Pharmacologic Management of Pain
as the pendulum swings...

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How did we get here?

Validated screening tools
Limitations with current recommendations
Abuse and addiction
Treatment strategies

The 5th Vital Sign…or is it?

"Just as we now know (the) earth is not flat, we know that pain is not a vital sign. Let's remove that from the lexicon."
- James Milam, MD, an American Medical Association delegate

“I am astounded that physicians don’t believe we should assess pain on a regular and ongoing basis. That is exactly what removing pain as a vital sign means.”
- Lynn Webster, MD, past president of the American Academy of Pain Medicine

American Medical Association Stance

• Dropped pain as the 5th vital sign in 2016
• Adopted similar policies as Physicians for Responsible Opioid Prescribing (PROP)
• Lobbying the Joint Commission to weaken its pain management standards

Joint Commission Stance

• Current standards require that organizations establish policies regarding pain assessment and treatment and conduct educational efforts to ensure compliance.
• The standards DO NOT require the use of drugs to manage a patient’s pain nor specify which drug should be prescribed.
### Joint Commission Standards

- The hospital educates all licensed independent practitioners on assessing and managing pain.
- The hospital respects the patient’s right to pain management.
- The hospital assesses and manages the patient’s pain.

[https://www.jointcommission.org/joint_commission_statement_on_pain_management/](https://www.jointcommission.org/joint_commission_statement_on_pain_management/)

### Joint Commission Policy Requirements

- Conducts a comprehensive pain assessment
- Uses methods to assess pain that are consistent with the patient’s age, condition, and ability to understand
- Reassesses and responds to the patient’s pain, based on its reassessment criteria
- Treats the patient’s pain or refers the patient for treatment

[https://www.jointcommission.org/joint_commission_statement_on_pain_management/](https://www.jointcommission.org/joint_commission_statement_on_pain_management/)

### What are validated tools for screening and assessing pain?

<table>
<thead>
<tr>
<th>Tool Characteristics</th>
<th>Administration</th>
<th>Time to Complete</th>
<th>Length</th>
<th>Access Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessing Function and Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-Dimensional Pain Scale</td>
<td>Chiropractor or patient self-report</td>
<td>2 items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk of Translating to Chronic Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Recovery Questionnaire (FRQ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiropractor or patient self-report</td>
<td>6 items</td>
<td>Requires enrolment registration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scoring for Risk of Opioid Addiction and Substance Abuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>Onsite or self-report</td>
<td>1 minute</td>
<td>3 functional questions</td>
<td></td>
</tr>
<tr>
<td>VAS (Visual Analog Scale)</td>
<td>Chiropractor</td>
<td>15 minutes</td>
<td>2 functional questions</td>
<td></td>
</tr>
<tr>
<td>Functional Assessment and Opioid Use for Patients with Pain and Opioid-Dependent Addiction</td>
<td>Patient self-report</td>
<td>30 minutes</td>
<td>Requires licensing agreement</td>
<td></td>
</tr>
<tr>
<td>Opioid Use Disorder - Identification Tool (AUDIT-C)</td>
<td>Patient self-report</td>
<td>90 minutes</td>
<td>17 items</td>
<td>Requires licensing agreement</td>
</tr>
<tr>
<td>Screening for Mental Health Disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Health Questionnaire 2 (PHQ-2)</td>
<td>Patient self-report</td>
<td>6 minutes</td>
<td>10 items</td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 items</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Additional tools and resources are available online. Further validation studies and prospective outcome studies are needed to examine the use of these tools and evaluate their effectiveness. For more information, visit [http://www.agencydirectors.wa.gov/Files/2015AMDGOpioidGuideline.pdf](http://www.agencydirectors.wa.gov/Files/2015AMDGOpioidGuideline.pdf).
PEG Pain Screening Tool

1. What number best describes your pain on average in the past week?
   - 0 = No pain
   - 10 = Pain as bad as you can imagine
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

2. What number best describes how, during the past week, pain has interfered with your enjoyment of life?
   - 0 = Does not interfere
   - 10 = Completely interferes
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What number best describes how, during the past week, pain has interfered with your general activity?
   - 0 = Does not interfere
   - 10 = Completely interferes
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To compute the PEG score, add the three responses to the questions above, then divide by three to get a final score out of 10.

