



ST. JOHN'S
UNIVERSITY

It Doesn't Have to Be Painful: Optimizing Analgesia in Critically Ill Patients

Samantha Moore, PharmD, BCCCP

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Disclosure

- I have no financial disclosures or conflicts of interest

Objectives

- Identify the negative outcomes associated with uncontrolled pain in critically ill adult patients
- Describe a validated and evidence-based assessment method for detecting pain in critically ill adult patients who are unable to communicate
- Recommend an appropriate analgesic regimen, incorporating multi-modal agents, for a critically ill patient

Pain in the Intensive Care Unit (ICU)

- Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”
- Occurs in $\geq 50\%$ of critically ill patients
 - Pain is common at rest and with procedures
 - Patients and family report pain as their most stressful experience
- Detection and management of pain can be complex
 - Multiple sources of pain
 - Patients are often unable to communicate

Raja SN et al. Pain. 2020;161:1976-82.

Devlin J et al. Crit Care Med. 2018;46:e825-73.

Novaes MA et al. Intensive Care Med. 1999;25:1421-26.

Puntillo KA et al. Curr Opin Crit Care. 2016;22:506-12.

Marra A et al. Crit Care Clin. 2017;33:225-43.

Patient TR

- TR is a 28 year old woman who is admitted to the ICU yesterday after a gunshot wound to the abdomen requiring an exploratory laparotomy. She is intubated and sedated on propofol 30 mcg/kg/min but is not receiving any analgesia. Upon evaluation and discussion with the nurse, it is determined the patient is experiencing pain based on her behavioral pain scale score of 7. Which of the following statements is true regarding untreated pain in critically ill patients?
 - a) Untreated pain in the ICU can cause immunosuppression and impaired wound healing
 - b) Untreated pain in the ICU does not impact the risk of developing chronic intensive care related pain
 - c) Untreated pain in the ICU results in less opioids used and improved patient outcomes
 - d) Untreated pain in the ICU does not impact patient outcomes, as long as patients are at their goal sedation level

Factors Associated with Pain in the ICU

At Rest

- Younger age
- Number of comorbidities
- History of anxiety/depression
- Time from pain recognition to analgesic initiation
- ICU length of stay

During Procedures

- Type of procedure
- Surgery or trauma
- Younger age
- Female sex

Impact of Uncontrolled Pain in the ICU

- Untreated pain causes patients psychological and physiologic stress
 - Cardiac instability
 - Respiratory compromise
 - Immunosuppression
 - Impaired wound healing
 - Anxiety/depression
 - Post-traumatic stress disorder (PTSD)
 - Chronic-intensive care related pain

Chronic-Intensive Care Related Pain (CIRP)

- No widely accepted definition
 - One study defined it as “clinically relevant pain 6 months after ICU discharge lasting for at least 3–6 months and when patients attribute this pain to their ICU stay”
- Incidence varies between 33-73%
- Unclear risk factors
 - Majority of data extrapolated from surgical population
 - Preexisting pain
 - Younger age, female sex
 - High pain intensity and prolonged pain duration
- Significantly impacts physical, psychological and social well-being of patients

Patient TR

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ABCDEF Bundle

- **Assess, Manage, and Prevent pain**
- Both Spontaneous Awakening Trials (SAT) and Spontaneous Breathing Trials (SBT)
- Choice of analgesia and sedation
- Delirium: Assess, Prevent, and Manage
- Early mobility and Exercise
- Family engagement and empowerment

Pain Management in the ICU

Assess

- Use validated pain assessment tools to regularly assess and document pain scores

Treat

- Opioids are the mainstay of treatment but are not *always* needed
- Consider multimodal therapy: non-opioid analgesics and non-pharmacologic treatments
- Always treat pain before adding a sedative

Prevent

- Pre-treat before known painful procedures

Patient RS

- RS is a 67 year old woman with a PMH of poorly controlled T2DM and HTN admitted to the MICU with pyelonephritis and septic shock
 - WBC: $14.1 \times 10^9/L$; Lactate: 3.1 mg/dL; SCr: 1.4 mg/dL (baseline 0.6 mg/dL)
 - Temp: 101.4 F; MAP: 67 mmHg, HR: 115 bpm, RR: 23/min
 - Home meds - lisinopril 10 mg PO daily, insulin glargine 10 u SQ daily, gabapentin 300 mg PO TID

Patient RS

- RS is mechanically ventilated and receiving LR 75 ml/hr, norepinephrine 5 mcg/min, and fentanyl 12.5 mcg/hr. She is agitated and reaching for her endotracheal tube. What is the most appropriate next step for RS's care?
 - a) Use a validated pain tool to assess for the presence of pain
 - b) Use a validated delirium screening tool to assess for the presence of delirium
 - c) Start a propofol infusion at 10 mcg/kg/min
 - d) Increase the fentanyl infusion to 25 mcg/hr

Pain Assessment

- Pain should be routinely assessed and documented for all ICU patients using a validated assessment tool
 - Perform at least 4 times per nursing shift and as needed
 - Essential for proper identification and treatment of pain and for monitoring patient response to analgesia

Stepwise Approach to Pain Assessment

1

Be aware of sources of pain

2

Attempt to obtain patient's self-report

3

Use a validated behavioral pain tool

4

Use proxy reporters

5

Attempt an analgesic trial/assume pain is present

1) Sources of Pain in ICU Patients

Pathologic Conditions

- Surgery
- Trauma
- Wounds
- History of chronic pain

Iatrogenic/Procedural Pain

- Wound care
- Positioning/turning
- Chest tube placement/removal
- Arterial line placement
- Central line placement
- Suctioning

