Assess, Prevent and Manage Pain
KEY REFERENCES – laying the foundation for “A” of ABCDEF bundle

• Payen J. *Crit Care Med* (Behavioral Pain Scale) 2001;29:2258-2263
• Payen J. *Anesthesiology* (Behavioral Pain Scale) 2009; 111: 1308-16
• Chanqués G. *Crit Care Med* (Pain Assessment in ICU) 2010;151: 711-721
• Gelinas C. *Int J Nursing Stud* (Overcome Barriers Pain Assess) 2011;48: 1495–1504
• Puntillo K. *Am J Respir Crit Care Med* (New Insights ICU Pain Control) 2014; 89: 39-47
Course Objectives

• Compare valid & reliable pain assessment tools
• Identify special challenges to effective pain assessment, prevention, & management
• Integrate effective strategies to prevent & manage pain into everyday clinical practice
• Incorporate evidence from the PAD Guidelines, including Quality of Evidence and Strength of Recommendations
Interpreting the PAD Guidelines

Statements and Recommendations

Quality of evidence: *statements and recommendations*

- High (A)
- Moderate (B)
- Low/Very Low (C)

Strength of recommendations: *recommendations only*

- Either strong (1), weak (2), or none (0)
- Either in favor of an intervention (+) or against an intervention (-)
## Improve Patient Comfort, Safety, and Outcomes

**PAD SYMPTOMS**

### Pain
- **NRS:** Numeric Rating Scale
- **BPS:** Behavioral Pain Scale
- **CPOT:** Critical Care Pain Observation Tool

### Agitation
- **RASS:** Richmond Agitation Sedation Scale
- **SAS:** Sedation Agitation Scale

### Delirium
- **CAM-ICU:** Confusion Assessment Method for ICU
- **ICDSC:** Intensive Care Delirium Screening Checklist

## Care Improvement ABCDEF Bundle

- **A**ssess, Prevent, and Manage Pain
- **B**oth Spontaneous Awakening Trials and Spontaneous Breathing Trials
- **C**hoice of Sedation
- **D**elirium: Assess, Prevent and Manage
- **E**arly Mobility and **E**xercise
- **F**amily Engagement and **E**mpowerment
SCCM Pain Care Bundle

Assess

• Assess pain ≥ 4x/shift & PRN
• Significant pain with NRS >3, BPS >5, or CPOT>2

Treat

• Treat pain within 30 minutes of detecting significant pain & REASSESS:
  • Non-pharmacological treatment (e.g. relaxation)
  • Pharmacological treatment

Prevent

• Administer pre-procedural analgesia and/or non-pharmacological interventions
• Treat pain first, then sedate

Pain: Overview

• Affects majority of ICU patients
• Patients with diminished communication or cognitive capabilities at risk
• Reliable & valid pain assessment is foundation for effective pain treatment
• Choosing the best intervention to treat pain is challenging
Pain - Definition

• Pain is an unpleasant sensory & emotional experience
• Best reported by the person who is experiencing it
  • Self-report challenging in ICU environment
• Inability to communicate verbally does not negate the possibility that an individual is experiencing pain


(IASP in Pain 1979:6:249-252)
Self-Report of Pain—Gold Standard

0 – 10 Numeric Rating Scale

Slide courtesy of J-F Payen

0-10 visually enlarged horizontal NRS most valid & reliable

If Patient Unable to Self-Report: A Stepwise Approach

American Society for Pain Management Nursing

1. Attempt to obtain the patient’s self-report of pain – Gold standard
   A simple yes or no = valid self-report

2. Look for behavioral changes
   Use a standardized and valid behavioral pain scale

3. The family can help to identify pain behaviors

4. Sources of pain = “Assume pain is present”
   Attempt an intervention for pain relief

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Behavioral Pain Scales

- The Critical Care Pain Observation Tool (CPOT) & the Behavioral Pain Scale (BPS) are the most valid scales for monitoring pain in medical, postoperative, and trauma (except for brain injury) patients unable to self-report in whom motor function is intact & in whom behaviors are observable.

Barr J. *Crit Care Med* 2013; 41: 263-306
Can’t Rely on Vital Signs for Pain Assessment

iii. Vital signs should not be used alone to assess pain (-2C).
(are not valid pain indicators)

Vital signs may be used as a cue to begin further assessment of pain (+2C).

