Disclosures:

Conflict of interest statement:

We certify that, to the best of our knowledge, no aspect of our current personal or professional situation might reasonably be expected to affect significantly our views on the subject on which we are presenting.

Objectives:

- Identify complications of unrelieved postoperative pain.
- Identify goals of post operative pain control.
- Identify interventions that improve postoperative pain control.

COMPLICATIONS OF UNCONTROLLED POST OPERATIVE PAIN

Post Operative Pain

- Normal Response to surgical intervention
- Occurs secondary to tissue trauma or direct nerve injury
- Results in
  - Allodynia
  - Primary and Secondary Hyperalgesia
- Untreated pain leads to reduced patient satisfaction and can delay healing
- Places increased burden on patient and health system

Types of Pain	
Nociceptive Pain	• Normal processing of stimuli that damages normal tissue • Responds to opioids
Somatic	• Pain arises from bone, joint, muscle , skin or connective tissue • Aching, throbbing • Localized
Visceral	• Arises from visceral organs • Tumor: localized pain • Obstruction of hollow viscus: poorly localized
Neuropathic Pain	• Abnormal processing of sensory input by PNS or CNS
Centrally generated	• Deafferentation pain: injury to PNS or CNS (eg. Phantom pain) • Sympathetically maintained pain: dysregulation of autonomic nervous system (eg. Complex Regional Pain Syndrome)
Peripherally generated	• Painful polyneuropathies: pain is felt along the distribution of many peripheral nerves (eg. Diabetic neuropathy) • Painful mononeuropathies: associated with a known peripheral nerve injury (eg. Nerve root compression, trigeminal neuralgia)

Data from Pasero C, McCaffery M. Pain assessment and pharmacologic management. (MO): Elsevier/Mosby; 2011

Potential Physiologic Complications

- Decreased ventilation, atelectasis, pulmonary consolidation
- Tachycardia
- Hypertension
- Insomnia
- Impaired wound healing
- Chronic post-surgical Pain
- Unanticipated admission/readmission

Barriers to Providing Optimal Pain Relief

- Insufficient knowledge
- Fear of medication side effects
- Inadequate patient preparation

PLANNING FOR POST OPERATIVE PAIN

Preoperative Period

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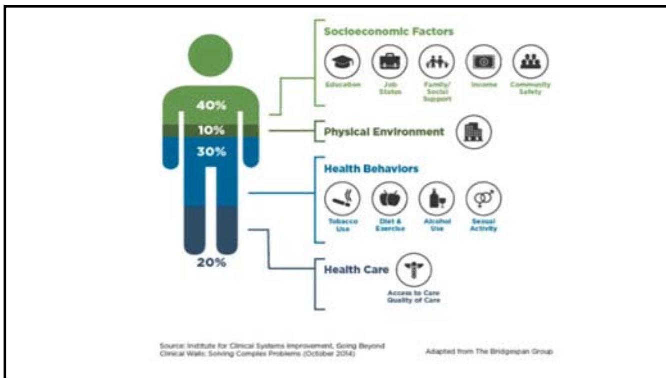
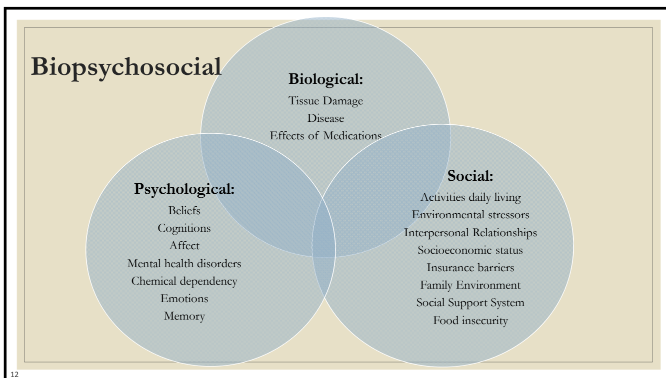
Identify: Potential Risk Factors