The final PEG score can mean very different things to different patients. The PEG score, like most other screening instruments, is most useful in tracking changes over time. The PEG score should decrease over time after therapy has begun.


Two Item Chronic Pain Scale

Graded chronic pain scale: a two-item tool to assess pain intensity and pain interference

In the last month, on average, how would you rate your pain? Use a scale from 0 to 10, where 0 is "no pain" and 10 is "pain as bad as could be." [That is, your usual pain at times you were in pain.]

<table>
<thead>
<tr>
<th>No pain</th>
<th>Pain as bad as could be</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>

In the last month, how much has pain interfered with your daily activities? Use a scale from 0 to 10, where 0 is "no interference" and 10 is "unable to carry on any activities."

<table>
<thead>
<tr>
<th>No interference</th>
<th>Unable to carry on any activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>


Patient Case

• JM is a 53 y.o male recently discharged from the hospital following a ventral hernia repair.
• PMH: HLD, COPD, DM, and chronic low back pain
• Home medications:
  - atorvastatin 40 mg PO daily
  - tiotropium bromide inhaler 1 puff daily,
  - albuterol/ipratropium inhaler 1 puff every 6 h as needed
  - aspirin 81 mg PO daily
  - metformin 500 mg PO BID
  - morphine SR 30 mg PO BID
• Discharge Rx’s:
  - morphine SR increased to 45 mg PO BID (#60)
  - oxycodone 10 mg PO q 6 h as needed for breakthrough pain (#60)

What are the best treatment strategies for patients?
Pain

• Definition:
  – Physical suffering or discomfort caused by illness or injury

• Types:
  – Somatic – skin, tissue, muscle pain
    • sharp, stabbing
  – Visceral – internal organ pain
    • ache, pressure
  – Neuropathic – nerve/nerve fiber damage or dysfunction
    • burning, tingling

Non-Opioid Analgesics

NSAIDs
Acetaminophen
Corticosteroids

NSAIDS

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>• Inhibition of cyclooxygenase (COX) which reduces prostaglandin synthesis • Anti-inflammatory and anti-pyretic actions • Non-selective vs. COX-2 selective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications in class</td>
<td>• Non-selective: ibuprofen, naproxen, aspirin, ketoprofen, indomethacin, ketorolac • COX-2 selective: celecoxib, meloxicam, diclofenac, etodolac</td>
</tr>
<tr>
<td>Types of pain</td>
<td>• Somatic/visceral: low to moderate pain, inflammatory processes, musculoskeletal</td>
</tr>
<tr>
<td>Precautions</td>
<td>• Cardiovascular disease • Risk of GI bleeding and/or ulceration • Caution in those with impaired renal function and the elderly</td>
</tr>
<tr>
<td>Relative cost</td>
<td>AWP: &lt;$10 to &gt;$220 for a 30 day supply</td>
</tr>
</tbody>
</table>

Acetaminophen (APAP)

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>• Not fully understood • Centrally acting analgesic which inhibits PG synthesis; works peripherally to block generation of nerve impulses • Anti-pyretic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of pain</td>
<td>• Somatic/visceral, mild to moderate pain</td>
</tr>
<tr>
<td>Precautions</td>
<td>• Hepatotoxicity concerns (max. daily dose: 4 g) • Hepatic impairment • Alcohol use (≥3 servings of alcohol per day)</td>
</tr>
<tr>
<td>Relative cost</td>
<td>AWP: &lt; $10 for a 30 day supply</td>
</tr>
</tbody>
</table>
Corticosteroids

