Symptom Management*. 2003;25:406-411.

2. Macrae WA. *Br J Anaesth*. 2001;87:88-98

3. Gordon DB, et al. *Arch Intern Med*. 2005;165:1574-1580.

# Physiology of Pain: Neurochemical Mediators



- A large number of neurotransmitters and other chemical mediators play a role in pain processing and modulation
- Mediators act in a complex and interrelated process

<b>Excitatory</b> (promote or intensify the pain process)	<b>Inhibitory</b> (block or dampen the pain process)
<b>Key mediators</b> <ul style="list-style-type: none"><li>• Glutamate</li><li>• Substance P</li><li>• Prostaglandins</li></ul>	<b>Key mediators</b> <ul style="list-style-type: none"><li>• Opioids</li><li>• Norepinephrine</li><li>• Serotonin</li><li>• Gamma-aminobutyric acid (GABA)</li></ul>

# Mechanisms of Action of Analgesics



- **Decrease excitability of nociceptors**
- **Decrease transmission in peripheral nervous system**
- **Block transmission of pain signals centrally**
- **Upregulate descending pain modulatory pathways**

# Drug Therapy for Acute Pain



- **Classes of medications**
  - **Opioids**
  - **Nonopioids (NSAIDs, acetaminophen)**
  - **Anticonvulsants**
  - **Antidepressants**
  - **Local anesthetics**
  - **Alpha-2 agonists**

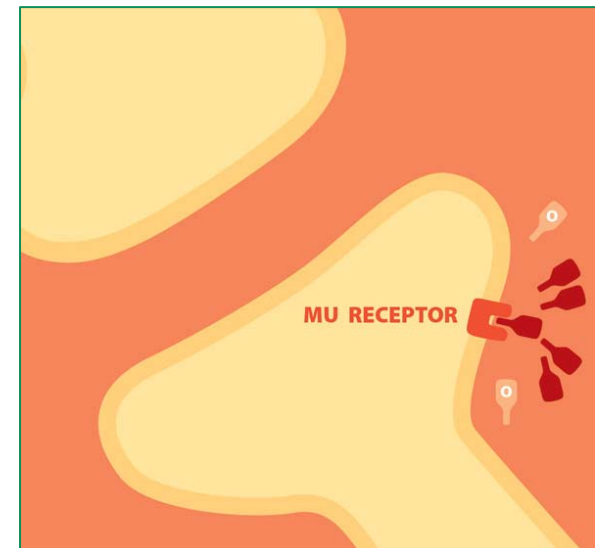
NSAID=nonsteroidal anti-inflammatory drug.

# Classes of Pain Medications: Opioids



**Examples: morphine, oxycodone, fentanyl**

- Remain therapeutic mainstay for moderate to severe pain management
- May also play a role in mild to moderate pain when NSAIDs are contraindicated
- Most common agents in the class act at the mu receptor
- Agonistic effects both in peripheral nociceptors and centrally (spinal cord and descending pathway)
- Side effects/limitations
  - Risk of respiratory depression
  - Risk of other side effects (eg, nausea, constipation)
  - Potential for tolerance over time



# Classes of Pain Medications: Nonopioids



- **NSAIDs**    **Examples: celecoxib, ketorolac**
  - Possess both anti-inflammatory and analgesic effects
  - Principle mechanism of action is inhibition of prostaglandin synthesis
  - Act at peripheral nociceptors and in the spinal cord
  - Side effects depend partly on whether drugs are selective (COX-2) or nonselective
    - Impaired hemostasis (nonselective)
    - GI irritation/bleeding (nonselective)
    - Cardiovascular risk
    - Renal toxicity
- **Acetaminophen**
  - Analgesic but not anti-inflammatory
  - 20%-30% weaker than NSAIDs
  - Lacks the adverse effects of NSAIDs
  - Hepatotoxic in overdose



GI=gastrointestinal.

