Advanced Pain Therapy Guideline

Inclusion Criteria: Management of complex acute pain requiring advanced pain therapies. More than the standard PRN or IV scheduled pharmacologic and non-pharmacologic therapies needed for pain control.

Exclusion Criteria: Contraindications for specific therapies – allergy to medication being provided, anatomic abnormalities, history of inadequate relief on such therapies or side effect risks outweighing benefits

- PICU Patients – please refer to Acute Ventilator Sedation Management Protocol
- NICU Patients – please refer to NICU Pain Management Clinical Guideline
- CVICU Patients – please refer to CVICU Pain and Sedation Protocol

This patient population will most often include (but not limited to):

- Acute trauma or illness including surgery with acute post-operative pain, oncologic pain, sickle cell anemia – vaso-occlusive crises or burns/wounds.
- A patient may require more than one advanced pain therapy depending on clinical needs. Please refer to appropriate therapy(s) ordered. Along with policy for reference, as shown below.

Patient-Controlled Analgesia (PCA)

Proceed to Pages 2 - 3

Appendix C

Please refer to Patient Care Policy F929 –

Patient Controlled Analgesia (#PCA)

OnQ Pumps

Proceed to Page 5

Appendix A, B, C

Please refer to Patient Care Policy F916 –

ON-Q Pumps

Epidural

Proceed to Page 4

Appendix B, C, D

Please refer to Patient Care Policy F919 –

Epidural Catheter: Nursing Assessment and Care

Low Dose Ketamine for Analgesia

Proceed to Page 6

Appendix C

Please refer to Patient Care Policy F968 –

Low-Dose Ketamine Infusion for Analgesia

Approved Evidence Based Medicine Committee
9.20.2023

Advanced Pain Therapy Guideline

PCA

Inclusion Criteria: Management of acute pain. Requiring frequent IV opioids for pain control that would benefit from controlled pain relief. School aged and older children with the cognitive and physical ability to push demand button on pediatric inpatient units.

Exclusion Criteria: Inability to independently push demand button. Operation of PCA pumps by nursing staff or family member is prohibited. These practices may cause excessive sedation of the patient by overriding the "patient-controlled mechanisms".

Please review the Caution Statements to the Right →

Caution:

- Basal continuous *not recommended* for opioid naïve patients
- Patients with comorbidities (i.e. renal impairment, hypovolemia, morbid obesity, obstructive sleep apnea)
- Patients with pre-existing conditions that are exacerbated by cardiorespiratory depression (i.e. obesity, OSA, pneumonia, requiring O2 therapy, craniofacial malformation, cardiac disease, polypharmacy, opioid-naïve patients, young age)

Always consider non-opioid adjuncts:

- Acetaminophen, ketorolac
- Alternating and scheduled for opioid sparing and opioid stewardship
- Order bowel program

Opioid Choices and Dosing

- Morphine, Hydromorphone, and Fentanyl
- Starting dose ranges:
  - Morphine: 0.01 - 0.02 mg/kg
  - Hydromorphone: 0.002 - 0.004 mg/kg
  - Fentanyl: 0.2 - 0.4 mcg/kg
- Dosing (opioid naïve):
  - For patients that have had previous opioids, please review previous opioid doses received
  - Giving less opioids will not be helpful
- Basal continuous (**not recommended** for opioid naïve patients),
- Demand - general starting lockout is 10 minutes, loading dose, bolus dose (more than 2 doses in a shift is not recommended–reach out to medical staff to adjust PCA settings for better control)
- For increased or persistent severe pain, re-educate patient on use of PCA
  - If using basal rate, give bolus and consider increasing basal by 10-20%
  - If not using basal, give bolus, and consider adding low basal rate

Assessment / Monitoring

- Independent double checks must be performed and documented by two RN's at the bedside – please refer to Patient Care Policy F929 – Patient-Controlled Analgesia
- Assess and document: pain intensity, location, quality and Pasero Opioid Sedation (POSS) Scale
- Follow PCA orders for vital signs parameters including systolic blood pressure, respiratory rate and O2 saturations
  - Vital signs monitoring: Baseline, Q1hr after starting PCA, after initial 4hrs of monitoring, assess/document Q4
- Pulse oximetry:
  - Continuous pulse oximetry for all continuous infusions
  - If "Demand Only": Continuous pulse oximetry for 1st 24 hours, then spot check with vital signs