2) Attempt to Obtain Patient's Self-Report

- Patient self-reporting is the gold standard!
 - Pain is subjective
- 0-10 Numeric Rating Scale
 - Should be used in critically ill adult patients able to self-report pain
 - May be administered verbally or visually
- Descriptive pain scale should be used if patients cannot use a numeric scale
 - Verbal descriptor scale

Self-Report Pain Scales

Verbal Descriptor Scale

No Pain

Mild Pain

Moderate
Pain

Severe
Pain

Extreme
Pain

Numeric Rating Scale

0

1

2

3

4

5

6

7

8

9

10

No
Pain

Worst
Pain

3) Use a Validated Behavioral Pain Tool in Non-Communicative Critically Ill Patients

- ***The inability to communicate pain does not negate the possibility a patient is experiencing pain!***
- Use a validated behavior pain tool
 - Behavioral Pain Scale (BPS)
 - Critical Care Pain Observation Tool (CPOT)
- Vital signs
 - NOT valid indicators for pain in critically ill adults
 - Use as cues to initiate further pain assessment

Behavioral Pain Scale (BPS)

- Validated in intubated and non-intubated patients
- Evaluates three behavioral categories and assigns a score of 1-4 for each
 - Facial expression
 - Movement of upper limbs
 - Tolerance of mechanical ventilation or vocalization
- Score of ≥ 5 indicative of unacceptable pain
 - Should be treated

BPS
(intubated patients)

1 2 3 4

Facial expression



Relaxed Partially tightened = brow lowering Fully tightened = eyelid closing Grimacing = folded cheek

Movements of upper limbs



No movement Partially bent Very bent with finger flexion Retracted, opposition to care
At rest: check the tonus by mobilisation of the limb

Compliance with ventilation



Tolerating ventilation Coughing but tolerating ventilation most of the time Fighting ventilator but ventilation possible sometimes Unable to control ventilation

BPS-NI
(non-intubated patients)

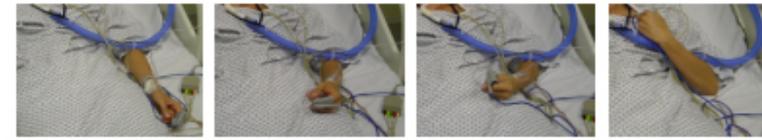
1 2 3 4

Facial expression



Relaxed Partially tightened = brow lowering Fully tightened = eyelid closing Grimacing = folded cheek

Movements of upper limbs



No movement Partially bent Very bent with finger flexion Retracted, opposition to care
At rest: check the tonus by mobilisation of the limb

Vocalisation

No pain vocalization Moaning not frequent ($\leq 3/\text{mn}$) and not prolonged ($\leq 3 \text{ s}$) Moaning frequent ($> 3/\text{mn}$) or prolonged ($> 3 \text{ s}$) Howling or verbal complaint including « Ow! , Ouch ! » or breath-holding

①

②

③

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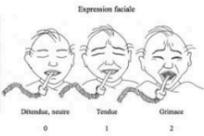
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① + ② + ③ = BPS

Critical-Care Pain Observation Tool (CPOT)

- Assesses pain with four behavioral categories and assigns a score of 0 - 2 for each
 - Facial expression
 - Body movements
 - Muscle tension
 - Ventilator compliance or vocalization
- Score of ≥ 3 indicative of unacceptable pain

Indicator	Score	Description
Facial expression  <p>Caroline Arbour, RN, B.Sc., PhD(student) School of Nursing, McGill University</p>	Relaxed, neutral 0	No muscle tension observed
	Tense 1	Presence of frowning, brow lowering, orbit tightening and levator contraction or any other change (e.g. opening eyes or tearing during nociceptive procedures)
	Grimacing 2	All previous facial movements plus eyelid tightly closed (the patient may present with mouth open or biting the endotracheal tube)
Body movements	Absence of movements or normal position 0	Does not move at all (doesn't necessarily mean absence of pain) or normal position (movements not aimed toward the pain site or not made for the purpose of protection)
	Protection 1	Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements
	Restlessness/Agitation 2	Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed
Compliance with the ventilator (intubated patients) OR Vocalization (extubated patients)	Tolerating ventilator or movement 0	Alarms not activated, easy ventilation
	Coughing but tolerating 1	Coughing, alarms may be activated but stop spontaneously
	Fighting ventilator 2	Asynchrony: blocking ventilation, alarms frequently activated
	Talking in normal tone or no sound 0	Talking in normal tone or no sound
	Sighing, moaning 1	Sighing, moaning
	Crying out, sobbing 2	Crying out, sobbing
Muscle tension Evaluation by passive flexion and extension of upper limbs when patient is at rest or evaluation when patient is being turned	Relaxed 0	No resistance to passive movements
	Tense, rigid 1	Resistance to passive movements
	Very tense or rigid 2	Strong resistance to passive movements or incapacity to complete them
TOTAL	___ / 8	

C POT

①

Indicator	Score	Description	
Facial Expression	Relaxed neutral	0	No muscle tension observed
	Tense	1	Frowning, brow lowering, orbit tightening, levator contraction, or any other change during nociceptive procedures
	Grimacing	2	All of the above + eyelid tightly closed (patient may have mouth open or biting endotracheal tube)
Body Movements	No movement	0	Does not move at all (does not always mean absence of pain) or normal position (movements not aimed toward pain site or made for purpose of protection)
	Protection	1	Slow cautious movements, touching/rubbing pain site, seeking attention through movements
	Restlessness /Agitation	2	Pulling tube, attempting to sit up, moving limbs/thrashing, not following commands, striking at staff, trying to climb out of bed

②

Continued on next slide

CPOT (continued)