# Behavioral Pain Scale (BPS)
(abbreviated version)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACIAL EXPRESSION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>UPPER LIMBS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>COMPLIANCE WITH VENTILATOR</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

Score Range 3 – 12. Significant pain = BPS >5

Payen JF *Crit Care Med* 2001;29: 2258-2263
Behavioral Pain Scale (BPS)

1. Relaxed
2. Partially tightened
3. Fully tightened
4. Grimacing
5. No movement
6. Partially bent
7. Fully bent with finger flexion
8. Permanently retracted

Slide courtesy of J-F Payen
## CPOT (abbreviated version)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACIAL EXPRESSION</td>
<td></td>
</tr>
<tr>
<td>Relaxed, neutral</td>
<td>0</td>
</tr>
<tr>
<td>Tense</td>
<td>1</td>
</tr>
<tr>
<td>Grimacing</td>
<td>2</td>
</tr>
<tr>
<td>BODY MOVEMENTS</td>
<td></td>
</tr>
<tr>
<td>Absence of movements</td>
<td>0</td>
</tr>
<tr>
<td>Protection</td>
<td>1</td>
</tr>
<tr>
<td>Restlessness</td>
<td>2</td>
</tr>
<tr>
<td>MUSCLE TENSION (evaluate by passive flexion and extension of upper extremities)</td>
<td></td>
</tr>
<tr>
<td>Relaxed</td>
<td>0</td>
</tr>
<tr>
<td>Tense, rigid</td>
<td>1</td>
</tr>
<tr>
<td>Very tense or rigid</td>
<td>2</td>
</tr>
<tr>
<td>COMPLIANCE WITH VENTILATOR (intubated patients)</td>
<td></td>
</tr>
<tr>
<td>Alarms not activated; easy ventilation</td>
<td>0</td>
</tr>
<tr>
<td>Coughing but tolerating</td>
<td>1</td>
</tr>
<tr>
<td>Fighting ventilator</td>
<td>2</td>
</tr>
<tr>
<td>VOCALIZATION (extubated patients)</td>
<td></td>
</tr>
<tr>
<td>Talking in normal tone or no sound</td>
<td>0</td>
</tr>
<tr>
<td>Sighing, moaning</td>
<td>1</td>
</tr>
<tr>
<td>Crying out, sobbing</td>
<td>2</td>
</tr>
</tbody>
</table>

**CPOT range = 0 – 8; CPOT >2 is significant**
Behavioral Pain Assessment: Summary

• Be cautious: behavioral score ≠ self-report score
  • For example: 8/10 self-report NRS ≠ 6.4/8 CPOT score
• Behaviors detect presence/absence of pain
• Behavior pain scales allow for assessment of intervention effectiveness

If Patient Unable to Self-Report: A Stepwise Approach

American Society for Pain Management Nursing

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The family can help to identify pain behaviors

American Society for Pain Management Nursing

Can “Proxy Reporters” Help?
## Proxy Reports of Symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Patient-Family</th>
<th>Patient-RN</th>
<th>Patient-MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>0.43(^a)</td>
<td>0.29</td>
<td>0.40(^a)</td>
</tr>
<tr>
<td>Tiredness</td>
<td>0.27</td>
<td>0.24</td>
<td>0.52(^a)</td>
</tr>
<tr>
<td>SOB</td>
<td>0.48(^a)</td>
<td>0.18</td>
<td>0.36(^a)</td>
</tr>
<tr>
<td>Restlessness</td>
<td>0.41(^a)</td>
<td>0.15</td>
<td>0.07</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.45(^a)</td>
<td>0.22</td>
<td>0.21</td>
</tr>
<tr>
<td>Sadness</td>
<td>0.35(^a)</td>
<td>−0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>Hunger</td>
<td>0.23</td>
<td>0.24</td>
<td>−0.14</td>
</tr>
<tr>
<td>Fear</td>
<td>0.46(^a)</td>
<td>0.18</td>
<td>0.05</td>
</tr>
<tr>
<td>Thirst</td>
<td>0.29</td>
<td>0.25</td>
<td>0.33</td>
</tr>
<tr>
<td>Confusion</td>
<td>0.28</td>
<td>0.32</td>
<td>0.29</td>
</tr>
</tbody>
</table>