Continue to Page 3

Advanced Pain Therapy Guideline

PCA

Interventions

- For respiratory depression, STOP the infusion and treat as outlined–partial reversal dose of naloxone. If cyanotic and unresponsive, stop all opiate infusion, call code white, assist ventilation, and call for naloxone.
  - 0.001 mg/kg IV dosing guideline. For partial opiate reversal, Q1 min prn for respiratory depression until symptoms resolve. Minimum dose 0.01 mg per dose.
- Somnolence - Assess Pasero Opioid Sedation Scale, for a score of 3, an intervention can prevent respiratory depression. If patient on basal rate is over-sedated, decrease basal rate by 50%. If patient is a 4, opioid should be discontinued.
- Oxygen desaturation below ordered parameters, may place oxygen and notify ordering medical staff.
- Weaning - Patients who have been on continuous or around the clock opioid therapy 5 days or longer must be weaned off therapy and monitored for withdrawal symptoms utilizing WAT-1 scale. Please Refer to Patient Care Policy F936.
- Side effects - No significant differences exist in incidences of nausea, vomiting, or pruritus among commonly used opioids. Such side effects mostly depend on total opioid dose and individual tolerance.[4] Patient comorbidities or history of individual sensitivities should guide the selection of the appropriate opioid.

Opioid Induced Side Effects

• **Nausea**	• Ondansetron: 0.1 mg/kg/dose IV Q6 (Max dose - 4 mg) • Granisetron: 10 - 20 mcg/kg/single dose IV (Max dose - 1 mg). Transdermal patch also available.
• **Pruritis**	• Diphenhydramine: 0.5 - 1 mg/kg/dose IV/PO Q6 hours (Max dose - 50 mg) • Naloxone Low Dose Continuous Infusion: 0.25 mcg/kg/hr IV. PRN pruritis, nausea

• **Constipation** **"**Mush and push" (make the stool softer with osmotic laxative (Osm) and stimulate GI with stimulant laxative (Stim)	• MiraLAX (Osm): 0.5 - 1.5 gm/kg/day (Max dose - 17 gms/day)
	• Milk of Magnesia (Osm):
	  • < 2yrs 0.5 ml/kg/dose QHS
	  • 2 - 5yrs - 5 - 15 mL QHS
	  • 6 - 11yrs - 15 - 30 mL QHS
	  • > 12yrs - 60 mL QHS
	• Bisacodyl Suppository (Stim):
	  • 2yrs - 5mg PR QDay
	  • > 2yrs - 10 mg PR QDay
	• Senna Syrup (Stim): 2 - 6yrs - 4.3 mg (1/2 tablet) QHS
	• Senna Tab
	• Colace
	• Peri-Colace

• **Sedation/ Respiratory Depression**	• Obtain Pasero Opioid Sedation (POSS) Scale Score:
	  ○ If pt scores POSS 3, notify ordering medical staff may reduce opioid by 50%
	  ○ If pt scores POSS 4, stop all opioids immediately (Infusion, IV, PO) notify ordering medical staff and consider Naloxone partial reversal

PCA Discontinuation Criteria

- Pain well controlled on IV medications, pain controlled with oral pain medications or not requiring pain medications

Patient and Family Education

- Patient Controlled Analgesia (PCA)

Advanced Pain Therapy Guideline

Epidural

Inclusion Criteria: Lower thoracic, lower abdomen, lower extremity pain related to illness or surgical procedure - admitted to Surgical (3E), Hematology/Oncology (5S) or ICU

Exclusion Criteria:

- Coagulopathies – risk of epidural hematoma
- Active infections – either near the potential epidural insertion site or systemic infection that might "seed" the site
- Known allergies to medication being infused through epidural catheter
- Spinal anatomic abnormalities

Please review the Caution Statements to the Right →

Caution:

- **Only** anesthesia/pain team can change dressing, change tubing, remove, or change orders
- **NO** other sedative or narcotics may be administered unless approved by pain service
- Therapeutic anti-coagulants and thrombolytics, and non-steroidal anti-inflammatory drugs are
- contraindicated **unless**
- approved by pain service

The ONLY 2 local anesthetic Medications that can run in epidural:
Bupivacaine or Ropivacaine

- If an opioid additive (Fentanyl) is used **must** be admitted to PICU for monitoring for duration of opioid in use
- Weight restricted limits of total local anesthetic doses

Max Dosages:

- < 6 months or < 5 kg = 0.2 mg/kg/hr
- > 6 months – 2 years, > 5 kg = 0.3 mg/kg/hr
- > 2 years > 5 kg = 0.4 mg/kg/hr