- Preoperative pain
- Preoperative anxiety
- Younger patients
- Female patients
- Mental Health Diagnosis
- Surgery type
- Surgery duration
- Intolerance or contraindication to analgesics
- Contraindications to anesthesia





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Intervene: Preoperative

- Set realistic expectations
- Consistent preoperative education messages
- Identify predictors for uncontrolled pain
- Address modifiable predictors early
- Employ multimodal analgesia

PLANNING FOR POST OPERATIVE PAIN

Inpatient Postoperative Period

Implement:
Pharmacologic & Non-Pharmacologic Techniques

- Identify costs and benefits to different approaches
- Goals:
  - Improve quality of recovery
  - Reduce length of stay in PACU and inpatient
  - Potentially reduce opioid requirements
  - Minimize risk and Maximize benefit

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Intervene:
Postoperatively: Opioids

- Avoid morphine in renal impaired patients, can cause increased sedation due to poor metabolism
- Dilaudid has a lower incidence of sedation and itching than morphine
- Fentanyl is less likely to cause hypotension. Has rapid onset and short duration of action
- Avoid tramadol if history of seizures, renal impairment, or on SSRIs/SNRIs

OPIOID FAST FACTS

Opioid	Oral	Parenteral
Morphine	30 mg	10 mg
Hydromorphone	7.5 mg	1.5 mg
Oxycodone	20 mg	---
Hydrocodone	30 mg	---
Fentanyl	---	0.1 mcg

Morphine Equivalent Dose	Conversion (morphine: methadone)
≤ 300 mg of PO morphine/day	5:1
301 mg – 600 mg of PO morphine/day	10:1
601 mg - 800 mg of PO morphine/day	12:1
801-1000 mg of PO morphine/day	15:1
>1000 mg of PO morphine/day	20:1

Medication	Onset	Approx. Duration
Morphine IV	5 min	4 hours
Morphine PO immediate release	30 min	4 hours
Morphine PO extended release	30-60 min	8-24 hours
Hydromorphone IV	15 min	4 hours
Hydromorphone PO immediate release	30 min	4 hours
Oxycodone PO immediate release	10-15 min	3-6 hours
Oxycodone PO extended release	30-60 min	12 hours
Hydrocodone PO	30 min	4-6 hours
Fentanyl IV	Immediate	30-60 min
Methadone IV	15 min	6 hours
Methadone PO	30-60 min	8 hours Methadone duration of action may be longer when prescribed for opioid use disorder

IV OPIOIDS		ORAL OPIOIDS	
PROS	CONS	PROS	CONS
RAPID ONSET OF ACTION	Increased adverse effects when compared to oral form: • Euphoria • Nausea • Hypotension	LONGER DURATION OF ACTION (AVG 4-6 HOURS)	Can take 15-30 minutes to take effect
"IV PAIN MEDICATION IS GOOD FOR RAPIDLY TREATING AN EPISODE OF SEVERE PAIN."	Intermittent dose spikes create a pattern similar to the one known to drive addiction in animal models.	"ORAL MEDICATIONS WILL HELP TO EVEN OUT YOUR PAIN CONTROL AND LAST LONGER."	When oral medications are taken together, this can create a more potent effect that can last longer.

Intervene: Postoperatively: Use adjuvants

- Schedule acetaminophen. Analgesic effects 30% less than NSAID, but fewer side effects compared to NSAID
- Add NSAID when able; added to opioids can decrease opioid use and lead to less opioid related side effects. Contraindicated with renal dysfunction
- Synergistic effect of gabapentin and opioids results in lower opioid doses
- Dexamethasone is preferred steroid, can also reduce PONV
- Local anesthetics (Lidoderm patch, wound infiltration)

