
Opioid and Non-Opioid Pain Management in the Trauma Patient

Renee Theisen, FNP-BC

— George Washington University Hospital —

Acute Pain Management

BIQ..



- **George Washington University Hospital, Washington, D.C. , Acute Pain Management Service, Nurse Practitioner**
- **Georgetown University, Washington, D.C. Master of Science in Nursing**
- **George Mason University, Fairfax, VA Bachelor of Science in Nursing**

Disclosure

“I have no relevant or material financial interests that relate to the topics discussed in this presentation.”

PAIN



"Allrighty now...can you tell me what level your pain is at right now?...Mr. Stimson?... Well, I'll just put down three."

... An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. - World Health Organization



- Acute pain is one of the most commonly cited reasons for ED visits and one of the most prevalent reports of the trauma patient



- Despite being the most common report in the emergency department pain is commonly undertreated
- Treatment of pain must be balanced with traumatic complications
- Patients who are physiologically unstable tend to have their pain treated less readily



Assessing Pain

- Assess using an appropriate tool: (Numeric, Verbal Rating Scale, Face Scale, CPOT)
- Is the patient functionally limited by pain?
- Are there any psychosocial issues affecting their pain?
- What are your patient's pain expectations?



Effective Pain Management

- Validate your patient's concerns about their pain
- Reassure your patient that you are there to help
- Gather information
- Discuss what you are doing to help
- Formulate a plan for pain management together if possible and repeat the plan back to your patient for clarification



Effective Pain Management

- Choose a treatment that will adequately relieve the pain based on your pain assessment and information that your patient shares with you
- Consider side effects, risk vs. benefit of your treatment
- Provide effective and timely analgesia
- Reassess your patient after the intervention



'Oh dear! Oh dear! I shall be late!'

Providing timely and effective pain management benefits:

- ❖ Encourages early mobilization and healing
- ❖ Reduces stress response
- ❖ Shorter length of stay
- ❖ Reduces the risk of developing chronic pain
- ❖ Reduces morbidity and mortality



Multimodal Therapy

- The use of more than one method or modality of controlling pain to obtain additive benefits, reduce side effects or both
- Commonly utilized medications
 - Opioids
 - NMDA receptor antagonists - Ketamine
 - Local anesthetics
 - NSAIDS
 - Acetaminophen
 - Muscle relaxants and anxiolytics
 - Anticonvulsants
 - Antidepressants



Opioids

- Side effects/concerns
 - Respiratory depression
 - Hypotension
 - Constipation
- Minimize opioids in order to minimize side effects while providing adequate pain relief
- Maintain a scheduled daily bowel regimen to minimize constipation



	Onset of Action	Peak Effect	Duration
Fentanyl IV	1 minute	3-5 minutes	30 - 60 minutes
Morphine IV	4-6 minutes	10-20 minutes	2-4 hours
Hydromorphone IV	4-6 minutes	8-15 minutes	2-4 hours
Oxycodone PO	15-60 minutes	1 hour	4-6 hours
Morphine IR (PO)	15-60 minutes	60 minutes	4-5 hours
Morphine ER (PO)	unknown	3-4 hours	8-24 hours
Hydromorphone PO	30 minutes	1 hour	4-6 hours
Methadone	30-60 minutes	1-2 hours	24-36 hours
Fentanyl TD	6-12 hours	12-24 hours	48-72 hours



Fentanyl

- Fast acting
- Short duration of analgesic activity
- Lack of emetic activity
- Minimal hypotensive activity
- Histamine release rarely occurs
- A 100 mcg IV bolus is equivalent to 10mg of IV morphine



Morphine

- Mu-opioid receptor agonist
- May be given IV, IM, SubQ, PO, PR and epidurally
- IV Dosing: 0.05 -0.1mg/kg
- Calculate the Morphine milligram equivalents (MME)/day that you are prescribing



Hydromorphone

- IV dose for severe pain is approx 0.015mg/kg
- Onset in 4-6 minutes with duration of action approximately 2 hours
- Can be converted easily to oral dosing



Recommended PCA Dosing

DRUG	BOLUS DOSE	LOCKOUT
hydromorphone	0.2mg	Q 10 minutes
morphine	1mg	Q 8 minutes
fentanyl	10mcg	Q 6 minutes

Transitioning off of PCA

- Pt should tolerate a PO diet
- Calculate the 24 hour total use
- Transition to PO equivalent dosing
- Reduce the dose by 30-50%
- Give first dose of PO medication, ensure that patient tolerates the dose and DC PCA
- May allow for an IV rescue dose for breakthrough pain as needed
- Adjust oral dosing as needed

Calculating Your PO Dose

- Calculate your PO Morphine equianalgesic dose
 - Morphine 10 mg IV = 30 mg PO (chronic), 60 mg PO (acute)
 - Hydromorphone 1.5 mg IV = 10 mg PO Morphine
 - Fentanyl 100 mcg IV = 10 mg PO Morphine
- Transition your PO Morphine dose to your desired treatment
- Morphine 10mg = Oxycodone 20 mg PO = Hydromorphone 7.5mg PO
- Do not forget your dose reduction when you rotate your opioids
- There are some nice dose calculation apps too!