\(^a\) Intraclass correlation coefficients. (Hemphill JF. Am Psychol 2003; 58:78–79)

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Sources of pain = “Assume pain is present”
Attempt an intervention for pain relief (ASPMN)

• When patient unable to use self-report or exhibit behaviors, can “Assume Pain Present”

• For example, in patients:
  • Receiving NMBAs
  • That are unresponsive but have underlying pathology thought to be painful
  • Undergoing activities/procedures known to be painful (activity must be documented)
Challenges

• Cognitive impairment
  • Persons with CI patients less likely to ask for & receive analgesics
  • Providers underestimate pain in CI patients

• Pain in older adults
  • nearly ½ of older adult population experience daily pain
  • May be afraid to report
  • Prone to neuropathic pain or pain from degenerative changes
  • Have > sensitivity to pain; i.e., a lower threshold
Challenge: Doesn’t Look/Act Like Pain

• “Patient does not look like or act like in pain”
• Patients with chronic pain have often adapted their behavioral (& physiological) responses to pain
  • It’s true: they “don’t look like” patients with acute pain
• Patients with psychological dependence on opioids also have physical dependence on opioids.
  • Need to avoid withdrawal.
Consider role of ICU clinicians.

ICUs are not detox centers but, rather, centers to address needs of acute/critical illness.

1st part of working with patients with drug dependence is communication and setting expectations.*

- What is baseline pain score? Might work to get to that score.
- Calculate baseline opioid consumption & start with that. Use non-opioid co-analgesics along with opioids

*Joffe A, Anesthesia & ICU Intensivist; remarks during SCCM Webinar May 28, 2015
Preventing Pain

• Administer pre-procedural analgesia and/or non-pharmacologic interventions (e.g., relaxation therapy) for chest tube removal (+1C)
• Consider same for other procedures
• **Treat pain first;** then sedate
• The first most important step is for clinicians to **recognize** the painfulness of common ICU procedures!

Procedures Hurt!

Most Painful

Turning \(^1,^2\)
Wound Drain Removal \(^1,^2\)
Wound Care \(^1,^2\)

Chest Tube Removal \(^^2\)
Arterial Line Insertion \(^^2\)

Others

ET Suctioning \(^1,^2\)
Tracheal suctioning \(^1,^2\)
Femoral Sheath Removal \(^1\)
Mobilization \(^^2\)

Peripheral Blood Draw \(^^2\)
Peripheral IV Insertion \(^^2\)
Positioning \(^^2\)
Respiratory Exercises \(^^2\)
Central Line Removal \(^1\)

\(^1\) Puntillo K \textit{AJCC} 2001; 10:238-251
Interventions for Procedural Pain

- Opioids
- NSAIDs
- Ketamine
- Relaxation techniques

Time interventions to peak effect!
• Recommend IV opioids be considered as the first-line drug class of choice for non-neuropathic pain (+1C).

• All available IV opioids, when titrated to similar pain intensity endpoints, are equally effective (C).

# Opioid Choices

<table>
<thead>
<tr>
<th>AGENT</th>
<th>EQUI-ANALGESIC DOSE (mg) – IV</th>
<th>EQUI-ANALGESIC DOSE (mg) – P.O.</th>
<th>TIME TO ONSET</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fentanyl</td>
<td>0.1</td>
<td>NA</td>
<td>1-2 min</td>
<td>Less hypotension than morphine; accumulation in hepatic impairment</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>1.5</td>
<td>7.5</td>
<td>5-10 min</td>
<td>May work in patients tolerant to fentanyl/morphine; accumulates in renal/hepatic impairment</td>
</tr>
<tr>
<td>Morphine</td>
<td>10</td>
<td>30</td>
<td>5-10 min</td>
<td>Accumulates in renal/hepatic impairment</td>
</tr>
<tr>
<td>Methadone</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>Intermittent dose: 10-40 mg q 6 – 12 hrs; may slow development of tolerance in an escalating dose requirement; monitor QTc</td>
</tr>
</tbody>
</table>

Important Points: Opioid Administration

• Use of range orders (a dose range with a fixed time interval) is an institutional decision, not a Board of Registered Nursing or Joint Commission mandate.
  • Range orders allow flexibility needed to address patients’ unique and varying opioid requirements
  • Range orders enable necessary and safe adjustment in doses
  • In opioid-naïve patients, 1\textsuperscript{st} dose should be lowest dose in range

Pasero C. *Nurs* 2014; 29: 246-52.
Important Points: Opioid Administration (cont’d)

• The practice of using order sets that link specific pain intensity score to opioid dose is dangerous (e.g., “4 mg IV morphine for pain ratings of 4 - 6.”)