③

Indicator	Score	Description	
Muscle Tension	Relaxed	0	No resistance to passive movement
	Tense, rigid	1	Resistance to passive movements
	Very tense or rigid	2	Strong resistance to passive movements or incapacity to complete them

④

Compliance with Ventilator	Tolerating ventilator or movement	0	Alarms not activated, easy ventilation
	Coughing but tolerating	1	Coughing, alarms may be activated but stop spontaneously
	Fighting ventilator	2	Asynchrony: blocking ventilation, alarms frequently activated
Vocalization	Talking in normal tone or no sound	0	Talking in normal tone or no sound
	Sighing, moaning	1	Sighing, moaning
	Crying out, sobbing	2	Crying out, sobbing

or

$$\textcircled{1} + \textcircled{2} + \textcircled{3} + \textcircled{4} = \text{CPOT}$$

Behavioral Pain Tool Limitations

- Not equivalent to a self-report pain intensity
 - BPS of 10/12 \neq NRS of 8.33
- Cannot use if behavior is not observable
 - Deeply sedated (Richmond Agitation Sedation Scale Score \leq -4)
 - Receiving NMBA
 - Weakness or joint malformation

4) Proxy Reporters of Pain

- Limited evidence supports the use of family as proxy reporters to help identify pain behaviors in non-communicative critically ill patients
- Proxy reporters often overestimate pain severity

5) Source of Pain?

Assume Pain is Present and Treat

- Patients who are unable to self-report pain and their behaviors are not observable
 - If a potential source of pain/high likelihood of pain -> TREAT!
 - Patients with underlying pain pathology (ex – recent major surgery, fractures etc.)
 - Undergoing known painful procedures (ex – chest tube placement/removal)
 - Patients receiving neuromuscular blocking agents
- A trial of an analgesic may be used as a form of assessment

Importance of Pain Assessment

- Standardized, assessment-driven ICU pain management protocols improve overall patient outcomes
- Benefits of regular pain assessment
 - Reduced sedative use
 - Improved pain scores
 - Increased use of nonopioid analgesics
 - Reduced duration of mechanical ventilation and length of stay
- Despite benefits, not routinely performed in most ICUs

Stepwise Approach to Pain Assessment

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Patient RS

- RS is mechanically ventilated and receiving LR 75 ml/hr, norepinephrine 5 mcg/min, and fentanyl 12.5 mcg/hr. However, she is noted to be agitated and reaching for her endotracheal tube. What is the most appropriate next step for RS's care?
 - a) Use a validated pain tool to assess for the presence of pain
 - b) Use a validated delirium screening tool to assess for the presence of delirium
 - c) Start a propofol infusion at 10 mcg/kg/min
 - d) Increase the fentanyl infusion to 25 mcg/hr

Patient RS

- RS's nurse attempts to ask the patient about her level of pain using a visual 0-10 numeric scale. However, RS is unable to communicate. Which of the following is a guideline recommended validated pain assessment tool for critically ill patients unable to communicate?
 - a) Vital Sign Variability
 - b) Serum cortisol level
 - c) Behavioral Pain Scale
 - d) Pupillary Reflex Dilation

Patient RS

- The nurse determines that RS has a BPS score of 7. What do you recommend?
 - a) Start dexmedetomidine IV 0.5 mcg/kg/min
 - b) Start acetaminophen 1 g IV Q6H
 - c) Increase fentanyl IV infusion from 12.5 mcg/hr to 100 mcg/hr
 - d) Bolus fentanyl 25 mcg IV and increase IV infusion from 12.5 mcg/hr to 25 mcg/hr

Pain Management in the ICU

Assess

- Use validated pain assessment tools to regularly assess and document pain scores

Treat

- Opioids are the mainstay of treatment but are not *always* needed
- Consider multimodal therapy: non-opioid analgesics and non-pharmacologic treatments
- Always treat pain before adding a sedative

Prevent

- Pre-treat before known painful procedures

Treatment of Pain

Guideline Recommendations

- Analgesia assessment and treatment should be protocol-driven but also individualized and patient specific
- Treat pain FIRST (before adding a sedative)
 - Analgesia-first sedation or “analgo-sedation”
 - Address pain and discomfort prior to sedative use or escalation
- Opioids are the mainstay of therapy for analgesia in most critically ill patients
- Nonopioid analgesics and non pharmacologic analgesic therapies should be used when appropriate

Pain Treatment Considerations

- Patient factors

- Severity of pain, etiology of pain, type of pain
- Risk of medication adverse effects
- Procedural vs pain at rest
- Allergies
- Active or history of opioid use disorder/substance use disorder
- Chronic pain, home medications
- Patient access (enteral, intravenous etc)
- Organ dysfunction (renal, hepatic, pulmonary, hematologic)
- Acute illness, hemodynamic instability
- Patient wishes

- Medication factors

- PK/PD parameters
- Drug interactions
- Potential adverse effects
- Dosage form availability

- Other

- Institutional protocols/guidelines, resources, medication availability etc.