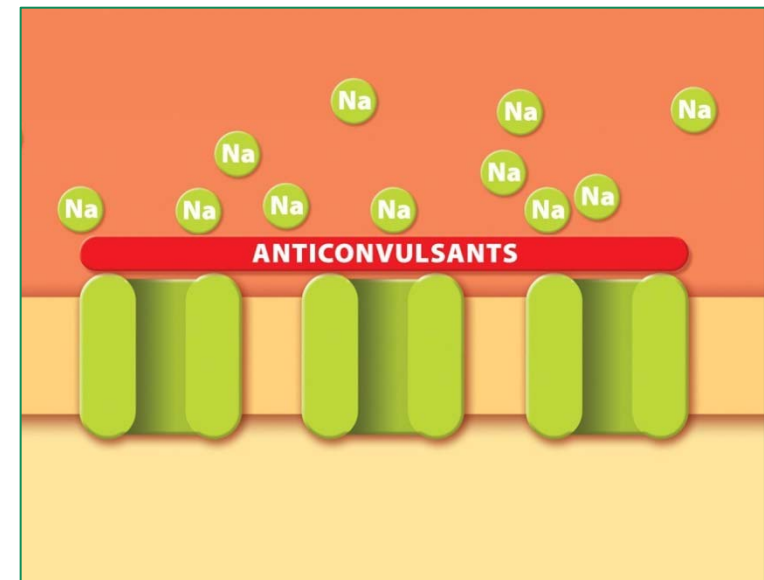


# Classes of Pain Medications: Anticonvulsants



**Examples: gabapentin, pregabalin, lamotrigine**

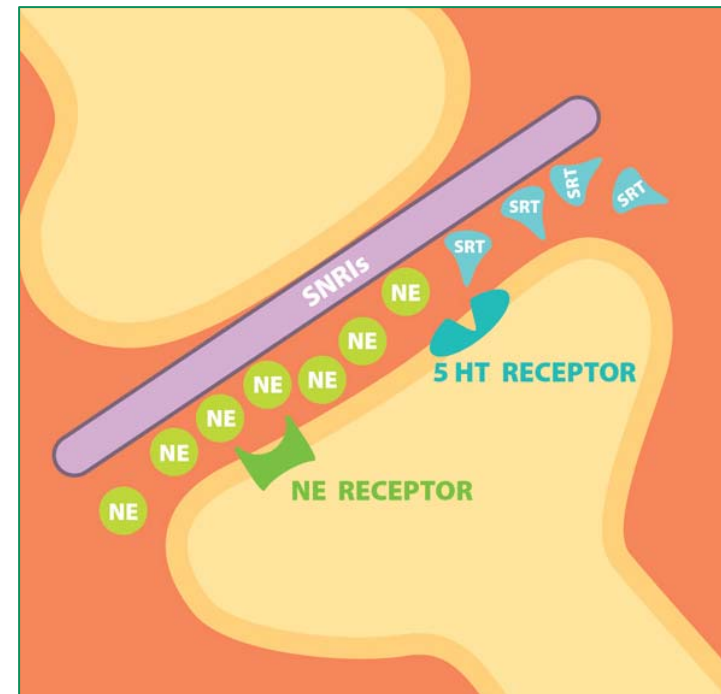
- **Decrease excitability of neurons by modulating sodium channels; do not act on GABA**
- **Emerging as top-line adjunct in acute pain and first-line therapy in chronic pain**
- **Side effects/limitations**
  - **Most common side effects are CNS related, including sleepiness, dizziness, and fatigue**



# Classes of Pain Medications: Antidepressants



- **Tricyclics** Examples: amitriptyline, nortriptyline, desipramine
  - Inhibit both norepinephrine (NE) and serotonin reuptake to varying degrees
  - Possess other properties (eg, local anesthetic-like activity)
- **SNRIs** (serotonin norepinephrine reuptake inhibitors) Examples: venlafaxine, duloxetine, bupropion
  - Selective serotonin reuptake inhibitors (SSRIs) have not been shown to be particularly effective as pain therapy
- Side effects vary by class of agent, and include dry mouth, blurred vision, nausea, constipation, agitation, dizziness, and drowsiness

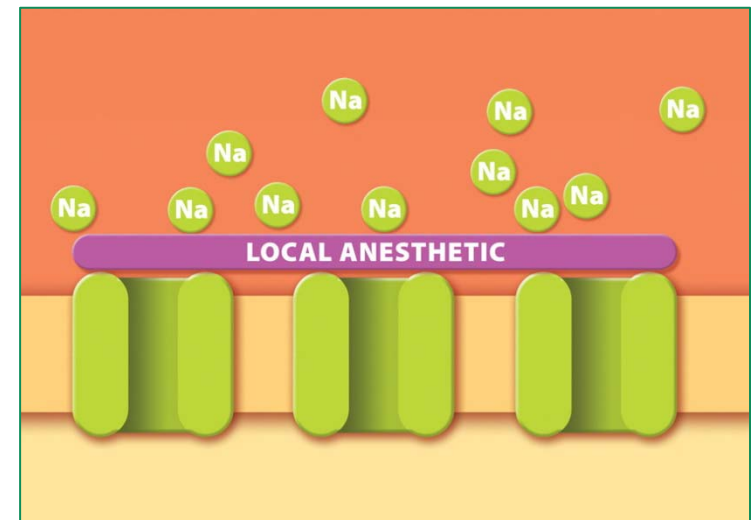


# Classes of Pain Medications: Local Anesthetics



## Examples: lidocaine, bupivacaine

- Modulate sodium channels
- When administered peripherally, may produce differential—also known as sensory—block
  - Interrupts some nerve conduction, but leaves motor function unaffected
  - Some nerves are more readily blocked than others, depending on size and myelination
- Epidurally, interrupts pain input at the nerve roots
- Associated with few side effects

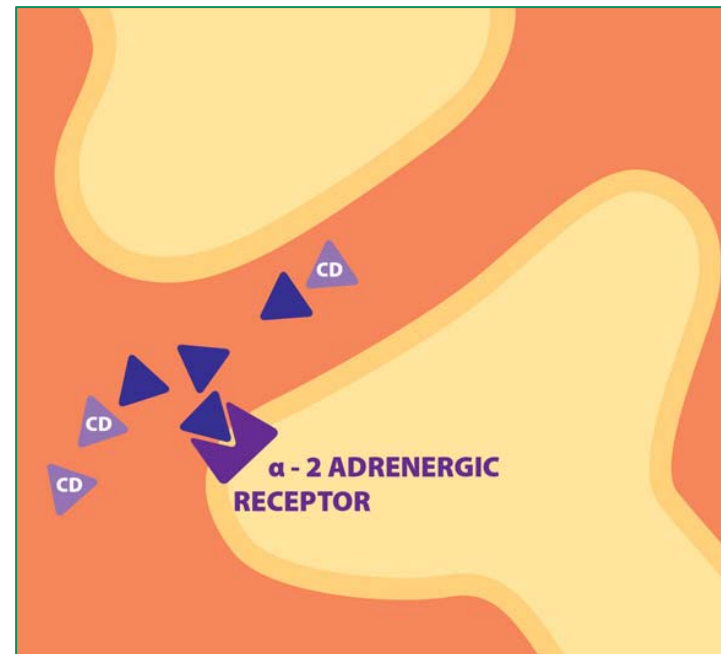


# Classes of Pain Medications: Alpha-2 Agonists



**Examples: clonidine, dexmedetomidine**

- Exerts its antinociceptive through inhibition of norepinephrine release
- Clonidine may be used epidurally as primary analgesic postoperatively
- Limited by sedation and hypotension