• Discourages nurses from using assessment skills to evaluate other important individual patient factors

And, you may not need opioids...
And, you may not need opioids...
And, you may not need opioids...

Early Intravenous Ibuprofen Decreases Narcotic Requirement and Length of Stay after Traumatic Rib Fracture

Authors: Bayouth, Lilly; Safcsak, Karen; Cheatham, Michael L.; Smith, Chadwick P.; Birrer, Kara L.; Promes, John T.
Source: The American Surgeon, Volume 79, Number 11, November 2013, pp. 1207-1212(6)
## Non-Opioid Analgesics

<table>
<thead>
<tr>
<th>AGENT</th>
<th>INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen (po/pr)</td>
<td>Caution in patients with hepatic impairment</td>
</tr>
<tr>
<td>Acetaminophen (IV)</td>
<td>Caution in patients with hepatic impairment</td>
</tr>
<tr>
<td>Ketorolac (IV)</td>
<td>Avoid in following conditions:</td>
</tr>
<tr>
<td></td>
<td>• Renal dysfunction</td>
</tr>
<tr>
<td></td>
<td>• GI bleed</td>
</tr>
<tr>
<td></td>
<td>• Platelet abnormality</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>Avoid in following conditions:</td>
</tr>
<tr>
<td></td>
<td>• Renal dysfunction</td>
</tr>
<tr>
<td></td>
<td>• GI bleed</td>
</tr>
<tr>
<td></td>
<td>• Platelet abnormality</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>May cause sedation.</td>
</tr>
<tr>
<td></td>
<td>Avoid abrupt discontinuation; may cause seizures</td>
</tr>
<tr>
<td>Ketamine IV</td>
<td>Attenuates the development of acute tolerance to opioids; may cause hallucinations and other psychological disturbances</td>
</tr>
</tbody>
</table>

Treatment of Pain in ICU Patients

• Non-opioid analgesics considered to decrease the amount of opioids administered (or to eliminate the need for IV opioids altogether), and to decrease opioid-related side effects (+2C).

• Either enterally administered gabapentin or carbamazepine, in addition to IV opioids considered for neuropathic pain (+1A).

What to remember – Pain Assessment

• Assessment of pain should not only be done at rest, but also during care procedures as well as before & after the administration of an analgesic

• Always try to obtain the patient’s self-report of pain

• When the patient’s self-report is impossible to obtain, use a validated behavioral pain scale such as the CPOT or BPS
What to remember – Pain Assessment

• Self-report score ≠ behavioral score

• Viewing pain assessment & treatment through the lens of multi-faceted quality care is optimal approach

• High opioid consumption is considered >40 mg oral morphine equivalent daily
What to remember – Pain Assessment

• Not all patients will need opioids, so maximize non-opioids first when able.

• Pain contributes to agitation & delirium, so treat to pain first.

• Validated tools in general ICU are the best starting points for assessment in difficult populations.
Pain Assessment - 
Essential 1st step
Match tool to patient’s capacity
Self-report score ≠ behavioral score
Rely on research for tool selection

Pain Prevention - 
Administer pre-procedural analgesia and/or non-pharmacological interventions; treat pain 1st

Pain Management - 
Treat significant pain within 30 minutes
Treat pain first; then sedate prn
Opioids might be first line, but consider non-opioids and multimodal therapies

Assess, Prevent, and Manage Pain
Acknowledgements

• Slide presentation prepared by
  Kathleen Puntillo RN, PhD, FAAN, FCCM
  Michele Balas RN, PhD, ACNP-BC, CCRN, FCCM

• Thank you to Celine Gelinas RN, PhD and Aaron Joffe D.O. for some slides
1. Pain & Analgesia

a. Incidence of pain

- Adult medical, surgical, and trauma ICU patients routinely experience pain, both at rest and with routine ICU care (B).

- Pain in adult cardiac surgery patients is common and poorly treated; women experience more pain than men after cardiac surgery (B).