Opioid Analgesics

- First line option for pain treatment for most critically ill patients
 - $\geq 80\%$ mechanically ventilated patients receive opioids in the ICU
- Opioids improve mechanical ventilation synchrony and promotes sedation/reduces agitation
- All opioids are equally effective at equivalent doses
 - Choice of opioid should be patient specific

Opioid Considerations

- Intermittent boluses versus continuous infusion
 - Tolerance develops faster with an infusion
 - Try intermittent dosing first in most patients
 - If ≥ 2 -3 doses per hour consider infusion
- Enteral opioids can be considered in patients with adequate access, absorption, and motility
- Patient controlled analgesia for select patients
- The lowest effective dose should always be used

Commonly Used Intravenous Opioids

Opioid	Equi-analgesic IV Dose (mg)	Onset (min)	Elimination T $\frac{1}{2}$	Comments
Fentanyl	0.1	1-2	2-4 hr*	Accumulation in hepatic failure, CYP 3A4 substrate
Hydromorphone	1.5	5-10	2-3 hr	Accumulates in hepatic impairment
Morphine	10	5-10	3-4 hr	Accumulation in renal/hepatic impairment, 6- and 3- glucuronide active metabolites, histamine release may cause hypotension and bronchospasm
Remifentanyl	N/A	1-3	3-10 min	No accumulation in renal or hepatic failure; high risk of opioid withdrawal and tolerance

Other Opioid Options

• **Methadone**

- Opioid + NMDA antagonist
- Enteral and IV, IM, SQ injection
- May be useful for recovering ICU patients transitioning off opioid infusions
- Variable T $\frac{1}{2}$ and patient response → caution during initiation or dose increase
- Risk of QTc prolongation

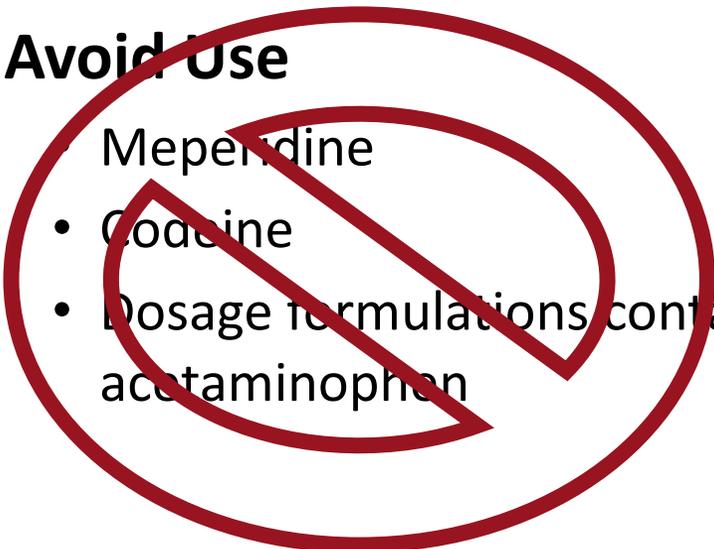
• **Oxycodone IR**

- Only enteral administration available

• **Tramadol**

- Only enteral administration available
- Requires renal dose adjustment
- Wide patient variability in metabolism
- Risk of seizures, serotonin syndrome

• **Avoid Use**

- Meprobamate
 - Codeine
 - Dosage formulations containing acetaminophen
- 

Opioids: All that Glitters Isn't Gold

- Adverse Effects
 - Bowel dysfunction
 - Central nervous system and respiratory depression
 - Hypotension
 - Immune modulation
 - Delirium
 - Pruritis
- Opioid tolerance and hyperalgesia
- Withdrawal symptoms upon discontinuation
- Risk of ongoing opioid dependence/use after ICU

