Acute Pain Management: Evaluating and Treating Acute Pain

Don Teater, MD, MPH

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The content of my material/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated: I will discuss the use of low-dose ketamine as one option for treatment of acute pain.

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Dr. Teater graduated from Ohio State University College of Medicine, Columbus, and completed his residency in family medicine in Fayetteville, North Carolina, at the Duke/FAHEC program. In 2017, he earned his Master of Public Health (MPH) degree at the University of North Carolina at Chapel Hill’s Gillings School of Global Public Health. In 2004, he began prescribing buprenorphine to treat opioid use disorder. From 2013 to 2016, he served as the medical adviser to the National Safety Council, leading its efforts to reduce problem use and overdose from opioid medications. Dr. Teater was lead facilitator for the expert panel during the development of the Centers for Disease Control and Prevention’s (CDC’s) Guideline for Prescribing Opioids for Chronic Pain. He continues to consult for the CDC and several states, educating prescribers on the appropriate treatment of pain and opioid use disorder. He sees patients one day a week by telemedicine, treating opioid use disorder and chronic pain.
Learning Objectives

1. Identify and use evidence-based criteria to diagnose acute pain conditions like low back pain, migraine headaches, neck pain, face pain, and acute postsurgical pain

2. Identify and use standardized/validated tools and algorithms to manage acute pain conditions

3. Identify and use standardized collaborative instruments to identifying “drug-seeking patients”.

4. Establish standards for acknowledging patient complaints of pain, including documentation, and treatment effectiveness evaluation.

5. Know and understand the entities of CPSP and acute postoperative pain and the modern principles of treating them using a standardized tool.

Audience Engagement System

Step 1

Step 2

Step 3
Common quote:

“Opioids are the most potent medications we have for treatment of pain.”


Facts

• 1 out of 16 people given a one-day rx for an opioid will become a long-term user – because of the prescription.\textsuperscript{47}
  – c/w 1/250 people who do not get an opioid rx.\textsuperscript{76}
• 1 out of 3 people on opioids for 30 days or more will become long-term users.\textsuperscript{47}
Our Prescribing:

- Medical providers in the U.S. in 2015 prescribed enough opioids for every man, woman and child to get 128 Vicodin tabs!\textsuperscript{48}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{usopioidstats.png}
\caption{U.S. opioid stats, 1999-2010.\textsuperscript{7}}
\end{figure}
We get very little education on:

1. The current science of pain and pain treatment.
2. Evidence on the efficacy and side effects of opioids.
Goals in **acute** pain treatment

1. Prevent chronic pain
2. Reduce suffering
3. Reduce pain

**Pain**

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

*International Association for the Study of Pain*
Pain

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

International Association for the Study of Pain
Pain

- Acute pain: Pain < 3 months
- Chronic pain: Pain > 3 months
- Acute pain is a *symptom*
- Chronic pain is a *disease*

4 common types of pain

- Nociceptive
- Neuropathic
- Central Sensitization
  - Also called:
    - Central pain
    - Neuropathic pain
- Opioid withdrawal
AES Question 1

How familiar are you with central sensitization?

A. Never heard of it or have no significant knowledge
B. I understand the basic concept
C. I have a good understanding of it
D. I can teach others about it

Pain pathways

- Nociceptor
- Spinothalamic nerve
- Thalamus
- Amygdala (fear)
- Hippocampus (memory)
- Somatosensory nerve (pain)
- Limbic system (emotion)
- Prefrontal cortex (rational thinking)
Central Sensitization

**Central sensitization Inventory**

1. I feel tired and overwhelmed when I wake from sleeping.  Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
2. My anxiety still won’t go away.  Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
3. I have anxiety attacks. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
4. I grit or clench my teeth. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
5. I have problems with digestion and/or constipation. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
6. I struggle with performing my daily activities. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
7. I am sensitive to bright lights. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
8. I get tired very easily when I am physically active. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
9. I feel pain all over my body. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
10. I have headaches. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
11. I feel discomfort in my bladder and/or bowels when I urinate. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
12. I do not sleep well. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
13. I have difficulty concentration. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
14. I have chronic pain or chronic pain, for example, headaches, or other. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
15. Stress makes my physical symptoms get worse. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
16. I feel sad or depressed. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
17. I have little energy. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
18. I have muscle tension in my neck and shoulders. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
19. I have pain in my jaw. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
20. Certain sounds, such as noises, will make me feel overwhelmed. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
21. I have a sudden temper tantrum. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
22. I have difficulty concentrating. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
23. I feel anger or frustration. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4
24. I feel pain in my pelvic area. Never = 0, Rarely = 1, Sometimes = 2, Often = 3, Always = 4