# Audience Response



- **Which of the following statements best describes multimodal analgesia?**
  - 1. Any combination of 2 or more analgesics**
  - 2. Combining analgesics with pre-emptive side-effect treatment**
  - 3. Combinations of drugs and techniques with differing mechanisms of action**
  - 4. Using regional local anesthetic techniques with systemic analgesia**

# Drug Therapy of Acute Pain: an Evolving Understanding



- **Recognizing the need for a multimodal approach to drug therapy**
  - **Combinations of drugs and techniques that target more than 1 pain mechanism, not 2 drugs that target the same**
  - **Not a new concept, but one that is gaining increasing attention as a therapeutic framework**
  - **Strong evidence to support the utility of this approach; incorporated into major pain management guidelines**
    - **American Pain Society (APS)<sup>1</sup>**
    - **American Society of Regional Anesthesia and Pain (ASRA)<sup>2</sup>**
    - **American Society of Anesthesiology (ASA)<sup>3</sup>**

1. Gordon DB, et al. *Arch Intern Med.* 2005;165:1574-1580.

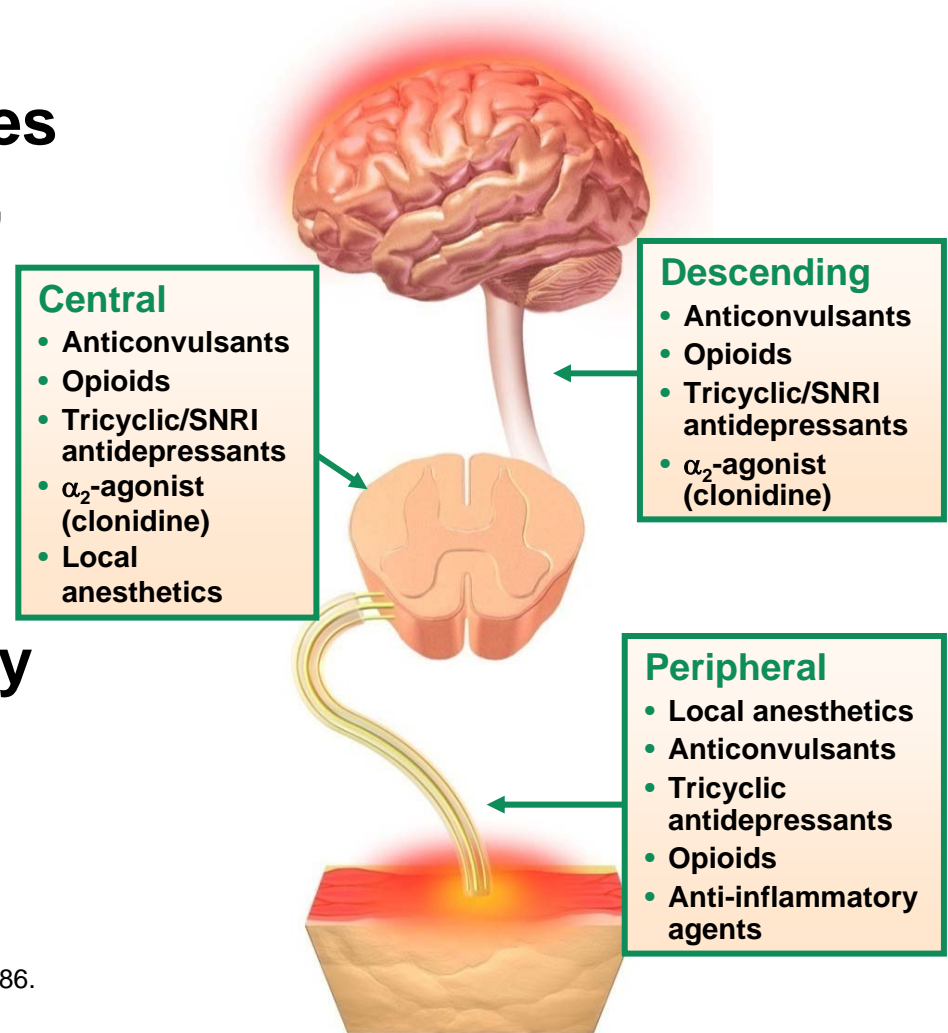
2. Rathmell JP, et al. *Reg Anesth Pain Med.* 2006;31:1-42.

3. American Society of Anesthesiologists Task Force on Acute Pain Management. *Anesthesiology.* 2004;100:1573-1581.

# Multimodal Therapy: Clinical Advantages



- **Multimodal therapy provides a way to achieve balanced, safer pain therapy<sup>1</sup>**
  - Improved quality of analgesia<sup>2,3</sup>
  - Fewer side effects<sup>2,3</sup>
  - Better functional status<sup>4</sup>
- **Distinct from polypharmacy**



1. Gottschalk A, Smith DS. *Am Fam Physician*. 2001;63:1979-1984, 1985-1986.  
2. Tiippana EM, et al. *Anesth Analg*. 2007;104:1545-1556.  
3. Reuben SS, Buvanendran A. *J Bone Joint Surg Am*. 2007;89:1343-1358.  
4. Basse L, et al. *Brit J Surg*. 2002;89:446-453.