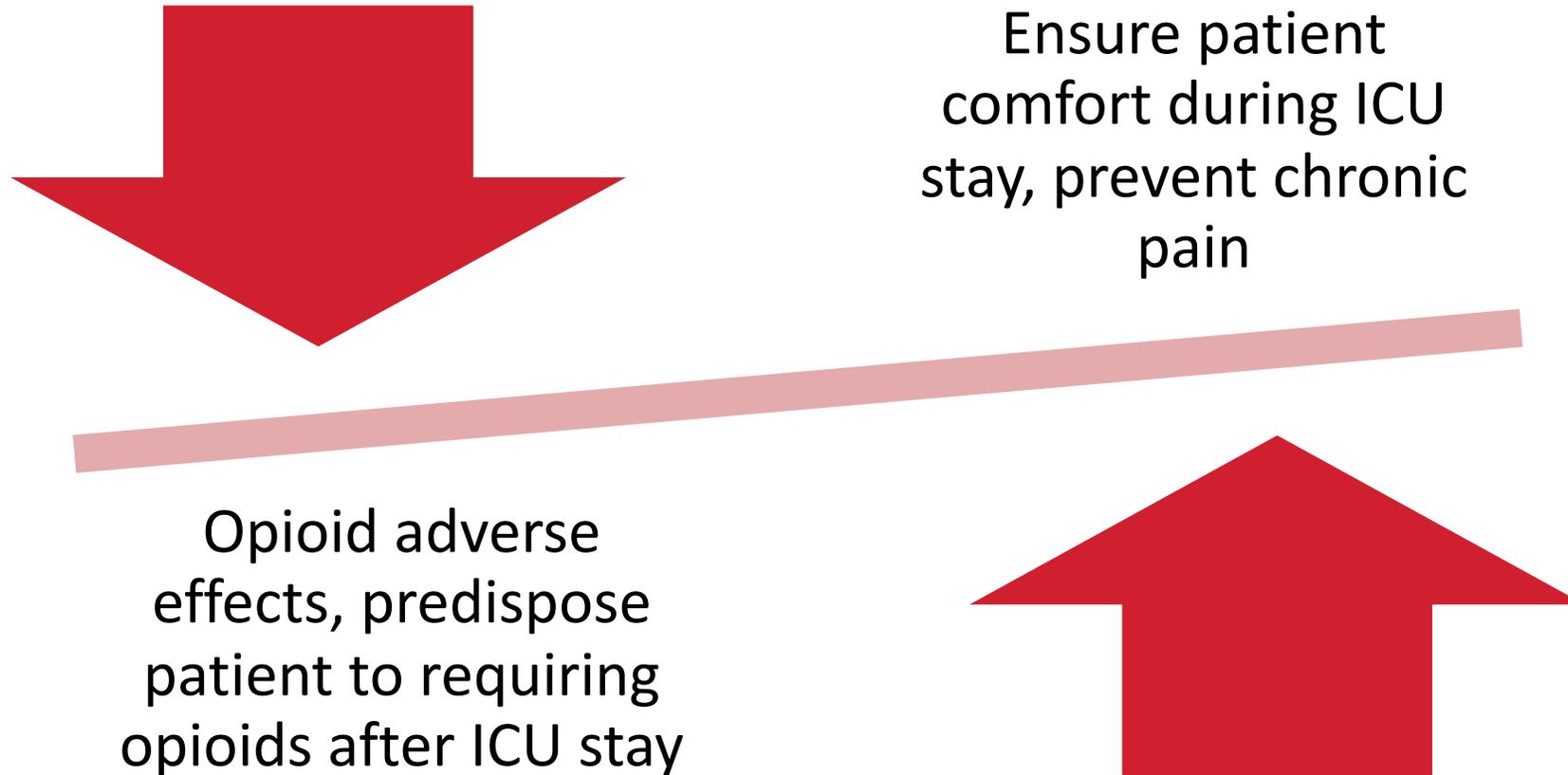
Iatrogenic Opioid Withdrawal

- Abrupt discontinuation of opioids may result in withdrawal
 - 16-32% of opioid treated adult ICU patients
- Risk Factors
 - Cumulative opioid dosage
 - Duration of opioid use
- Signs and symptoms may be non specific and difficult to recognize in a critically ill patient
- Tapering opioids in ICU patients
 - Lack of data in adult population
 - Consider reducing dose by 10% daily

Chronic Opioid Use After ICU Discharge

- Retrospective cohort study evaluating incidence and risk factors for opioid use up to 24 months after ICU admission
 - 204,402 patients admitted to Swedish ICUs from 2010-2018
 - **10.8% of patients developed chronic opioid use**
- Factors associated with subsequent chronic opioid use
 - Older age, female sex, lower education and income level, comorbidities, preadmission opioid use, surgery, earlier year of ICU admission, ICU stay > 2 days, surgery, less critically ill

Analgesia Balancing Act

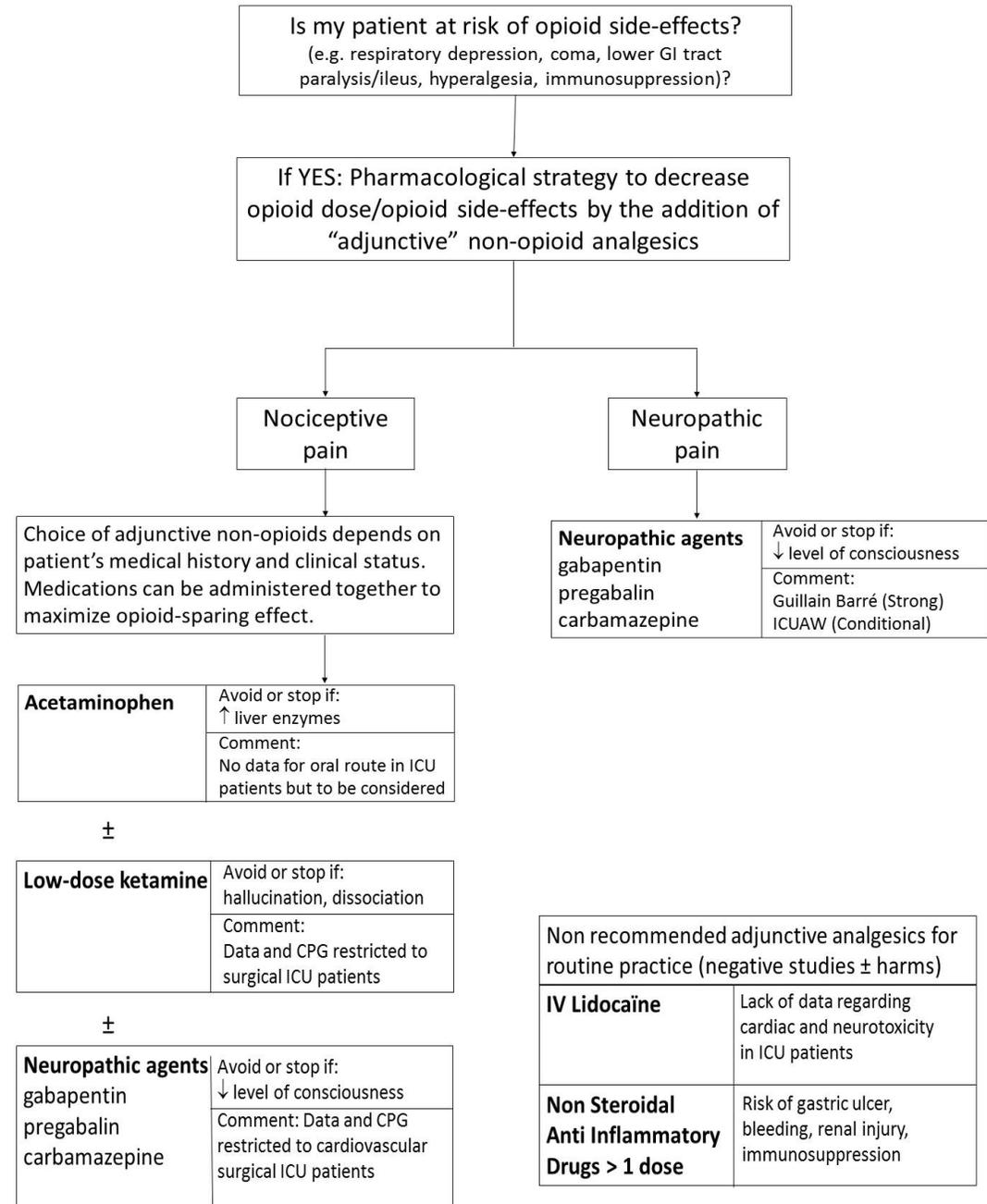


Multimodal Analgesia

- Guidelines recommend utilizing multimodal analgesia when possible
 - Goal is to reduce opioid use while optimizing pain control and improving patient centered outcomes
 - Very limited ICU literature
- Includes nonopioid analgesics ± regional anesthetics ± nonpharmacologic interventions
- Regimens should be patient and symptom specific

