Post-operative Pain

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Goals:

- Understand the importance of treating pain as it relates to post-op recovery
- Become acquainted with various pain pathways
- Describe the use/pros/cons of 3 major post op analgesic modalities
53 year old female with pmhx of Diabetes, Coronary Artery Disease s/p Coronary Artery Bypass Graft, Obstructive Sleep Apnea on CPAP, Hypertension and Ovarian Cancer who presents for open hysterectomy, Bilateral Salpingoopherectomy, debulking and staging.
## Why Treat Pain?

<table>
<thead>
<tr>
<th>System</th>
<th>Condition</th>
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<tbody>
<tr>
<td>CV:</td>
<td>Tachycardia, hypertension, and increase in cardiac work load</td>
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<tr>
<td>Pulm:</td>
<td>Respiratory muscle spasm (splinting), decrease in vital capacity, atelectasis, hypoxia, and increased risk of pulmonary infection</td>
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<td>GI:</td>
<td>Postoperative ileus</td>
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<tr>
<td>Renal:</td>
<td>Increased risk of oliguria and urinary retention</td>
</tr>
<tr>
<td>Coag:</td>
<td>Increased risk of thromboemboli</td>
</tr>
<tr>
<td>Immun:</td>
<td>Impaired immune function</td>
</tr>
<tr>
<td>Muscular:</td>
<td>Muscle weakness and fatigue. Limited mobility can increase the risk of thromboembolism</td>
</tr>
</tbody>
</table>

Looking at the table above how would NOT treating her pain affect her? Remember she has DM, HTN, CAD s/p CABG and OSA.

Anatomy & Physiology of Pain
Many different ion channels and chemical mediators involved in pain sensation

Methods of Analgesia

- Opioids
- Non-Opioids
- Local Anesthetics

- Goal of treatment: balance satisfactory analgesia and ability to promote recovery and rehabilitation
- Modality of pain txt will also vary with surgical procedure and patient characteristics
Opioids

- Conventional vs IV PCA
- PCA: infusion pump that enable pt to deliver doses of analgesic drugs
  - Pro:
    - As opposed to prn opioids trough and peaks are less severe with IV PCA
    - Analgesic level is better matched to analgesic need
    - pts have autonomy over pain control.
Opiods continued...

- Con: May lead to pruritis, ileus, sedation, respiratory depression

- May not cover all major surgical pain, but may provide additive effect"

Given these facts and our pt’s pre-existing health problems, how would giving our patient opiods affect her post op course?
Non-Opioids

- Ex: NSAIDS (Cox1-2), Ketamine (NMDA), Para-aminophenol (Cox-3), Clonidine, Precedex (alpha$_2$ agonist)

- **Pro:**
  - When given in combo with opioids NSAIDS result in better pain relief decrease opioid consumption
  - Incidence of respiratory depression reduced
  - Incidence of post-op N/V decreased, improved mobility, earlier bowel function

- **Con:**
  - Not 1$^{st}$ line analgesia for major surgery bc can’t provide effective pain relief
  - May affect platelet fxn, alters renal function, peptic ulceration

How would this modality affect our patient?
Local Anesthetics

- Ex: epidural and regional block catheters
  - epidural: low dose infusion of local anesthetic into the epidural space
  - block: local anesthetic around specific nerve fascicle

- Pro:
  - Decreases opioid requirement
  - Beneficial effects on bowel mobility
  - ↓ rehab time, ↓ pulm morbidity, ↓ time to extubation of trachea, major thoracic, vascular dysfunction, ↓ cardiac ischemia in high risk pts, ↓ hospital stay

- Con:
  - Requires a higher level of technical mastery for placement
  - Very small potential for nerve damage, infection, bleeding

Given these facts how would giving our patient local anesthetic ie epidural affect her post op course?

Barash, P. Clinical Anesthesia, 2009 1475-1479
What Would You Do?

- Given these three types of analgesic options, which analgesic modality would you use to treat our patient’s post-op pain? Remember, combinations are allowed!
# Summary:

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Opioids</th>
<th>Non-Opioids</th>
<th>Local Anesthetic</th>
</tr>
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<tbody>
<tr>
<td>Mu receptor agonist</td>
<td>Cox1-2, NMDA, Cox-3, alpha&lt;sub&gt;2&lt;/sub&gt; agonist</td>
<td>Block Sodium channels preventing nerve conduction</td>
<td></td>
</tr>
</tbody>
</table>

- **Pro:**
  - Less peak and troughs
  - Analgesia level matched to need
  - Autonomy of pain control
  - ↓ N/V, respiratory depression
  - ↓ rehab time, ↓ pulm morbidity, ↓ time to extubation of trachea, major thoracic, vascular dysfunction, ↓ cardiac ischemia in high risk pts, ↓ hospital stay

- **Con:**
  - Respiratory depression
  - Pruritis
  - Ileus
  - Ineffective as sole analgesic
  - Can affect renal, hepatic function

- **Technique:** Bleeding Trauma