# Drug Therapy of Acute Pain: Moving to a Multimodal Strategy



- **Multimodal therapy: combining classes of agents**
  - Opioids plus NSAIDs reduced postoperative morphine use by approximately 50%, with associated decrease in opioid-induced side effects and increase in patient satisfaction<sup>1-3</sup>
  - Opioid plus gabapentin or pregabalin reduced opioid requirements, pain, and opioid-induced side effects<sup>4,5</sup>
  - Combining 2 classes of agents with opioids extends the multimodal model
- **Use of pregabalin and COX-2 selective NSAID in conjunction with PCA morphine<sup>6</sup>**
  - Reduced pain and opioid use compared with each agent alone
  - Also reduced incidence of nausea and vomiting

PCA=patient-controlled analgesia.

1. Elia N, et al. *Anesthesiology*. 2005;103:1296-1304.

2. Stephens J, et al. *Rheumatology*. 2003;42(suppl 3):iii40–iii52.

3. Zimmel MH. *AANA J*. 2006;74:49-60.

4. Tiippana EM. *Anesth Analg*. 2007;104:1545-1556.

5. Mathiesen O, et al. *BMC Anesthesiol*. 2007;7:6-7.

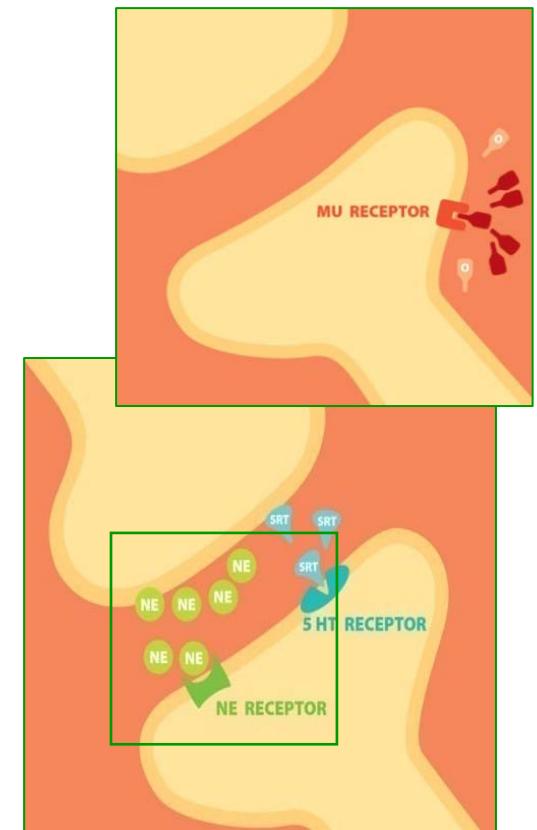
6. Reuben SS, Ekman EF. *Anesth Analg*. 2007;105:228-232.



# Moving to a Multimodal Strategy: Dual-action Analgesics



- **A single drug with dual mechanisms of action**
  - First in class: tramadol
- **Newest dual-mechanism agent is tapentadol:**
  - Acts on mu opioid receptors and inhibits reuptake of norepinephrine<sup>1</sup>
  - Clinical trial experience:
    - Comparable to oxycodone in acute pain (bunionectomy)<sup>2</sup> and in more chronic pain (up to 90 days in joint or back pain)<sup>3</sup>
    - Comparable or better pain relief than morphine in dental surgery<sup>4</sup>
    - Main side effects similar to conventional opioids (GI, CNS), but significantly better GI profile, including lower rate of constipation<sup>3,5</sup>
  - May be associated with less tolerance<sup>1</sup>
  - May be useful in patients with opioid sensitivity



1. Tzschentke TM, et al. *Drugs Future*. 2006;31:1053–1061.  
2. Oh Abstract 229 American Pain Society 2008.  
3. Oh Abstract 226 American Pain Society 2008.

4. Kleinert R, et al. *J Pain*. 2006;7(4 suppl 2):S44 abstr 773.  
5. Hadrick Abstract 222 American Pain Society 2008.

# Drug Therapy of Acute Pain: Implications for Future Practice



- **Multimodal therapy will continue to evolve through use of novel agents and technologies**
  - Dual-mechanistic agents
  - New formulations (eg, extended-release epidural agents)
  - New delivery systems (eg, controllable transdermal systems)
- **Nurses need to have increased knowledge of the physiology of pain and pharmacotherapy in order to better understand and safely administer multimodal analgesia**
  - Focused assessments and reassessments
  - More consistent and reliable dosing to reduce analgesic gaps
  - More options to advocate for individual patient's treatment needs



# Multimodal Management of Postoperative Pain in a High-risk Patient

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# Case Presentation



- **NB is a 60-year-old female admitted for total abdominal hysterectomy**
- **She has a 15-year history of uterine fibroids that have recently increased significantly in size and are now accompanied by mild to moderate dysfunctional uterine bleeding and occasional transient mild pain**
- **Enlarged uterus necessitates an invasive midline incision**

# Case Presentation: Secondary Diagnoses



- **Obesity**
  - Weight=185 lb (84 kg)
  - Height=5'4"
  - BMI=32 kg/m<sup>2</sup> (>30 kg/m<sup>2</sup> = obese)
- **Obstructive sleep apnea (OSA)**
  - This is a recent diagnosis post sleep analysis
  - Room air CPAP during sleep has been prescribed

CPAP=continuous positive airway pressure.