- Mechanism:
  - Indirect analgesia via reduction in inflammation
- Medications in class: prednisone, dexamethasone, hydrocortisone, methylprednisolone etc.
- Type of pain: somatic/visceral due to inflammation
- Precautions:
  - Avoid long term use
  - Adrenal suppression
  - Hyperglycemia and hypertension
  - Immunosuppression
- Relative cost: AWP: <$20 for a 30 day supply

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Corticosteroid Conversion

<table>
<thead>
<tr>
<th>Glucocorticoid</th>
<th>Approximate Equivalent Dose (mg)</th>
<th>Half-life (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-Acting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cortisone</td>
<td>25</td>
<td>8-12</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>20</td>
<td>8-12</td>
</tr>
<tr>
<td><strong>Intermediate-Acting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>4</td>
<td>18-36</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>5</td>
<td>18-36</td>
</tr>
<tr>
<td>Prednisone</td>
<td>5</td>
<td>18-36</td>
</tr>
<tr>
<td>Triamcinolone</td>
<td>4</td>
<td>18-36</td>
</tr>
<tr>
<td><strong>Long-Acting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bemethasone</td>
<td>0.5 – 0.75</td>
<td>36-54</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>0.75</td>
<td>36-54</td>
</tr>
</tbody>
</table>

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Opioid Analgesics

- Mechanism:
  - mu-opioid receptor agonist
  - Inhibition of ascending pain pathways, alters perception to pain
- Medications in class:
  - Morphine, hydromorphone, fentanyl, buprenorphine, oxycodone, oxymorphone, hydrocodone, tramadol, tapentadol, codeine
- Types of pain: somatic/visceral/neuropathic pain
- Precautions:
  - High abuse potential
  - CNS depression
  - Respiratory depression
  - Constipation
- Relative cost: Variable, but relatively inexpensive if prescribed generic

---

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  - Respiratory depression
  - Constipation
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### Opioid Conversion

<table>
<thead>
<tr>
<th>Drug</th>
<th>Oral dose (mg)</th>
<th>Parenteral dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>7.5-8</td>
<td>1.5-2</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>20-30</td>
<td>-</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>30-45</td>
<td>-</td>
</tr>
<tr>
<td>Codeine</td>
<td>100-130</td>
<td>200</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>0.1 (100 mcg)</td>
<td>-</td>
</tr>
</tbody>
</table>


### Alternative Agents

**Anticonvulsants**
- Gabapentin
- Pregabalin
- Carbamazepine
- Lamotrigine

**Antidepressants**
- Tricyclic
- Antidepressants
- SSRIs/SNRIs

### Calcium Channel Blockers

**Mechanism**
- Binds to calcium channels in the CNS which modulates release of neurotransmitters that have a role in analgesia

**Medications in class**
- Gabapentin (Neurontin, Gralise)
- Pregabalin (Lyrica)

**Types of pain**
- Neuropathic pain (diabetic neuropathy, postherpetic neuralgia, etc.)
- Pregabalin approved for fibromyalgia

**Precautions**
- Abuse potential
- CNS depression
- Dose reduction needed in renal impairment
- Should not be abruptly discontinued

**Relative cost**
- AWP: <$50 to >$600 for a 30 day supply


### Sodium Channel Inhibitors

**Mechanism**
- Inhibits Na channels and stabilizes neuronal membranes
- Lamotrigine also inhibits release of glutamate

**Medications in class**
- Carbamazepine
- Lamotrigine

**Types of pain**
- Neuropathic pain
- Carbamazepine is first-line for Trigeminal Neuralgia

**Contraindication**
- Initiation within 14 days of MAOI use

**Precautions**
- Induction of liver enzymes (carbamazepine) → drug interactions
- Carbamazepine: use with caution in CVD
- Renal and hepatic impairment
- Blood dyscrasias