PADIS Guideline Algorithm for Adjuvant Analgesics

Less than 1/3 of mechanically ventilated patients receive a non-opioid analgesic!



Improved Pain Scores with Adjuvant Analgesia in Critically Ill Patients

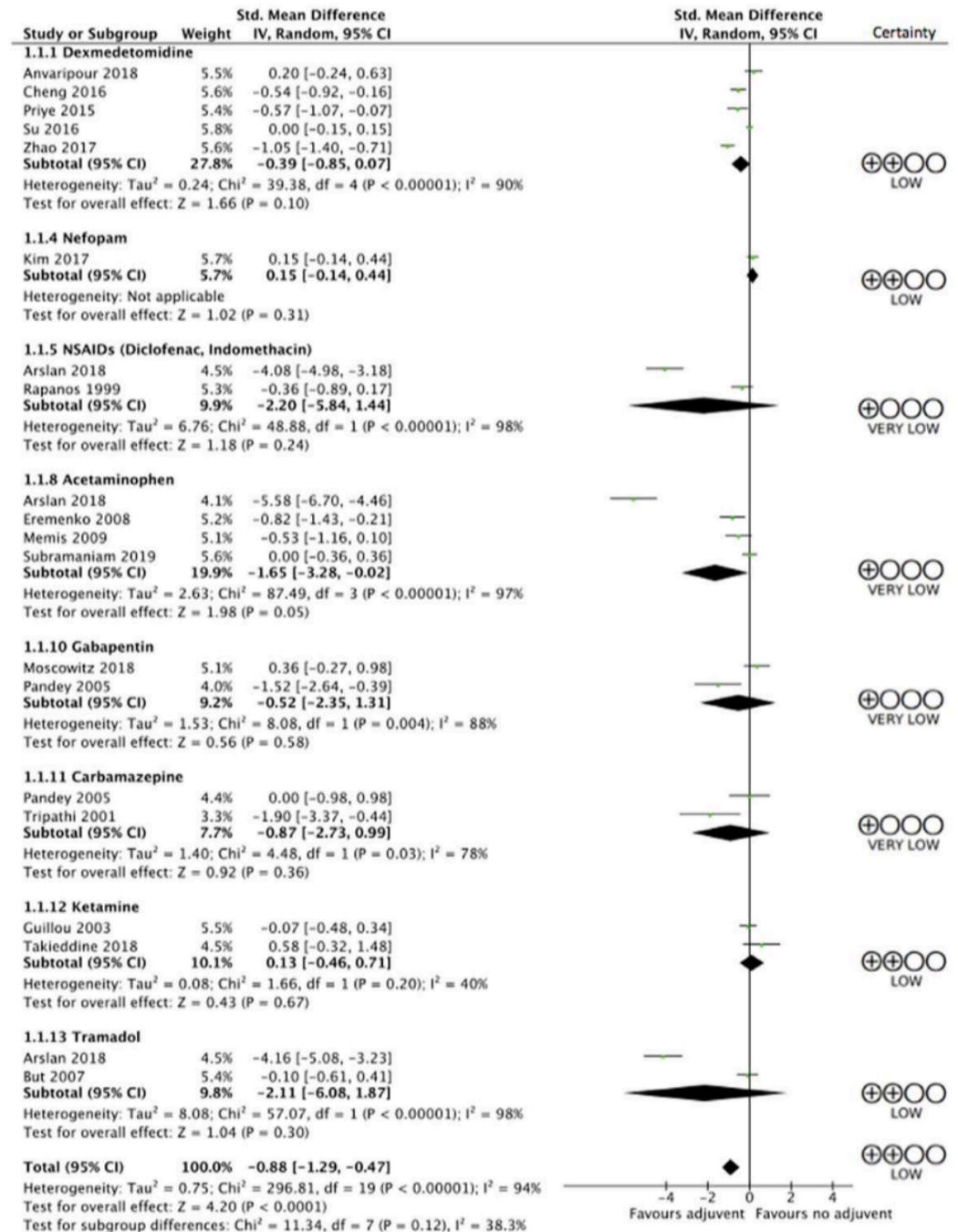
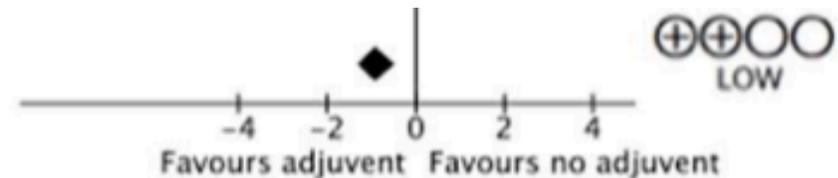


Figure 2. Forest plot of pain scores at 24 hr after intervention. df = degrees of freedom, NSAIDs = nonsteroidal anti-inflammatory drugs.