# Case Presentation: Current Medications



- **Estradiol 0.5 mg daily**
- **Progesterone 100 mg daily**
- **Calcium 500 mg twice daily**
- **Acetaminophen 325 mg every 6 hours PRN for uterine pain**
- **Ibuprofen 400 mg every 6 hours PRN for uterine pain (held for 5 days preoperatively)**

# Audience Response



- **Which of the following increases the risk of opioid-induced respiratory depression for this patient?**
  - 1. Occasional mild preoperative pain**
  - 2. BMI of 32 kg/m<sup>2</sup>**
  - 3. History of uterine fibroids**
  - 4. Preoperative use of NSAIDs and acetaminophen**

# Case Presentation: Other Considerations



- **This is the patient's first surgery; she has been hospitalized previously only for the births of her children**
- **She has a very sedentary lifestyle**
- **She admits poor compliance with use of prescribed room air CPAP during sleep**



# Case Presentation: Other Considerations



- **This patient has never taken opioids before**
- **The only analgesics she has ever taken are nonopioids, such as ibuprofen**
- **Though intraspinal analgesia would be an excellent option considering her risk factors, she absolutely refuses intraspinal analgesia**

# Patient Characteristics to Consider in Planning Care for This Patient



- **Obesity with sedentary lifestyle habits, OSA, and a highly invasive (large incision) surgical technique**

**=**

**increased risk of numerous postoperative adverse effects and complications**

- **Opioid naïve; never received opioid analgesics**

**=**

**unable to provide any historical information in terms of her tolerance of opioid analgesics**

# Audience Response



- **Which of the following is most appropriate for this patient during the first 24 hours postoperatively?**
  - 1. PRN oral opioid-nonopioid analgesia**
  - 2. Around-the-clock IV opioid bolus doses and acetaminophen**
  - 3. IV opioid PCA, IV ketorolac, and oral pregabalin**
  - 4. IV opioid PCA with a low-dose basal rate**

# Populations of Special Concern



- **Opioid naïve**

- **Tolerance to respiratory depressant effects of opioids develops within several days<sup>1</sup>**
- **First 24 hours after surgery represents a high-risk period for a respiratory event<sup>2,3</sup>**
  - **Of patients experiencing respiratory depression associated with a serious or fatal outcome, the event occurred in the first 24 hours in 50% of IV PCA cases and in 62% of spinal/epidural cases<sup>2</sup>**
- **Opioid-related sedation is greatest within the first 4 hours after discharge from the PACU<sup>4</sup>**

1. Miaskowski C, et al. *Guideline for the Management of Cancer Pain in Adults and Children*. Glenview, IL: APS; 2005.

2. Weinger MB. *APSF Newsletter*. 2007;21:61.

3. Taylor S, et al. *Am J Surg*. 2003;186:472-475.

4. Taylor S, et al. *Am J Surg*. 2005;190:752-756.

# Populations of Special Concern



- **Obesity**

- **At increased risk for respiratory depression<sup>1</sup>**

- **May result from mechanical causes**
    - **May result from erroneous practice of dosing opioids based on weight, leading to overdosing<sup>2</sup>**

- **Therapy**

- **Implement a multimodal analgesic approach, start preoperatively**
    - **Give lowest effective opioid dose, titrate gradually**
    - **In general, avoid basal rate with opioid PCA<sup>3</sup>**
    - **Monitor closely for side effects**

1. Horlocker T. *ASA Newsletter*. [http://www.asahq.org/Newsletters/2007/06-07/horlocker06\\_07.html](http://www.asahq.org/Newsletters/2007/06-07/horlocker06_07.html). Accessed August 11, 2008.

2. Shibutani K, et al. *Br J Anaesth*. 2005;95:377-383.

3. Krenzischek DA, et al. *J Perianesth Nurs*. 2008;23:S28.

# Populations of Special Concern



- **Obstructive sleep apnea**
  - At increased risk for respiratory depression<sup>1</sup>
  - Often overlooked in association with opioid administration
  - **Assessment should include**
    - More frequent monitoring of sedation and respiratory status
    - Sedation precedes respiratory depression
    - RT consultation; CPAP; consider capnography
  - **Therapy**
    - Lowest effective opioid dose
    - More aggressive use of other classes of analgesics

RT=respiratory therapist.

1. Horlocker T. *ASA Newsletter*. [http://www.asahq.org/Newsletters/2007/06-07/horlocker06\\_07.html](http://www.asahq.org/Newsletters/2007/06-07/horlocker06_07.html). Accessed August 11, 2008.