Recommendations / Considerations

- Alaris pump must be locked at all times. Check locking panel.
- Initial "Volume to be Infused" should be set at 200mL to ensure 250mL bag does not run dry.
- During business hours, contact pain NP or on-call pain attending. After 4pm contact attending who placed catheter. See Appendix B – Page 8

Set-Up

- Dedicated epidural yellow pole and pump ONLY, yellow closed loop tubing ONLY.
- Signs on door and above bed
- Epidural supply kit at bedside at all times (Sterile Gauze & Transpore white tape in plastic bag)

Assessment / Monitoring / Documentation

- Independent double checks must be performed and documented by two RN's at the bedside – please refer to Patient Care Policy F919 – Epidural Catheter: Nursing Assessment and Care
- Assess and document: Vital signs including O2 saturations, Pain intensity, Location, Quality and Pasero Opioid Sedation (POSS) Scale Q2 hours for the first 12hrs then Q4hrs at minimum
- Follow Epidural order parameters for epidural assessment, motor function (Modified Bromage Scale – Appendix C, Page 10), local anesthetic toxicity and abscess or epidural hematoma emergencies

Note:

- Foley catheters, in a patient with epidural infusion, should remain until 6 hours after epidural infusion discontinued. After 6 hours of epidural infusion discontinuation, foley catheter may be removed.
- Ambulation will only be allowed per pain team assessment an approval.

Epidural Concerns and Interventions

- For concerns, reach out to pain NP or pain attending. Epidural may need to discontinue, reinforce dressing, change dressing, stop infusion or change rate. Removal of epidural may be required.
- Local anesthetic toxicity signs/symptoms:
  - Bradycardia
  - Palpitations
  - Hypotension/dizziness/light headedness
  - Blurred vision
  - Ringing/buzzing in ears
  - Metal taste in mouth
  - Numbness/tingling around mouth, fingers, or toes
  - Nausea/vomiting
  - Drowsiness/Sedation/Changes in Mental Status
  - Seizure activity
  - Restlessness
  - Anxiety
  - Itchiness
- Site conditions:
  - Bruising
  - Leaking
  - Redness
  - Swelling
  - Persistent Fevers
  - Break through fever when on scheduled or administered anti-pyrectics
- Motor block – unable to move lower extremity, wiggles toes (Modified Bromage Scale - 1 or 2)

Epidural Discontinuation Criteria

- Pain can be controlled by alternative therapies

Patient and Family Education

- Epidural

Advanced Pain Therapy Guideline

OnQ – C BLOC Nerve

Inclusion Criteria: Extremity illness or surgery
Exclusion Criteria: Allergy to medication running in pump, active infection

Please review the Caution Statements to the Right →

Medications / Dosing

- Bupivacaine or Ropivacaine-See Appendix A on Page 7 for calculations
- Target and maximum rate of anesthetic agent by age:
  - 1 month – 6 months of age: 0.2 mg/kg/hr
  - > 6 months of age: 0.4 mg/kg/hr

Set-Up

- Placed by anesthesiologist, automatic and continuous delivery of regulated flow of local anesthetic alongside appropriate nerve. unclamped, key out, labeled
- Pump delivers numbing medicine over 2-5 days. Patient/family may remove at home.
- It's normal for dressing to have small amount of leakage or drainage. Do not put tape over filter.
- No medication may be injected into either On-Q pump. 2 RN verification/Safety check
- TIPS: place in black storage pouch
- Labels – place distally and proximally
- Verify flow controller is set at correct rate ⇨ Remove key ⇨ Ensure flow controller lid is securely locked with zip tie ⇨ Verify tubing is clamp is open, assess for kinks

Assessment / Monitoring

- Signs and symptoms of local anesthetic toxicity: difficultly breathing, blurred vision, ringing or buzzing in ears, metal taste in mouth, dizziness or lightheaded ness, drowsiness or confusion.
- Signs and symptoms of infection – redness, warmth, pain swelling, fevers, chills, sweats
- Vital Signs: Minimum Q4

Interventions

May need to discontinue, reinforce dressing, change dressing, stop infusion or change rate. Removal of OnQ may be required. Reach out to pain NP or pain attending.