- Procedural pain is common in adult ICU patients (B).
b. Pain assessment

- We **recommend** that pain be routinely monitored in all adult ICU patients (+1B).

- The Behavioral Pain Scale (BPS) & the Critical-Care Pain Observation Tool (CPOT) are the most valid and reliable behavioral pain scales for monitoring pain in medical, postoperative, or trauma (except for brain injury) adult ICU patients who are unable to self-report & in whom motor function is intact & behaviors are observable. Using these scales in other ICU patient populations & translating them into foreign languages other than French or English require further validation testing (B).

- We **do not suggest** that vital signs (or observational pain scales that include vital signs) be used alone for pain assessment in adult ICU patients (–2C).

- We **suggest** that vital signs may be used as a cue to begin further assessment of pain in these patients, however (+2C).
c. Treatment of pain

- We **recommend** that preemptive analgesia and/or nonpharmacologic interventions (e.g., relaxation) be administered to alleviate pain in adult ICU patients prior to chest tube removal (+1C).

- We **suggest** that for other types of invasive and potentially painful procedures in adult ICU patients, preemptive analgesic therapy and/or nonpharmacologic interventions may also be administered to alleviate pain (+2C).

- We **recommend** that intravenous (IV) opioids be considered as the first-line drug class of choice to treat non-neuropathic pain in critically ill patients (+1C).

- All available IV opioids, when titrated to similar pain intensity endpoints, are equally effective (C).
c. Treatment of pain

- We **suggest** that nonopioid analgesics be considered to decrease the amount of opioids administered (or to eliminate the need for IV opioids altogether) and to decrease opioid-related side effects (+2C).

- We **recommend** that either enterally administered gabapentin or carbamazepine, in addition to IV opioids, be considered for treatment of neuropathic pain (+1A).

- We **recommend** that thoracic epidural anesthesia/analgesia be considered for postoperative analgesia in patients undergoing abdominal aortic aneurysm surgery (+1B).

- We provide **no recommendation** for using a lumbar epidural over parenteral opioids for postoperative analgesia in patients undergoing abdominal aortic aneurysm surgery, due to a lack of benefit of epidural over parenteral opioids in this patient population (0,A).
c. Treatment of pain

- We provide **no recommendation** for the use of thoracic epidural analgesia in patients undergoing either intrathoracic or nonvascular abdominal surgical procedures, due to insufficient and conflicting evidence for this mode of analgesic delivery in these patients (0,B).

- We **suggest** that thoracic epidural analgesia be considered for patients with traumatic rib fractures (+2B).

- We provide **no recommendation** for neuraxial/ regional analgesia over systemic analgesia in medical ICU patients, due to lack of evidence.
CPOT: Directions for Use

- The patient must have an intact motor function & no brain injury which could affect LOC

- Observation period
  - 1 minute at rest (baseline)
  - During painful procedures (ex: turning)
  - Before and at peak effect of analgesics

- Rating: the highest score observed

- Four behavioral components:
  1. Facial Expressions
  2. Body Movements
  3. Compliance with the ventilator (intubated) or vocalization (non- intubated)
  4. Muscle tension - assess the last when patient is at rest

CPOT Training Video http://www.iculiberation.org/Pain-Agitation-Delirium/Pages/Pain.aspx
CHALLENGES

• Cognitive impairment
• Pain in older adults
• Patient “doesn’t look like in pain”
Challenge:

Pain in patients with cognitive impairment (CI)

Little research in critical care. In general:

• Patients with mild CI are able to accurately report pain
• Markedly impaired patients report less intense pain & smaller number of pain complaints than mildly impaired
• CI patients will report pain, if present, when specifically asked
• CI patients less likely to ask for & receive analgesics
• Providers underestimate pain in CI patients
• For patients who are CI & deny pain or don’t respond to questions about pain, use a behavioral observational assessment tool to screen for pain (although CPOT and BPS not tested in CI patients)

Challenge: Pain in CI (cont’d)

- Self-report in CI patients improved by asking patients to describe a painful event in past & compare to present pain

- Fair evidence most CI patients can understand at least 1 self-assessment measure (horizontal VAS, vertical VAS, faces pain scale, & verbal rating scale)

- Best practice for pain management: similar to non-CI patients: comprehensive approach

- Self-reports of pain are altered during delirious episodes

Challenge: Pain in Older Adults

- By 2040, about 70 million people in USA > 65; about ½ with daily pain. Most > 75 are “normally” in pain every day.
  - May be unconditioned from immobility
  - May be afraid to report

- Prone to neuropathic pain or pain from degenerative changes

- Older adults have > sensitivity to pain; i.e., a lower threshold

- Cognitive impairment may make assessment difficult.