# Populations of Special Concern



- **Extensive surgery and tissue injury**
  - **Physical components of pain**
    - Type of surgery<sup>1,2</sup>
    - Extent of injury/invasiveness of procedure<sup>3</sup>
    - Location of incision<sup>2</sup>
    - Incision size<sup>1</sup>
    - Presence of tubes and drains<sup>3</sup>
  - **Emotional components of pain**
    - Effects of particular diagnosis or reason for surgery

1. Kalkman CJ, et al. *Pain*. 2003;105:415-423.

2. Filos KS, Lehmann KA. *Eur Surg Res*. 1999;31:97-107.

3. Pasero C, Belden J. *J Perianesth Nurs*. 2006;21:168-176.

# Multidisciplinary Postoperative Treatment Plan



- **Foster a coordinated effort between nursing, medicine, and other disciplines that focuses on the patient's risk factors**
  - **Aggressive ambulation is critical but could be hampered by invasive surgery and potential reluctance or difficulty ambulating because of obesity and sedentary habits**
  - **Preoperative education: patient must understand the necessity and expectation of frequent scheduled ambulation**
  - **Effective pain control will be imperative**



# Address All Patient Risk Factors



- **Develop a pain treatment plan that focuses on reducing the potential for complications related to the patient's primary risk factors**
  - Obesity
  - Sleep apnea
- **Involve other disciplines as needed to maximize patient outcomes**

# Establish Comfort-function Goal



- **Establish a realistic comfort-function goal that allows the patient to ambulate and participate in recovery with relative ease<sup>1</sup>**
- **Maximize the pain treatment to facilitate achievement of the comfort-function goal<sup>1</sup>**
- **Keep patient focused on achievement**
- **Immobility is the obese postoperative patient's worst enemy!**

# Selected Regimen



- **“On call to the OR” acetaminophen 1000 mg, celecoxib 400 mg, pregabalin 150 mg**
- **Pre-incision local anesthetic infiltration**
- **Slow IV Dilaudid comfort in PACU**
- **Initiate IV Dilaudid PCA in PACU (0.2 mg/PCA dose; 6-minute lockout)**
- **Transition from IV Dilaudid to modified-release opioid after 24 hours**
- **Continue acetaminophen, celecoxib, and pregabalin throughout postoperative period**

# Principles of Analgesic Use in Patients at High Risk for Opioid-induced Adverse Effects



- **Administer the lowest effective opioid dose**
  - Minimize opioid-induced adverse effects
- **Multimodal analgesia**
  - Combinations that target different mechanisms
  - Lower doses = fewer and less severe side effects
- **Preemptive (preventive) approach**
- **Vigilant monitoring**

# Summary



- **Thorough preoperative assessment with a focus on identification of high-risk factors for postoperative complications**
- **Provision of lowest effective opioid dose through a multimodal analgesic approach**
- **Vigilant monitoring for pain, adverse effects**
- **Aggressive postoperative rehabilitation aimed at reducing pulmonary dysfunction and increasing mobility and function**



# Multimodal Approach to the Care of a Patient With Fibromyalgia

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# Case



- **Danielle is a 45-year-old woman with a history of depression who was diagnosed 2 years ago with fibromyalgia**
- **She is a school teacher and a mother of 3 children, ages 8-14**
- **She visits her PCP's office at least once a month with ongoing complaints of pain (5-10/10), debilitating fatigue and inability to sleep, inability to maintain household responsibilities and keep up with her children**

# Current Treatment



- **Medications**

- **Controlled-release oxycodone 20 mg PO BID**
- **Oxycodone IR 5-10 mg Q4H PRN (typically takes 4 doses/day)**

- **Lifestyle features**

- **Physically inactive**
- **Comforts herself with food**
- **Catnaps on the couch rather than sleeping through the night**
- **Uses no stress management techniques**



# Audience Response



- **Using a multimodal analgesic approach, what would you add to Danielle's medication regimen?**
  - 1. Transdermal fentanyl with celecoxib (Celebrex™)**
  - 2. Amitriptyline (Elavil™) and gabapentin (Neurontin™)**
  - 3. Prednisone and fluoxetine (Prozac™)**
  - 4. Duloxetine (Cymbalta™) and pregabalin (Lyrica™)**

# Audience Response



- **Patient education has a positive therapeutic benefit in patients with fibromyalgia.**
  1. True
  2. False

# Goals of Therapy



- **Effectively manage pain**
- **Restore normal sleep**
- **Improve physical stamina**
- **Provide emotional and social support**

*And for our patient, Danielle...*

*Taper opioids with goal of eventual discontinuation*

# Fast Facts



- **Patients with fibromyalgia have approximately 10 outpatient clinic visits per year and 1 hospitalization per 3 years<sup>1</sup>**
- **Estimated health care costs range from \$2,000 to \$6,000 per year<sup>2</sup>**
- **Symptoms are often exacerbated by exertion, stress, lack of sleep, and weather changes, or after physical or emotional trauma<sup>3</sup>**
- **Approximately 30% of patients with fibromyalgia are diagnosed as having concurrent depression or anxiety disorders<sup>4</sup>**
- **70% of patients with chronic fatigue syndrome meet criteria for fibromyalgia<sup>5</sup>**