- **Local anesthetic toxicity signs/symptoms**: bradycardia, palpitations, hypotension/ dizziness/light headedness, blurred vision, ringing/buzzing in ears, metal taste in mouth, numbness/tingling around mouth/fingers/toes, nausea/vomiting, drowsiness/sedation/ changes in mental status, seizure activity, restlessness, anxiety, itchiness.
- **Site conditions:** bruising, leaking, redness, swelling, or persistent fevers, breaking through with fevers on scheduled or administered anti-pyrectics.
- **Motor block:** unable to move extremity

On-Q Discontinuation Criteria

- Pain controlled on alternative therapies or reached max placement of 5 days
- Patient may be discharged home with device in place and with oral pain medications per surgeon preference

Recommendations / Considerations

- Do not squeeze the pump.
- Keep the pump dry. Carefully dry the pump if it gets wet.
- No tub bath while pump is in place.
- If patient is allowed to shower, while the pump is in place, cover the filter with plastic wrap and tape to keep dry, when done with shower, remove the plastic wrap placed.
- Notify medical staff if tubing comes out before medicine is gone.
- During business hours, contact pain NP or on-call pain attending. After 4pm, contact attending who placed catheter – see Appendix B on Page 8.

Patient and Family Education

- On-Q Pain Relief System

Low-Dose Ketamine Infusion for Analgesia

Inclusion Criteria:
- Suspected or potential opioid induced hyperalgesia
- Acute pain in patients on chronic high dose opioids
- Neuropathic pain resistant to standard treatments
- Patients with cancer and chronic opioid requirements
- As a component of palliative or end of life care for analgesia

Exclusion Criteria:
- Allergy to ketamine
- Liver failure
- Myocardial ischemia
- < 3 years of age

Please review the Caution Statements to the Right →

Caution in patients with:
- Uncontrolled hypertension
- Severe hypovolemia
- Psychotic disorders
- Increased ICP in patients not receiving mechanical ventilation
- Cerebral vascular disease and aneurysms
- Renal or hepatic impairment (dose reduction maybe required)
- Cardiac failure
- Pulmonary hypertension
- Poorly controlled seizure disorders
- Thyrotoxicosis

Pre-assessment
- Obtain baseline vital signs including SP02 and sedation score prior to start of infusion.
- Continuous pulse oximetry and cardiorespiratory monitoring.

Dosing

Analgesia

Continuous Infusion
- *Recommended Starting Dose:* 0.05 – 0.1 mg/kg/hr
- *Dosing Range:* 0.05 – 0.3 mg/kg/hr – unless permission given by Pain Management or Palliative Care Teams.
- *Maximum Suggested Dose:* 40 mg/hr - unless permission given by Pain Management or Palliative Care Teams.

End of Life Care

Continuous Infusion
- *Recommended Starting Dose:* 0.05 – 0.1 mg/kg/hr
- Dosing is based on titration to clinical effect/comfort and to avoid occurrence of any undesirable dose limiting side effects.
- Maximal doses will be determined per patient's clinic effect, by the palliative care team.

Recommendations/Considerations

Treatment or prevention of excessive oral secretions:
- *Recommend:* glycopyrrolate
- *Starting dose:* 0.004 mg/kg/dose IV every 6 hours as needed for hypersalivation.
- IV dose may be increased to a maximum of 0.01 mg/kg/dose (1.5 mg/dose maximum) or 20–40 mcg/kg/dose PO every 6-8 hours.

- Frequency of assessment may be increased based on the patients'' response to the ketamine infusion.

Assessment
- Assess and document respiratory rate, SPO2 and sedation score every 30 minutes x 2, then 1 hour x 1, then Q4 hours after starting ketamine infusion.
- For CHOC ketamine titrations in rate: Q30min x 2, then Q4hrs.
- Monitor for possible side effects including:
  - Fatigue
  - Drowsiness
  - Dizziness
  - Vivid dreams
  - Misperceptions or confusion
  - Hallucinations

❖ **Ketamine infusions and titrations are only started during the hours while Pain Service is physically available.**

Refer to Patient Care Policy F968: Low-Dose Ketamine Infusion for Analgesia

Interventions

If patient experiences dysphoria or hallucinations:
- Reduce dose of ketamine and prescribe benzodiazepine (e.g. lorazepam 0.025 mg/kg every 12 hours)
- Consider scheduled low-dose benzodiazepines (lorazepam 0.03 – 0.05 mg/kg/dose IV every 6 hours) to prevent or mitigate psychomimetic side effects, if they occur.

Patient and Family Education
- Low-Dose Ketamine Infusion: Patient/Family Education

Low-Dose Ketamine Discontinuation Criteria
- Completion of weaning protocol for patients on infusion greater than 5 days.
- Successful transition to oral regimen and maintained for 24 hours.