Improved Pain Scores with Adjuvant Analgesia in Critically Ill Patients

Total (95% CI) 100.0% -0.88 [-1.29, -0.47]
 Heterogeneity: $\tau^2 = 0.75$; $\chi^2 = 296.81$, $df = 19$ ($P < 0.00001$); $I^2 = 94\%$
 Test for overall effect: $Z = 4.20$ ($P < 0.0001$)
 Test for subgroup differences: $\chi^2 = 11.34$, $df = 7$ ($P = 0.12$), $I^2 = 38.3\%$



2. Forest plot of pain scores at 24 hr after intervention. *df* = degrees of freedom, NSAIDs = nonsteroidal anti-inflammatory drugs.

Lower Opioid Requirements with Adjuvant Analgesia in Critically Ill Patients

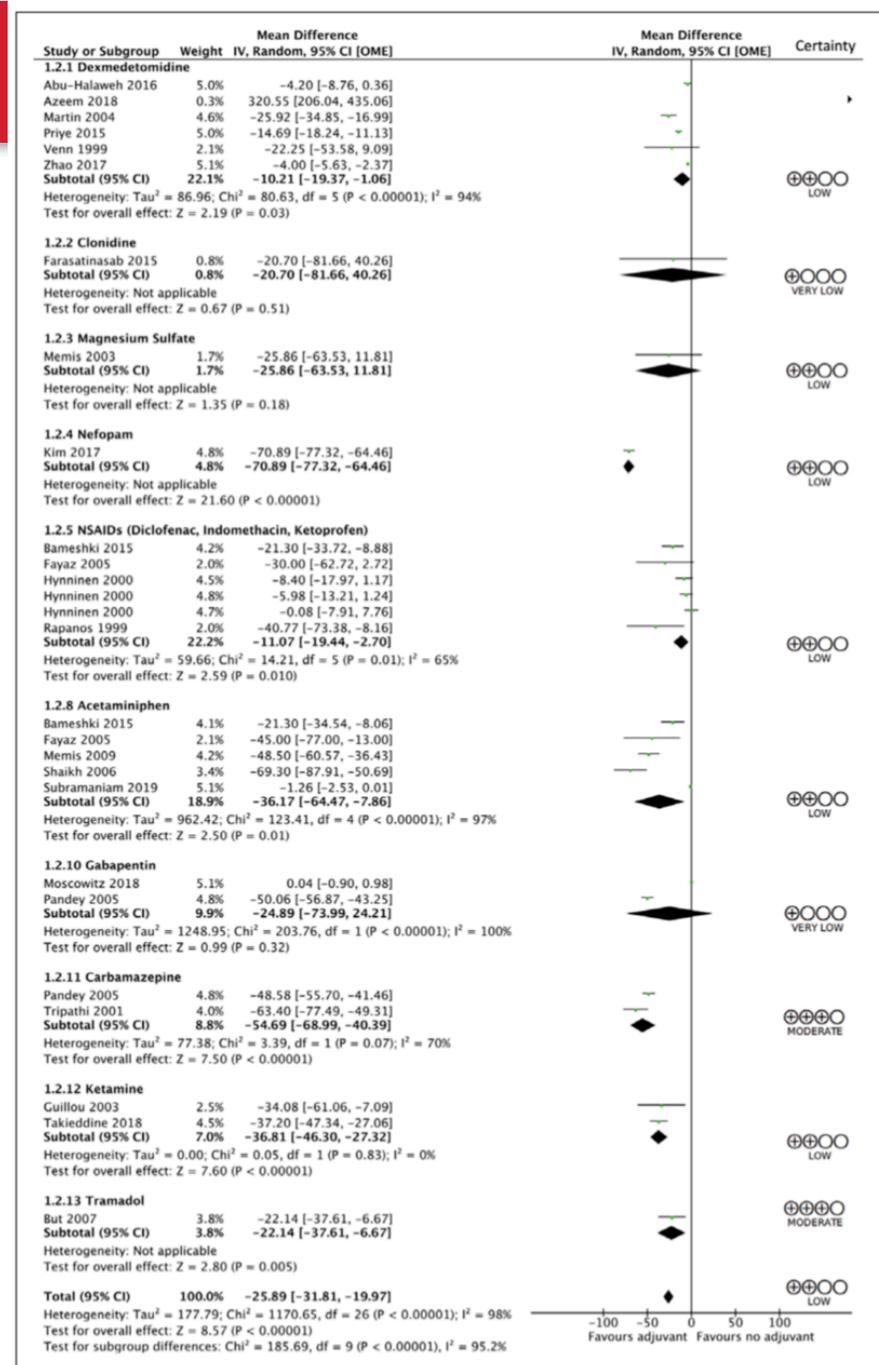


Figure 3. Forest plot of opioid consumption in first 24hr of intervention. *df* = degrees of freedom, OME = oral morphine equivalents.

Lower Opioid Requirements with Adjuvant Analgesia in Critically Ill Patients

Total (95% CI) 100.0% -25.89 [-31.81, -19.97]
 Heterogeneity: $\tau^2 = 177.79$; $\chi^2 = 1170.65$, $df = 26$ ($P < 0.00001$); $I^2 = 98\%$
 Test for overall effect: $Z = 8.57$ ($P < 0.00001$)
 Test for subgroup differences: $\chi^2 = 185.69$, $df = 9$ ($P < 0.00001$), $I^2 = 95.2\%$



Figure 3. Forest plot of opioid consumption in first 24 hr of intervention. *df* = degrees of freedom, OME = oral morphine equivalents.