1. Wolfe F, et al. *Arthritis Rheum.* 1990;33:160-172.

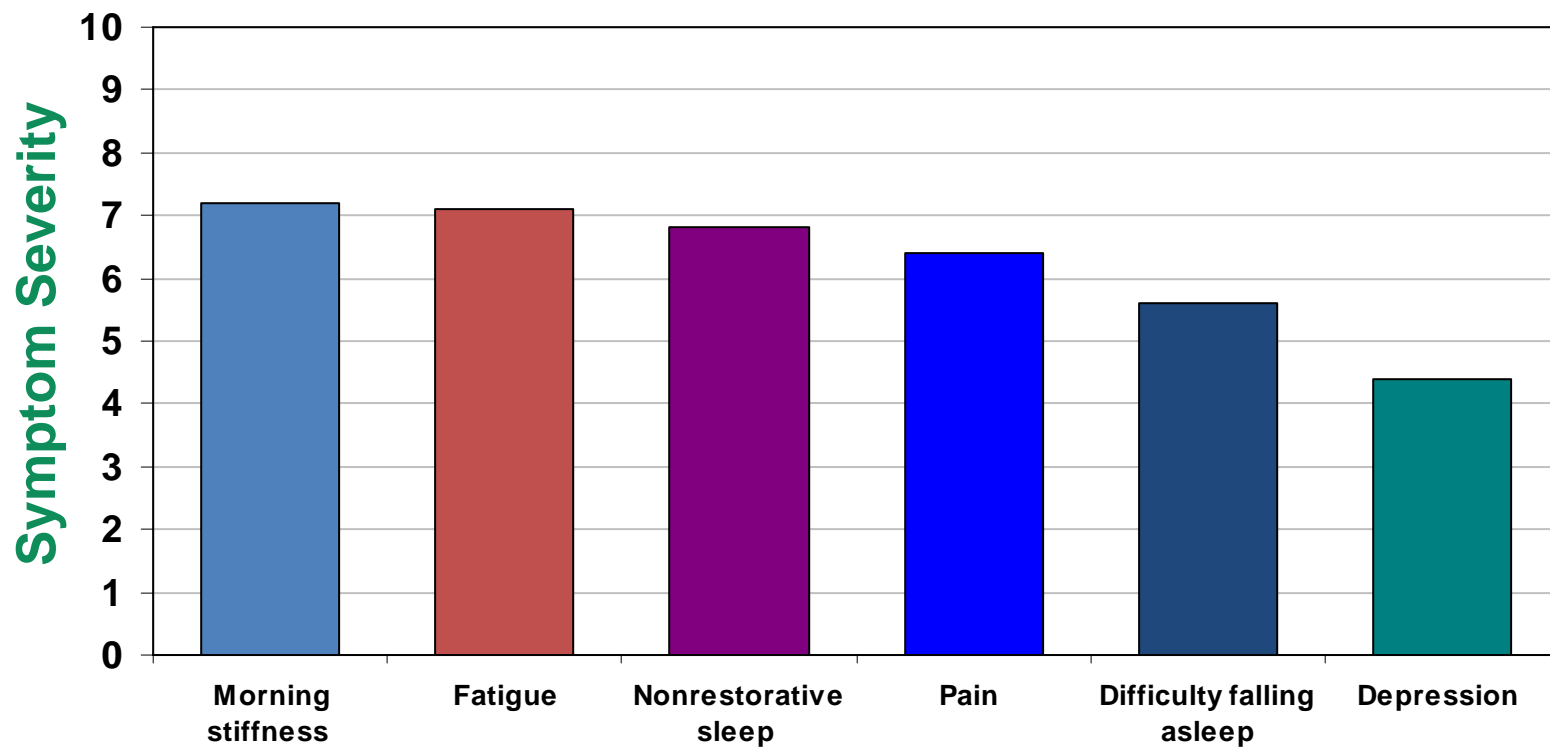
2. Robinson RL, et al. *J Rheumatol.* 2003;30:1318-1325.

3. Goldenberg DL. *Arthritis Rheum.* 1993;36:1489-1492.

4. Hudson JI, et al. *Am J Med.* 1992;92:363-367.

5. Goldenberg DL, et al. *Arthritis Rheum.* 1990;33:381-387.

# Common Symptoms and Severity: National Fibromyalgia Association Survey



N=2,569

# Treatment Strategies for Fibromyalgia



## Specific Treatment Recommendations<sup>1</sup>

- **Analgesics<sup>1,2</sup>**
  - Opioids
  - Anticonvulsants<sup>2-5</sup>
  - Antidepressants (low dose)<sup>1,6</sup>
    - Tricyclics, SSRIs, SNRIs
- **Sleep medications<sup>1</sup>**
- **Exercise, physical medicine<sup>1</sup>**
- **Patient education<sup>1</sup>**
- **Counseling, mental health professional<sup>1</sup>**

## Advanced Fibromyalgia Management<sup>1</sup>

- **Multidisciplinary care<sup>1</sup>**
  - Rheumatologist
  - Psychiatrist, physical therapist, etc.
  - Psychiatrist, psychologist, etc.
- **Pain management expertise<sup>1</sup>**
- **Structured, supervised exercise; rehabilitation programs<sup>1</sup>**
- **Cognitive-behavioral therapy, stress reduction programs<sup>1,5</sup>**

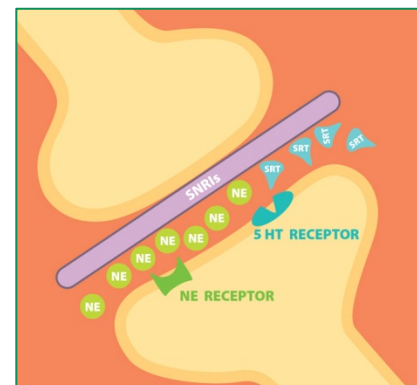
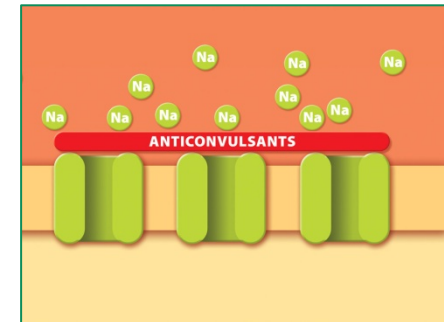
1. Goldenberg DL. *Rheum Dis Clin North Am.* 2002;28:437-446, xi.  
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# Multimodal Therapy: Targeting Pain Throughout the Pathway