ACTION	AGENT	RECEPTOR
Inhibit central hyperexcitabilty Peripheral +/- central nervous system	local anesthetics (wound infiltration)	Sodium channel (free peripheral nerve endings/central nervous system)
Inflammation Reduction Decrease afferent neurotransmission Peripheral and central nervous system	Acetaminophen NSAIDs Dexamethasone	Cox-I, Cox-II
Afferent Slowing Peripheral and central nervous system	Pregabalin, Gabapentin	Calcium Channel
Spinal and Supraspinal Modulation Central nervous system	Opioids	Opioid Receptors
Anti-nociceptive Interneuron Activation Membrane stabilization	Benzodiazepines SNRI/TCA	GABAa Norepinephrine reuptake Serotonin reuptake
Pro-nociceptive Interneuron Blockade Dorsal Horn of Spinal Cord	Ketamine Dextromethorphan Methadone	NMDA receptor
Descending Inhibition CNS	Tizanadine, Methocarbamol Clonidine Dexmedatamidine (Precedex)	Alpha-2 in locus ceruleus

Implement: Non-Pharmacologic Techniques

Goal to reduce patients perception of stress, anxiety and pain

- Comfort
- Ice
- Reposition
- Movement
- Psychologic Support
- Relaxation

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PATIENT EDUCATION

Allina Health
ABBOTT NORTHWESTERN HOSPITAL

Your Comfort Menu

This menu of comfort options was designed to help you, your nurse, and your health care provider make decisions about your comfort together. Your nurses will use your care board to write down your plan for comfort. Depending on your plan of care, you may use a combination of the comfort options.

Try Medicine for Comfort

- ❑ Ask for medicine before your pain returns or gets worse.
- ❑ Check with your doctor or nurse about adjusting your pain medicines if they don't give you relief.
- ❑ Ask your nurse about medicine to:
  - — prevent constipation (unable to have a regular bowel movement)
  - — prevent or treat nausea (upset stomach)
  - — help you sleep.
- ❑ Use your care board to know when your next dose is available.

Try Relaxation Therapies

Ask a member of your health care team to try any of these:

- ❑ aromatherapy
- ❑ breathing exercises
- ❑ relaxation exercises
- ❑ guided imagery
- ❑ listening to music or the relaxation channel.

Consider doing any religious or spiritual practices that are meaningful to you, such as prayer, meditation, reflection or positive thoughts.

Try Comfort Actions

Ask a member of your health care team for help with any of these:

- ❑ walk (as you are able)
- ❑ change positions
- ❑ take a wheelchair ride
- ❑ do gentle stretches or exercises
- ❑ talk or visit with caregivers
- ❑ limit visitors so you can rest
- ❑ dim the lighting or open or close the door or curtains
- ❑ speak with a chaplain or social worker
- ❑ therapies such as acupressure, massage, reflexology or music therapy. Ask your doctor about acupuncture.

Try Comfort Items

Ask a member of your health care team for any of these:

- ❑ extra pillows
- ❑ warm pack or ice pack
- ❑ warm blanket
- ❑ warm washcloth
- ❑ ear plugs
- ❑ hot tea or ginger tea.

Ask a member of your care circle (family member or friends) to bring in any of these:

- ❑ personal items (such as a toothbrush, floss, comb, ear swab, mouth swab and lip balm).

Try Keeping Busy

Ask a member of your care circle (family members or friends) to bring in any of these:

- ❑ reading materials
- ❑ playing cards
- ❑ puzzle books
- ❑ coloring books
- ❑ personal music player and earphones
- ❑ light hobby (like knitting)
- ❑ phone and charger.

