Postoperative Pain Management after Spine Surgery
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Under Treatment of Postoperative Pain
• Delay in recovery and discharge
• Up to 70% still complain of moderate to severe postop pain (some have found even higher degrees of pain)
• Poorly controlled pain leads to increased catabolism, increased cardio/respiratory work; immunosuppression; coag disturbances – ileus, urinary retention, poor mobility......
• PONV prolongs recovery and contributes to unexpected admissions from outpatient procedures
• Leads to poor patient satisfaction; impaired quality of recovery and increased health care costs


Unplanned 30 day re-admissions for spine surgery pain issues second most common reason for re-admit. (22.4%)

AND – has patient perception improved over the last 20 years?
The Goals
- Improve the patients pain
- Without side effects
- Avoid risk of development of chronic pain
- Improve functional outcomes
- Moving them toward discharge
- Improve patient satisfaction

Easy, right?

Multimodal Pain Management
- Improve pain with less side effects by targeting a variety of chemical and neurophysiological pain pathways
- Decreasing postop pain while decreasing opioid use


Peripheral Sensitization
- Tissue injury leads to inflammatory response
- Activation of a cascade of events leading to peripheral and central sensitization of nociceptive pathways
- Peripheral sensitization from various substances from injured cells, nociceptors, enhanced capillary permeability and generation by local enzyme activity
- Leads to Acute Pain

Central Mechanisms
- Peripheral sensitization can enhance the pain responses in the CNS
- Facilitates nociceptive transmission
- Release of mediators within dorsal horn
- Neural plasticity changes with central sensitization
- Leads to persistent postop or chronic pain

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**Pre-emptive analgesia**

- Pre-treatment results in diminished future pain
- "Protect" the nervous system from sensitization
- **Avoid** "spinal wind up"
  - Peripheral sensitization – a reduction in the threshold of nociceptor afferent peripheral terminals – a result of inflammation at surgery site
  - Central sensitization – barrage persistent exposure of primary afferent nociceptors to dorsal horn
  - Together – lead to post op hypersensitivity state – "spinal wind up"
  - Responsible for decreased pain threshold

**Multimodal Pain Management**

- Improve pain with less side effects by targeting a variety of chemical and neurophysiological pain pathways
- **Decreasing postop pain while decreasing opioid use**


**L4-5 fusion -80pts**

Control: IV morphine
Study: Preop celecoxib, pregabalin, oxycodone ER, acetaminophen (and BID postop/celecoxib qd)

Postop: VAS, ODI, EGL, postop drain output, nonunion rates

VAS stat sig lower at all time points (PACU, 8h, Day 1, 2, 4, 7)

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- **Significant decrease in postop pain at both 0-4 and 20-24 hrs post op**
- **Significant decrease in postoperative analgesic usage post op**
- No differences in nausea, vomiting, dizziness/lightheadedness
- Gabapentin group **DID** have significantly higher incidence of sedation
- **600 mg best balance between pain relief and sedation.**


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- 23 studies
- 1529 patients
- Periop use of gabapentin had a significant 24 hour opioid sparing effect and improves pain scores for both abdominal hysterectomy and spine surgery


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- 90 patients
- Prospective; randomly assigned
  - Pregabalin 150mg; gabapentin 600mg; placebo
  - Q12hr – 2 times pre and 2 times post op.
  - Pregabalin and gabapentin groups with significantly less morphine consumption; preop anxiety, pruritis, postop shivering, increase patient satisfaction.

• Compared a pre intervention group (44 pts) with post intervention group (41 pts).
• "intervention" included: acetaminophen, NSAIDs, gabapentin, Ketamine, dex, ondansetron, epidural local infusion or PCA.
• Less opioid on POD 1 and 2, mobilized and ambulated sooner. Less N/V, sedation and dizziness.


• 100 pts pre intervention & 100 pts post intervention
• Intervention:
  • Preop: gabapentin(600mg), long acting oxycodone (10-20mg); acetaminophen (1,000mg).
  • Postop: gabapentin (600mg TID); long (10-20mg BID) and short acting oxycodone(5-20mg q 3 hours); acetaminophen (1,000mg TID)
• Adjusted for age, hepatic disorders, opioid or lack of opioid history


• Significantly less opioid consumption (p<0.001)
• Lower ratings of least pain (p<0.01)
• Less nausea (p<0.001)
• Less drowsiness (p<0.05)
• Less interference with walking (p<0.05)
• Less interference with coughing/deep breathing (p<0.05)


• Idiopathic scoliosis patients
• 30 Placebo, 29 study
• Preop: 15mg/kg gabapentin/placebo
• Post Op: PCA + 5mg/kg/placebo TID
• Significantly lower pain scores and morphine consumption in PACU, POD#1 & #2
• No decrease in Opioid SE

Answers Needed….. Optimal postoperative pain protocols – algorithms – pathways
• Multi disciplinary effort
• Institution support
• Is a basic patient expectation


Each Patient
Requires ongoing monitoring
Requires constant adjustments
Nursing understanding and critical decision making is key
Conclusions

• Acute pain is a big problem and if not adequately treated, can lead to chronic pain
• Multimodal pain management includes pre-emptive analgesia
• Pre-emptive analgesia can prevent "spinal wind-up" and thus central sensitization that can lead to chronic pain
• Multimodal oral pain management has been proven effective in the post operative spine patient population
• Endless opportunities to help our patients, answer questions, give clinicians a guide

Thank you!

• Mathiesen, O., Moiniche, S. & Dahl, J. (2007). Gabapentin and postoperative pain: a qualitative and quantitative systematic review, with focus on procedure. BMC Anesthesiology, 7(6)