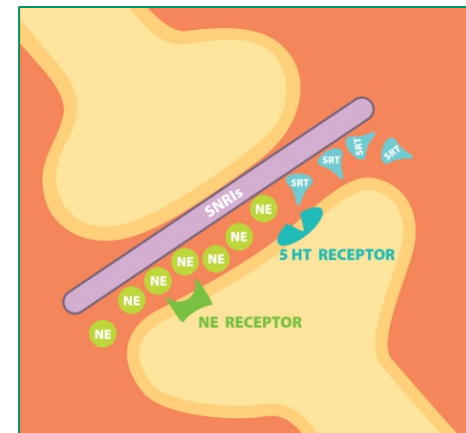
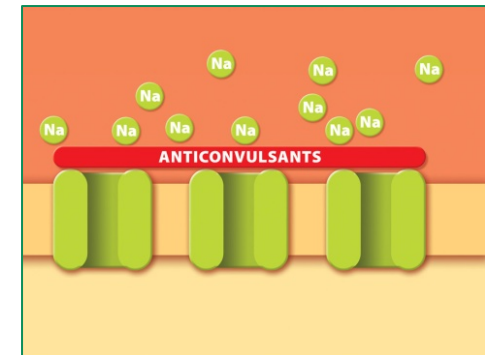
- Different classes of agents act on different parts of the pain pathway based on their receptor targets
- Multimodal regimens use these differences to improve pain control
- Result is a more rational approach to pain therapy



# Multimodal Analgesia in Fibromyalgia



- **Anticonvulsants**
  - Decrease excitability of neurons by modulating sodium and calcium channels
  - Emerging as first-line adjunct in acute pain and first-line therapy in chronic pain
- **Antidepressants**
  - Tricyclics, SNRIs
  - Inhibit both NE and serotonin (5HT) reuptake to varying degrees
  - Possess other properties, such as local anesthetic-like activity
- **Both classes shown to have utility in fibromyalgia**





# Initial Treatment Plan



- **SNRI: Duloxetine (Cymbalta™)**
- **Aerobic exercise**
- **Cognitive-behavioral therapy**
- **Patient education including sleep hygiene and diet**
- **Interdisciplinary approach**

## Top Reasons to Refer Patients to a Pain Specialist or Pain Center



- **Uncontrolled, severe pain (eg, pain that is unresponsive to escalating doses of medication)**
- **Significant, ongoing disruption of physical and/or psychosocial functioning (eg, deteriorating coping skills, excessive disability)**
- **Comorbid psychiatric disorder (eg, substance abuse, severe depression, anxiety disorder)**

## Top Reasons to Refer Patients to a Pain Specialist or Pain Center (cont'd)



- **Diagnostic evaluation for unknown etiology or complex pain syndromes**
- **Validation of a diagnosis and treatment plan**
- **Consultation for treatment recommendations (eg, physical therapy, acupuncture, surgery, epidural injections) or modalities not available in the primary care setting**
- **Inability to establish mutually agreeable treatment goals (eg, poor patient adherence, persistent demands for new tests or treatments)**

# Continuing Treatment Plan



- **Continue Lyrica and duloxetine**
- **Refer to a physical therapist**
- **Attend support group meetings**
- **Access to online resources**
  - **The American Chronic Pain Association**
    - [www.theacpa.org](http://www.theacpa.org)
  - **The Fibro Center**
    - [www.fibrocenter.com](http://www.fibrocenter.com)
  - **The Fibromyalgia Network**
    - [www.fmnetnews.com](http://www.fmnetnews.com)

# Summary



- **Fibromyalgia is a relatively common, complex syndrome characterized by widespread musculoskeletal and soft tissue pain and associated with medical and psychiatric comorbidities**
- **The most effective treatment for fibromyalgia includes both pharmacologic and nonpharmacologic approaches**
- **Medications may reduce symptoms but are more likely to be effective if taken in conjunction with exercise, cognitive behavioral therapy, and patient education**



# Multimodal Strategy: Implications for Nursing Practice

Rosemary C. Polomano, RN, PhD, FAAN, Chair

# Multimodal Strategy: Implications for Nursing Practice



- **Effective and safe practices with multimodal strategies require that nurses:**
  - **Understand the rationale for combining analgesics<sup>1,2,4</sup>**
  - **Be knowledgeable about classes of analgesics<sup>1,2,4</sup>**
    - **Mechanisms of action and pharmacodynamics**
    - **Synergistic and adverse effects**
  - **Ensure timely administration of all analgesics, avoiding gaps in analgesia<sup>2-4</sup>**
  - **Institute proper assessment and monitoring practices<sup>2,3</sup>**
  - **Aggressively manage adverse effects of analgesics<sup>1,2,4</sup>**
  - **Remain informed about novel dual-mechanistic analgesics and drug delivery systems<sup>1,2,4</sup>**

1. Krenzischek DA, et al. *Pain Manag Nurs*. 2008;9:S22-32.

2. Dunwoody CJ, et al. *Pain Manag Nurs*. 2008;9:S11-21.

3. Polomano RC, et al. *Pain Manag Nurs*. 2008;9:S3-10.

4. Polomano RC, et al. *Pain Manag Nurs*. 2008;9:S33-41.



# Questions & Answers

## Faculty Panelists

Moderated by Rosemary C. Polomano, RN, PhD,  
FAAN, Chair





# Understanding the Pharmacology of Analgesics

*Part of the INROADS into Pain Management Series*

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