Equianalgesic Opioid Dosing

Fentanyl 100 mcg IV =

Morphine 10 mg IV =

Hydromorphone 1.5 mg IV =

Oxycodone 20 mg PO =

Tapentadol 100 mg PO =

Morphine Sulfate ER 30 mg PO



Naloxone



- Alterations in respiratory rate and alveolar ventilation associated with narcotics may last longer than the analgesic effect
- Any patient who has an order for an opioid should also have a PRN naloxone order
- Naloxone 0.4mg IV Q 2-3 minutes or intranasal 1mg in each nostril with an atomization device, may repeat in 3-5 minutes
- May need to repeat in 1-2 hours if symptoms recur



Naloxone

- The CDC recommends that clinicians incorporate into their management plans, strategies to mitigate risk including offering naloxone when patients are on ≥ 50 MME/day
- From 2004-2009, patients who died of opioid overdose were prescribed an average of 98 MME/day
- Know your state laws on naloxone use outside of the hospital
- In Washington, D.C. opioid related deaths have nearly tripled in the past 2 years
- Residents can purchase naloxone at a pharmacy without a prescription from the pharmacist



Ketamine



Ketamine

- NMDA receptor antagonist that provides analgesia, preventing central sensitization and “wind up”
- 50-100 mg IM Q 30 minutes for severe traumatic pain, onset in 3-4 minutes, duration 12- 25 minutes
- Peak action with IV push is at 5-15 minutes, onset within 30 seconds
- Continuous IV infusion rate of 0.25 - 0.5mg/kg/hr



Ketamine

- Metabolized extensively in the liver
- It has minimal effect on the respiratory drive and causes bronchodilation
- It can help prevent opioid induced hyperalgesia
- Has anti proinflammatory effects
- Ketamine has been associated with improved blood pressure for patients with severe injuries - monitor cardiac patients closely



Ketamine

- Produces a dissociative state
- Nystagmus
- May also cause increased ICP
- Hallucinations and vivid dreams - incidence of psychological manifestations can be reduced by also giving a benzodiazepine



Local Anesthetics/Nerve Blocks

- Typically placed in the awake patient with local anesthetic with ultrasound guidance
- Ideal for the patient to be NPO 6-8 hours prior to the procedure
- Follow ASRA guidelines for anticoagulation, hold heparin 4-6 hours prior to the procedure, lovenox should be held for 10-12 hours
- NYSORA, MARAA handbook



Local Anesthetics/Nerve Blocks

- Single injection vs. continuous catheter placement
- Compartment syndrome - does a nerve block delay diagnosis
- A catheter may remain in place for up to 7 days, longer if it is tunneled
- The patient may go home with a portable pump that infused a local anesthetic and they remove the catheter at home

Thoracic Paravertebral Nerve Block

- Unilateral block of the spinal nerve involving injection of local anesthetic in the paravertebral space
- Performed as a single injection or catheters may be left in place that will continuously infuse local anesthetic
- Bupivacaine and Ropivacaine commonly used with a 2-3 mg/kg initial bolus dose
- Continuous infusion of ropivacaine 0.2% at total of 10-12 ml/hr



Femoral and Fascia Iliaca Nerve Blocks

- Successfully controls pain in hip fracture patients
- Minimizes or eliminates need for opioid pain medication
- Facilitates earlier mobilization

Transversus Abdominis Plane (TAP) Block

- Target the spinal nerves, depositing local anesthetic between the internal oblique and the transversus abdominis muscles
- Will provide pain relief to the skin of the abdomen, muscle and parietal peritoneum
- Patient will still experience dull visceral pain
- Patient is able to mobilize quickly, deep breath and cough

NSAIDS

➤ Ketorolac

- May be given IV and IM
- 15-30mg IV Q6hrs
- In patients 65 years and older or patients less than 50kg give the lower dose of 15mg
- Contraindicated in patients with advanced renal impairment
- There may be cross sensitivity in patients with sulfa allergies

celecoxib

➤ Cox-2 inhibitor

- May start with a 400 mg PO dose x 1 dose
- 8 hours after the loading dose, start 200 mg BID
- Effective in the treatment of pain due to musculoskeletal injury
- Less risk of bleeding and fewer GI side effects than with Ibuprofen



Acetaminophen

- Oral dosing
 - 1 Gram every 6 hours
- May be given IV
 - 1 Gram every 6 hours
- Use caution with liver injuries, known liver impairment or active disease
- Max 24 hour dose should not exceed 4 Grams



Anticonvulsants To Treat Nerve Pain

- Neuropathic pain is common in the trauma patient and contributes to reduced quality of life and decreased functional ability
- gabapentin- 100-300 mg PO TID
- pregabalin - 75 mg PO BID
- Increase doses gradually and taper over at least one week to DC



Antidepressants

- Several have shown to be efficacious for chronic neuropathic pain
 - Tricyclic Antidepressants (TCAs)
 - amitriptyline 25mg PO QHS
 - nortriptyline 25-50 mg PO QHS
 - SSNRIs
 - duloxetine 60 mg PO once daily
 - Venlafaxine 37.5mg PO once daily



Nonpharmacologic Treatment

- Rest
- Ice
- Compression
- Elevation
- Heat
- Physical therapy - exercise to regain strength and improve range of motion
- Distraction - watch TV, read, listen to music, family/friend support

Complementary and Alternative Medicine (CAM)

- Reiki
- Virtual Reality
- Pet Therapy
- Music Therapy



Discharge and Follow Up

- Coordinate with your patient's established chronic pain provider or addiction treatment program if necessary
 - What medications will your patient be sent home with and how much
 - Provide information on medications that were given during your patient's stay that may interfere with drug screening
 - Ensure there is seamless transition and follow up care scheduled

Discharge and Follow-Up

- Please make sure that your trauma patients have access to a chronic pain specialist on an outpatient basis
 - Assist in preventing chronic pain
 - Reduce the severity and duration of the pain experience
 - Decrease opioid misuse and opioid related death
 - Assist with weaning off of opioids safely when appropriate

Contact Me!

Renee Theisen, FNP, BC

George Washington University Hospital

Acute Pain Management Service

rtheisen@mfa.gwu.edu