**Scoring key**

- **Never** = 0
- **Rarely** = 1
- **Sometimes** = 2
- **Often** = 3
- **Always** = 4

**Interpretation**

- **Subclinical** = 0 - 29
- **Mild** = 30 - 39
- **Moderate** = 40 - 49
- **Severe** = 50 - 59
- **Extreme** = 60 - 100
Lightness constancy

Pain Contributions

Normal acute pain

Chronic pain

Central Sensitization
Acute to chronic back pain in the workplace\textsuperscript{15,50}

<table>
<thead>
<tr>
<th>Patient-specific factors</th>
<th>Treatment factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety and/or depression prior to injury</td>
<td>Prescribing of opioids for acute pain*</td>
</tr>
<tr>
<td>Home and/or work environment</td>
<td></td>
</tr>
<tr>
<td>Activity level prior to injury</td>
<td></td>
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<tr>
<td>Severity of injury</td>
<td></td>
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</tbody>
</table>

*This does not apply to severe trauma when opioids should be used briefly.
Risk of disability – systematic review\textsuperscript{77}

- Disability after upper extremity injury was most consistently associated with:
  - depression (21 cohorts)
  - catastrophic thinking (13 cohorts)
  - anxiety (11 cohorts)
  - pain self-efficacy (eight cohorts)
  - pain interference (seven cohorts)
  - Social and demographic
  - Measures of impairment such as ROM and injury severity were least associated with disability

Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury - 2019\textsuperscript{78}

“Studies of musculoskeletal injuries, including ankle sprains and fractures, have found no association between pain intensity and degree of nociception (injury severity). Variations in pain intensity and magnitude of limitations are accounted for more by measures of psychosocial aspects of illness than by measures of pathophysiology.”
Key points in pain assessment

- Everyone feels pain differently
  - Our brain changes how we feel pain
- Psychosocial issues and central sensitization are major drivers in pain perception
Treating Acute Pain

Initial assessment

How much of the pain is from:

- Tissue input?
- Thoughts?
- Emotions?
- Social factors?
For most pain:

- Treating the nociceptive (tissue input) aspect of acute pain quickly and effectively will be all that is needed.

For all types of pain:

- Opioids are usually the worst option
The problem with opioids:

- Mentally impairing.\textsuperscript{8,9}
- Delay recovery.\textsuperscript{10,11}
- Increase medical costs.\textsuperscript{12}
- Opioid hyperalgesia.\textsuperscript{13,14}
- Double the chance of disability (if prescribed for 7 days or more).\textsuperscript{15}
- Increase falls and fractures.\textsuperscript{16}
- Cardiac.\textsuperscript{79, 17}
  - Individuals on opioids have 3 times higher incidence of MI c/w age-matched controls
  - Higher incidence of MI than those on Vioxx or Bextra.
- GI bleeding.\textsuperscript{18}
  - Similar to nonselective NSAIDs. More than coxibs.

The problem with opioids:

- They are very calming.\textsuperscript{86} (Initially calming but with tolerance, anxiety increases.)
- Treat depression.\textsuperscript{19} (Initially depression improves but after one month, depression is worse.)
- Brain changes.\textsuperscript{20}
- Diversion (4-24\% of prescribed opioids are used non-medically).\textsuperscript{75}
- Triple the risk that a family member will overdose.\textsuperscript{80}
- Addiction.\textsuperscript{21,22}
Acute rx leads to long-term use\textsuperscript{47}

Duration of acute use:
- 1 day - 6% chance of still using that drug a year later.
- 8 days - 13.5%.
- 31 days - 29.9%.

Opioid types:
- Long-acting opioid: 27%
- Oxycodone: 9%
- Tramadol 13.7%

Teens who received a prescription for opioid pain medication by Grade 12 were at 33 percent increased risk of misusing an opioid between ages 19 and 25.

Among those with low predicted risk of future opioid use in 12th grade, having an opioid prescription increased their risk of post-high-school opioid misuse three-fold.
Adolescents and young adults who received a dental opioid rx

- Of those that got an rx from a dentist, 6.9% received another opioid rx 3-12 months later.
- Only 0.1% of controls who did not get an opioid got an rx 3-12 months later.
- 5.8% of those that received an opioid had a health encounter with an opioid abuse related dx in the next year c/w 0.4% of those who did not get an opioid.74

Chronic Post-Surgical Pain (CPSP)

- Risk factors:81,82,83,84
  - Preoperative opioid use
    - Withdrawal-associated Injury Site Pain (WISP)85
  - Immediate, severe, postop pain
  - Pain catastrophizing
  - Anxiety
  - Depression
Chronic Postsurgical Pain (CPSP)

• Prevention:
  – ERAS (Enhanced Recovery After Surgery) protocols…

AES Question 2

Which medication is most effective reducing acute pain?