**Relative cost**
- AWP: >$100 for 30 day supply


### Other Analgesic Therapies

#### Skeletal Muscle Relaxants

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Baclofen - hyperpolarization of primary afferent fiber terminals → reduction of muscle spasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications in class</td>
<td>Baclofen · Cyclobenzaprine</td>
</tr>
<tr>
<td>Types of pain</td>
<td>Muscle spasms/spasticity</td>
</tr>
<tr>
<td>Precautions</td>
<td>Avoid abrupt discontinuation (baclofen)</td>
</tr>
<tr>
<td>Relative cost</td>
<td>AWP: $80 - $100 for 30 day supply</td>
</tr>
</tbody>
</table>

#### Topical Analgesic Agents

### Tricyclic Antidepressants (TCAs)

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Inhibits reuptake of serotonin and norepinephrine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications in class</td>
<td>Amitriptyline · Nortriptyline · Imipramine/desipramine</td>
</tr>
<tr>
<td>Types of pain</td>
<td>Neuropathic pain · Fibromyalgia · Diabetic neuropathy</td>
</tr>
<tr>
<td>Precautions</td>
<td>Increased risk of suicidal thoughts/behavior · Caution in elderly – anticholinergic side effects</td>
</tr>
<tr>
<td>Relative cost</td>
<td>AWP: $10 - $50 for 30 day supply</td>
</tr>
</tbody>
</table>

### Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Inhibits reuptake of serotonin and norepinephrine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications in class</td>
<td>Duloxetine · Venlafaxine</td>
</tr>
<tr>
<td>Types of pain</td>
<td>Neuropathic pain · Fibromyalgia</td>
</tr>
<tr>
<td>Precautions</td>
<td>Increased risk of suicidal thoughts/behavior · Increased risk of bleeding · Hypertension</td>
</tr>
<tr>
<td>Relative cost</td>
<td>AWP: $100 - $200 for 30 day supply</td>
</tr>
</tbody>
</table>
**Topical Analgesic Agents**

- **Capsaicin**
  - **Mechanism:**
    - Activates TRPV1 receptor → depolarization of neuron → inhibition of nociceptive nerve transmission
    - Depletion of substance P
  - **Types of pain:** neuropathic, muscle/joint pain
  - **Onset of action:** 2-4 weeks
- **Lidocaine**
  - **Mechanism:**
    - Inhibition of the conduction of the nerve impulse
  - **Types of pain:** localized pain, somatic/neuropathic

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**Patient Case**

- JM had a follow-up appointment on POD 14 with his surgeon who refused to refill his Rx for oxycodone
- JM is still complaining of pain and scheduled an appointment with his PCP
- Was JM’s pain treated appropriately upon discharge?

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**Patient Case**

- JM had major abdominal surgery
  - Benefits exist with narcotic-sparing analgesia
  - Target musculoskeletal pain control
  - Opioid side effects lead to poorer outcomes and patient satisfaction
- Multimodal treatment approach
  - Ibuprofen 600 mg – 800 mg PO q 6 h scheduled
  - Acetaminophen 500 mg – 1000 mg PO q 6 h scheduled
  - Gabapentin 300 mg PO TID scheduled
  - Attempt to wean morphine SR back to 30 mg PO BID
  - Non-pharmacologic– PT, acupuncture, mindfulness, meditation

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**What should be considered treatment success?**

- Reduction in pain AND increase in functionality
  - 30% improvement in pain and function has been considered clinically meaningful in low back pain patients
  - 35-45% decrease in acute post-operative pain was associated with reported acceptable improvement to patients

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How can we recognize and prevent opioid addiction?