Adjunctive Analgesics

Analgesic	Dosing	Comments
Acetaminophen IV, PO, PR	1 g Q8H – Q6H	Dose adjust or avoid use with severe hepatic impairment; dose adjust IV formulation in renal impairment, majority of ICU data with IV formulation but often cost prohibitive. IV formulation can cause significant hypotension ~ 30 min after infusion
Alpha-2 Agonists		Can cause significant bradycardia and hypotension.
Dexmedetomidine IV	0.2 – 1.5 mcg/kg/h	May cause rebound/withdrawal symptoms and require dose taper with prolonged use
Clonidine PO	0.1-0.2 mg Q8H	
NSAIDs		Guidelines recommend against routine use except in select patient groups. Limited efficacy/safety data in ICU patients. Many ICU patients at high risk of adverse effects – acute kidney injury, GI bleeding/ulceration, cardiovascular events
Ibuprofen PO	400 mg Q6H	
Ketorolac IV/IM	15-30 mg Q6H (max 5 days)	

Adjunctive Analgesics (cont.)

Analgesic	Dosing	Comments
Ketamine IV	0.5 mg/kg IVP x 1; 1-2 mcg/kg/min	Majority of literature in post-operative patients. Useful in patients with opioid tolerance, difficult to control pain, and hyperalgesia. May cause psychological disturbances at higher doses
Gabapentinoids		Recommended for neuropathic pain and for post-operative pain. Dose must be adjusted in renal impairment. May cause dizziness, somnolence, and additive respiratory depression with opioids
Gabapentin PO	100 - 300 mg PO TID	
Pregabalin PO	75-150 mg PO BID	
Lidocaine IV	1.5mg/kg bolus then 1-2 mg/kg/hr	Guidelines recommend against routine use; however, may consider in select postoperative patients at low risk for toxicity. Avoid use in patients with hepatic dysfunction, seizure disorder, CVD or heart block, hepatic dysfunction

Regional Analgesia

Peripheral Analgesia

- Commonly referred to as “nerve blocks”
- Examples – brachial plexus block, transverse abdominus plane block
- When possible recommend continuous catheter > single injection to prolong analgesic duration
- Anesthesia/pain specialist required

Neuraxial Analgesia

- Epidural analgesia
- Most commonly used for lower abdominal, lower extremity and thoracic surgery/pain
- Catheter based allows for prolonged and titratable analgesia
- Avoid use in hemodynamically unstable or coagulopathic patients.
- Catheter placement/removal limited by antithrombotic therapy
- Anesthesia/pain specialist required

Non-Pharmacologic Therapy

- Psychological support
- Massage
- Physiotherapy
- Music Therapy
- Relaxation techniques
- Cold therapy
 - Recommended before chest tube removal
 - Can using with other painful procedures

Pain Management in the ICU in Patients with Opioid Dependence

- Pain control in patients with pre-existing active opioid use/misuse is often challenging
 - They are at high risk of tolerance, central sensitization, and hyperalgesia
- Need to avoid/treat withdrawal before pain can be treated
 - Additional opioid therapy will generally be needed (in addition to baseline opioid requirement) to treat acute pain
- Utilize multimodal analgesia
- Consider consulting pain/substance abuse specialists

Patient RS

- The nurse determines that RS has a BPS score of 7. What do you recommend?
 - a) Start dexmedetomidine IV infusion at 0.5 mcg/kg/min
 - b) Start acetaminophen 1 g IV Q6H
 - c) Increase fentanyl IV infusion from 12.5 mcg/hr to 100 mcg/hr
 - d) Bolus fentanyl 25 mcg IV and increase IV infusion from 12.5 mcg/hr to 25 mcg/hr

Patient RS

- The following day RS has significantly improved. She remains on norepinephrine at 2 mcg/min and her SCr has decreased to 0.8 mg/dL (1.4 mg/dL yesterday, 0.5 mg/dL at baseline). All other labs have returned to WNL. The team placed an NGT overnight and she is tolerating tube feeds at 10 mL/hr. She remains intubated and is currently receiving fentanyl 50 mcg/hr. She is no longer agitated but her BPS score is 6. What do you recommend for analgesia?
 - a) No changes, a BPS of 6 suggests minimal pain and should not be treated
 - b) Gabapentin 300 mg via NGT TID
 - c) Acetaminophen 1000 mg via NGT Q8H
 - d) Gabapentin 300 mg via NGT TID + Acetaminophen 1000 mg via NGT Q8H

Pain Management in the ICU

Assess

- Use validated pain assessment tools to regularly assess and document pain scores

Treat

- Opioids are the mainstay of treatment but are not *always* needed
- Consider multimodal therapy: non-opioid analgesics and non-pharmacologic treatments
- Always treat pain before adding a sedative

Prevent

- Pre-treat before known painful procedures

Procedural Pain in the ICU

- Results from common ICU interventions and care
 - **Chest tube insertion/removal**
 - **Arterial line insertion**
 - **Wound drain removal/insertion**
 - Suctioning
 - Turning and patient positioning
 - Wound care
 - Mobilization
 - Peripheral IV insertion and blood draws
 - Central line placement/removal
- More severe than pain experienced at rest, often twice the intensity of non-procedural pain

Treatment of Procedural Pain in the ICU

- Patients should have their pain assessed and treated preemptively before many painful procedures (ex – chest tube removal)
 - An opioid at the lowest effective dose can be used
 - **An NSAID may be an appropriate alternative**
 - Time administration so that peak effect coincides with the procedure
- Don't forget about non-pharmacologic options

ICU Pain Management Summary

- Humanistic aspect of medicine
 - Goal is to manage pain as effectively as possible while minimizing risk of short and long-term adverse effects
- **Assess, treat, and prevent pain**
- Assessment and management of pain should be protocol-based and a stepwise approach
 - ALWAYS treat pain before adding a sedative agent
 - Management should incorporate key patient considerations and regimens should be individualized as appropriate



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Samantha Moore, PharmD, BCCCP

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