A. Oxycodone 15 mg
B. Oxycodone 10 mg + acetaminophen 1000 mg
C. Ibuprofen 600 mg
D. Ibuprofen 200 mg + acetaminophen 500 mg
Efficacy of pain medications - acute pain\textsuperscript{26,27,51}

\begin{figure}[h]
\centering
\includegraphics[width=0.8\textwidth]{pain_mediations.pdf}
\caption{Percent with 50\% pain relief (1/NNT)}
\end{figure}

Renal colic

\begin{itemize}
\item Cochrane: Opioids no more effective than NSAIDs but more side effects\textsuperscript{73}
\item Lancet: IV acetaminophen and IM diclofenac were both more effective than IV morphine\textsuperscript{63}
\end{itemize}

\textbf{Figure 2:} Proportion of patients with ureteric calculus who did not achieve a significant pain reduction (>50\% reduction from initial pain score)
nRS = Numerical Rating Scale score.
Post-op pain

- Enhanced recovery after surgery (ERAS)
- 109 patients having colorectal surgery c/w 98 controls.52
- Protocol includes:
  - Pre-op counseling
  - carbohydrate loading
  - multimodal analgesia with avoidance of intravenous opioids
  - intraoperative goal-directed fluid resuscitation
  - immediate postoperative feeding
  - Immediate ambulation
ERAS outcomes

ERAS patients compared to controls:

- Ambulated on POD 0: 77% (0%)
- Total morphine equivalents: 63 (280)
- Any complication: 15% (30%)
- Length of stay in days: 4.6 (6.8)
- Hospital costs: $13,306 ($20,435)
- Press-Ganey patient satisfaction: 98% (43%)

www.ERASsociety.org

After severe trauma:

- Immediate IV opioids reduce the risk of developing PTSD.67
- Opioids for longer periods or higher doses increase the risk of developing depression.68
Low-dose ketamine\textsuperscript{71}

- Meta-analysis 2018 – not inferior to morphine.
- Dose: 0.3 mg/kg IV (25 mg max)
  - Most studies use 0.1-0.5 mg/kg.
- Peak effect in 5 min. Pain relief lasts at least 2 hours.

Cognitive Behavioral Therapy after acute trauma

- CBT after acute trauma can lower the risk of a long-term disability developing.\textsuperscript{65}
- Cognitive-behavioral intervention and preventive physical therapy can enhance the prevention of long-term disability after acute trauma.\textsuperscript{66}
Behavioral tx of acute pain

• Brief mindfulness training and self-hypnosis reduces acute pain in the hospital\(^\text{69}\)

Other Tx

• Neuroscience education
• Virtual reality
• Music
• Regional blocks
  – Hip fractures
• Hypnosis
• Nitrous oxide
AES Question 3

According to the CDC guidelines for using opioids to treat chronic pain, how long should you prescribe opioids for acute pain?

A. Usually 1 day or less. 3 days max.
B. Usually 3 days or less. 7 days max.
C. Usually 5 days or less. 7 days max.
D. Usually 7 days or less. 10 days max.

If you use opioids for acute pain:

• They are most helpful for their calming effects.
• Use for 3 days or less.
• Check the PDMP first!
Practice recommendations

• First assess for all aspects of pain contributors
• Use ibuprofen 200mg + acetaminophen 500mg qid for most cases of acute nociceptive pain
• If there is a documented contraindication to an NSAID or acetaminophen, consider using one or the other
• If adding an opioid to NSAID and/or acetaminophen, prescribe for 3 days or less (and use mostly for the calming effects)

Practice recommendations

• Also consider cognitive, behavioral contributors to acute pain
• Mindfulness, CBT, behavioral therapy may be helpful if available (addresses cognitive and behavioral aspect)
• A positive physician attitude will improve pain outcomes (addresses cognitive aspect)
• Return to work ASAP
Practice recommendations

• Do NOT use opioids for:
  – Acute exacerbations of back pain
  – Headaches
  – Routine sprains and fractures
  – Lacerations
  – Office surgical procedures
  – Dental pain

Time permitting…

• Methadone and buprenorphine patients with acute pain.
Resources

www.teaterhs.com/acute-pain-treatment

(all resources on my website are free)

Questions
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References:


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