[Image: https://www.palorecovery.com/heroin-heartland-60-minutes-special]

Thoughts Over Time

• 1940 – 1980’s – Opioids cause addiction
• 1990’s – 2000’s – Pain is complex and multifactorial; opioids are good for some types of pain
• 2016 – Opioids cause addiction

[Source: Journal of Palliative Medicine. 2016(19)4. DOI: 10.1089/jpm.2016.0079]

Know the Facts

• In 2014, more than 262 million opioid doses were dispensed in Ohio for the management of acute pain
• Prescription opioids remain a significant factor in unintentional overdose deaths in Ohio


Heroin

• Semisynthetic opioid derived from opium poppy
  – Mu opioid receptor agonist which bind to opioid receptors in the CNS
  – Kappa and delta - type activity
• Routes of administrations:
  – Snorted
  – Intravenous injection
  – Smoked/inhaled

As heroin use has increased, so have heroin-related overdose deaths:

- Quadrupled since 2010
- Increased by 20.6% from 2014 - 2015, with nearly 13,000 people dying in 2015
- Laced with carfentanil

Ohio’s Approach to Fight Drug Abuse

- Cutting the pill supply
- Preventing drug abuse before it starts
  - Start Talking!
- Providing treatment and recovery support to those in need
- Saving lives through naloxone

Ohio Automated Rx Reporting System (OARRS)

- Created by Ohio Board of Pharmacy in 2006
- Access available for all prescribers and pharmacists
- Information on all outpatient controlled substance prescriptions
- Data reported every 24 hours and is maintained in a secure database
- Tools used to address drug diversion and abuse
  - Patient care tool
  - Drug epidemic early warning system
  - Drug diversion and insurance fraud investigative tool

Governor’s Cabinet Opiate Action Team (GCOAT)

- Part of Ohio’s effort to curb misuse and abuse of prescription pain medications and unintentional overdoses
  - Prescribing guidelines for outpatient management of acute pain (2016)
  - Prescribing guidelines for chronic pain > 12 weeks (2013)
  - Prescribing guidelines for emergency departments and acute care facilities (2012)
GCOAT Actions – Positive Effect

- Prescriber/pharmacist queries using OARRS increased from 778,000 in 2010 to 9.3 million in 2014
- Opioid doses dispensed to Ohio patients decreased by 42 million from 2012 to 2014
- Ohio patients receiving prescriptions for opioids and benzodiazepines at the same time dropped 8% from 2013 to 2015
Acute Pain Prescribing Guidelines
(outside of Emergency Departments)
These guidelines are to be used as a clinical tool, but they do not replace clinician judgement.

Have “The Talk”
- Be honest about pain medication misuse
- Start with assessment
  - Pain level
  - Medication history
  - History of drug abuse (you/family/neighbors)
- Work together to create a safe treatment plan
- Discuss expectations

Chronic Pain Prescribing Guidelines
These guidelines are to be used as a clinical tool, but they do not replace clinician judgement.

Chronic pain: pain that persists after reasonable medical efforts have been made to relieve the pain or cure its cause and that has continued for > 3 months

“Trigger Point” = 80 mg MED’ (Ohio)

*The 80 mg MED is not an endorsement by any regulatory body or medical professional to utilize that dose or greater.
Chronic Pain Prescribing Guidelines

These guidelines are to be used as a clinical tool, but they do not replace clinician judgement.

- Non-opioid therapies first
- Avoid long-term and co-prescribing (benzo’s)
- Press pause to “trigger points”
- Ensure patient safety
  ✓ Informed consent
  ✓ Functional status (4 A’s)
    - ADL’s, ADE’s, Analgesia, Aberrant behavior
    - Progress toward treatment goals
    - OARRS as an additional check
    - Patient pain treatment agreement
    - Refer patient to pain specialist if needed
- Review Treatment Plan at “trigger point”
  - Assess addiction risk or mental health concerns

What are limitations to implementing current recommendations?

Limitations

- TIME
- Pain is and always will be objective
- Differing patient behaviors
- Hard to control outpatient setting
- Lack of resources

Be Part of the Change

Opioid pain relievers are responsible for more overdose deaths than cocaine and heroin combined.

Share this to help #EndMedicineAbuse.

https://nicolebailey.org/category/substance-abuse-prevention/