Diallo B. Dim of Crit Care Nurs, 2014; (6):316/319
Challenge: Pain Assessment in Older Adults

- Verbal rating scale most suitable
- Repeat instructions
- Give adequate time to respond
- Make 3 attempts
- Use family or caregivers
- Use behavioral pain scales (CPOT or BPS) for patients unable to self-report.

(Barr J et al., CC, 2013; 41: 263-306.)

Closs SJ J Pain Symptom Manage 2004; 27:196-205;
What can you use?

<table>
<thead>
<tr>
<th>Agent</th>
<th>Equianalgesic Dose (MG)</th>
<th>Onset</th>
<th>Half-life</th>
<th>Context-sensitive half-time</th>
<th>Intermittent Dose</th>
<th>Infusion Dose Range (Usual)</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV</td>
<td>PO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opiates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>0.1</td>
<td>N/A</td>
<td>1-2 min</td>
<td>2-4 hrs</td>
<td>200 mins (6 hr infusion); 300 mins (12 hr infusion)*</td>
<td>0.35-0.5 mcg/kg iv q 0.5-1h</td>
<td>0.7-10 mcg/kg/hr</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>1.5</td>
<td>7.5</td>
<td>5-10 min</td>
<td>2-3 hrs</td>
<td>N/A</td>
<td>0.2-0.6 mg iv q 1-2 h</td>
<td>0.5-3 mg/hr</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Morphine</td>
<td>10</td>
<td>30</td>
<td>5-10 min</td>
<td>3-4 hrs</td>
<td>N/A</td>
<td>2-4 mg iv q 1-2 h</td>
<td>2-30 mg/hr</td>
</tr>
<tr>
<td>Methadone</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>9-59</td>
<td>N/A</td>
<td>10-40 mg po q 6-12 h</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Remifentanil</td>
<td>N/A</td>
<td>N/A</td>
<td>1-3 min</td>
<td>3-10 min</td>
<td>3-4 mins</td>
<td>N/A</td>
<td>1.5 mcg/kg LD then 0.5-15 mcg/kg/hr</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### Opioid Conversion*

<table>
<thead>
<tr>
<th>Opioid</th>
<th>Approximate Equianalgesic Dose (oral &amp; transdermal) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine (reference)</td>
<td>30mg</td>
</tr>
<tr>
<td>Codeine</td>
<td>200mg</td>
</tr>
<tr>
<td>Fentanyl transdermal</td>
<td>12.5mcg/hr</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>30mg</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>7.5mg</td>
</tr>
<tr>
<td>Methadone</td>
<td>Chronic: 4mg†</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>20mg</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>10mg</td>
</tr>
<tr>
<td>Propoxyphene</td>
<td>130-200 mg</td>
</tr>
</tbody>
</table>

*Adapted from VA 2003 & FDA labeling
†Equianalgesic dosing ratios between methadone and other opioids are complex, thus requiring slow, cautious conversion (Ayonrinde 2000)

Vicodin®/Lortab®

Percocet®

Darvocet®

High opioid consumption is considered >40 mg oral morphine equivalent daily

*Joffe A, Anesthesia & ICU Intensivist; SCCM Webinar ;5/28/15
Algorithm Regarding Dose Selection from an Opioid Range Order
From: Cooper, A. & Salazar, N. (8/2012). UCSF Medical Center, Department of Nursing, Nursing Procedures Manual, with permission.

Choosing a Dose from a Pain Medication Range Order

Has the patient received the medication before?

- **No**
  - Provide the lowest dose in range first.
  - Assess and document the patient’s response during the peak effect of the medication.
  - If dose is ineffective, move to a higher dose within the ordered time and frequency.
  - Assess and document the patient’s response during the peak effect of the medication.
  - If the dose is still ineffective, notify provider for other pain management options.

- **Yes**
  - Determine if the dose received was effective in treating the patient’s pain.
  - If yes, evaluate the patient’s response during the peak effect of the medication safe.
  - Provide the dose that was effective in managing pain.