Multidisciplinary Approach

Medical Providers

- Interventions
- Medication
- Alternative health approach (acupuncture, massage therapy, aromatherapy)
- Physical Therapy

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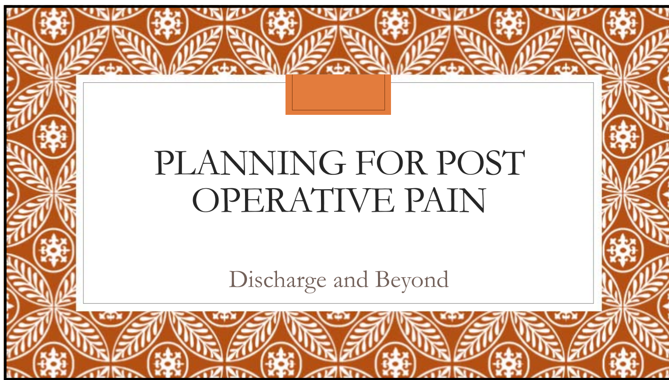
Intervene: Special Populations

- Pediatric patients often have trouble communicating about pain due to limited experiences with pain
- Elderly patients may have decreased pain perception, decreased clearance of medications
- Obesity and Sleep Apnea increase risks for postoperative complications, need closer respiratory monitoring
- Chronic Opioids used prior to surgery should not be abruptly weaned or stopped. Expect increase in levels over preoperative use. Higher self reported pain scores are typical and treatment should be based on other assessments besides number.

Allina Health Pain Assessment Scale

Score	Description
10	Worst Pain You Can Imagine
7-9	**Severe Pain** **Pain keeps you from doing your regular activities.** ⑨ Pain is so bad that you can't do any of your regular activities, including talking or sleeping. ⑧ Pain is so intense that you have trouble talking. ⑦ Pain distracts you and limits your ability to sleep.
4-6	**Moderate Pain** **Pain may interfere with your regular activities.** ⑥ Pain makes it hard to concentrate. ⑤ You can't ignore the pain but you can still work through some activities. ④ You can ignore the pain at times.
1-3	**Mild Pain** **Pain doesn't interfere with your regular activities.** ③ You may notice the pain but you can tolerate it. ② You may feel some twinges of pain. ① You may barely notice the pain.
0	No Pain

- Allina has a new version of the Pain Assessment Scale
- Provides numbers with subjective and objective symptoms.
- This can help patients and caregivers communicate about pain and share a common understanding of the level of pain the patient is experiencing.



Intervene: Discharge Planning

- Identify social determinants of health
- Person-in-environment
- Patient Centered and Strengths Based
- Biopsychosocial Approach
- Cultural considerations
- Advocate for vulnerable populations

Intervene: Discharge Planning

Have instructions on opioid weaning included in the directions so it is printed on the prescription label

- "Goal is to be tapered off in 2 weeks."
- " As pain gets better, take less and go longer between doses."
- " Max of 8 tablets a day, reduce max dose by at least one tablet every day until done"

Add Opioid Warning to Discharge Instructions

- WARNING: Opioid (narcotic) medicine, such as oxycodone (OxyContin® and Percocet®), have serious side effects and are addictive. This can lead to overdose and death.
- Consider taking non-opioid medicines (such as acetaminophen and ibuprofen) as your first choice for pain control. (Take opioids for severe pain.)
- Take the prescribed opioid dose when your pain is at its worst. Slowly cut back (taper) when you think your pain is under control. Ask your provider for specific instructions on how to taper. Be sure you know how long you should take this medicine.
- Keep this medicine in a safe place to prevent theft, misuse or abuse. Call 911 if someone accidently swallows this medicine.
- You may have higher risks for overdose or death if you have sleep apnea, drink alcohol, or if you take a benzodiazepine (sedative) medicine.
- Opioids may cause nausea, vomiting, constipation, lightheadedness, dizziness or drowsiness. Call your provider or pharmacist if any of these side effects do not get better or if they get worse.
- To help prevent constipation, eat a high-fiber diet, drink plenty of water, and be as active as you can each day. Ask your pharmacist for help choosing a laxative.
- Drop off any opioids you do not use at your local medicine disposal location (you can find local drop off locations at www.takebackday.dea.gov).

QUESTIONS?

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