Appendix A

Dose Calculation

Targeted rate is not to exceed 0.2 mg/kg/hr bupivicaine for infants 1 month to 6 months of age. Targeted rate is not to exceed 0.4 mg/kg/hr bupivicaine for patients > 6 months of age. The use of the On-Q device is NOT recommended in neonates.

Calculating the dose may be done by:
(Bupivicaine percentage x 10 x flow rate) ÷ patient weight in kg = bupivicaine mg/kg/hr.

Example 1:
A 9 year old patient weighing 28 kg arrives at your unit with a double lumen On-Q (subcutaneous) system in place. Each lumen is infusing at 2 mL/hr. The On-Q (subcutaneous) pump is labeled as containing bupivicaine 0.25%.
(Bupivicaine percentage x 10 x flow rate) ÷ patient weight in kg = bupivicaine mg/kg/hr
(0.25 x 10 x 4*) ÷ 28 = 0.357 mg/kg/hour
Maximum rate allowed for this patient is bupivicaine 0.4 mg/kg/hr. Dose is appropriate.
*Attention to the number of lumens infusing is very important. This patient has 2 lumens each at 2 mL/hr so total hourly flow rate is 4 mL.

Example 2:
A 4 month old infant weighing 7.3 kg arrives at your unit with a single lumen On-Q (subcutaneous) system in place. The lumen is infusing at 0.5 mL/hr. The On-Q (subcutaneous) pump is labeled as containing bupivicaine 0.25%.
(Bupivicaine percentage x 10 x flow rate) ÷ patient weight in kg = bupivicaine mg/kg/hr
(0.25 x 10 x 0.5) ÷ 7.3 = 0.17 mg/kg/hr
Maximum rate allowed for this patient is bupivicaine 0.2 mg/kg/hr. Dose is appropriate.

Example 3:
A 5 year old patient weighing 17.7 kg arrives at your unit with a double lumen On-Q (subcutaneous) system in place. Each lumen is infusing 2 mL/hr. The On-Q (subcutaneous) pump is labeled as containing bupivicaine 0.25%.
(Bupivicaine percentage x 10 x flow rate) ÷ patient weight in kg = bupivicaine mg/kg/hr
(0.25 x 10 x 4) ÷ 17.7 = 0.564 mg/kg/hour
Maximum rate allowed for this patient is bupivicaine 0.4 mg/kg/hr. Dose exceeds limit. Clamp lumens from the On-Q (subcutaneous) pump and notify the surgeon. Assess for bupivicaine toxicity. A safety report must be completed.

CHOC

Patient Label

PACU – Epidural/OnQ Catheter Information

Not a part of permanent medical record, please place in chart to follow patient during inpatient stay.
Please contact Pain APN, Sue Park for any epidurals/OnQ catheters coming out PACU during business hours.

Date placed: ___/____/_____

Placed by (anesthesia attending): _____
Pager (or contact) #: _____
Please contact this attending after 4 pm. and on weekends.

Location of EPIDURAL placement: ☐ thoracic level _____
☐ lumbar level _____
☐ caudal level

Location of OnQ (C-bloc) catheter placement:
☐ Femoral ☐Infraclavicular ☐Sciatic ☐Adductor Canal ☐Other _____

Medication infusing: ☐ bupivacaine _____% at _____mL/hr
+ ☐ Fentanyl 2mcg/ml
☐ ropivacaine _____% at _____mL/hr
+ ☐ Fentanyl 2mcg/ml
☐ other _____% at _____mL/hr
+ ☐ Fentanyl 2mcg/ml

During business hours (Monday-Friday, 8 am - 4 pm)
please notify Sue Park, Pain NP (Voalte/PingMD) or on-call pain attending
for questions/concerns regarding epidural/OnQ catheter (leaking, site infection, uncontrolled pain, etc).

After 4 pm (weekdays) and weekends, notify anesthesiologist who placed catheter via pager/contact number as listed above.

*If unable to get a hold of attending who placed catheter, **may** contact OR control desk, ext.19190 for alternate communication options or speak with on-call anesthesiologist.*

Please refer to Epidural Catheter Policy (F919) or ON-Q Pump Policy (F916) for guidance.

Advanced Pain Therapy Guideline

Appendix C

Pasero Opioid-Induced Sedation Scale (POSS)

S = Sleep; easy to arouse

Acceptable, no action necessary, may increase opioid dose if needed

1 = Awake and alert

Acceptable; no action necessary; may increase opioid dose if needed

3 = Frequently drowsy but arousable; drifts off to sleep during conversation

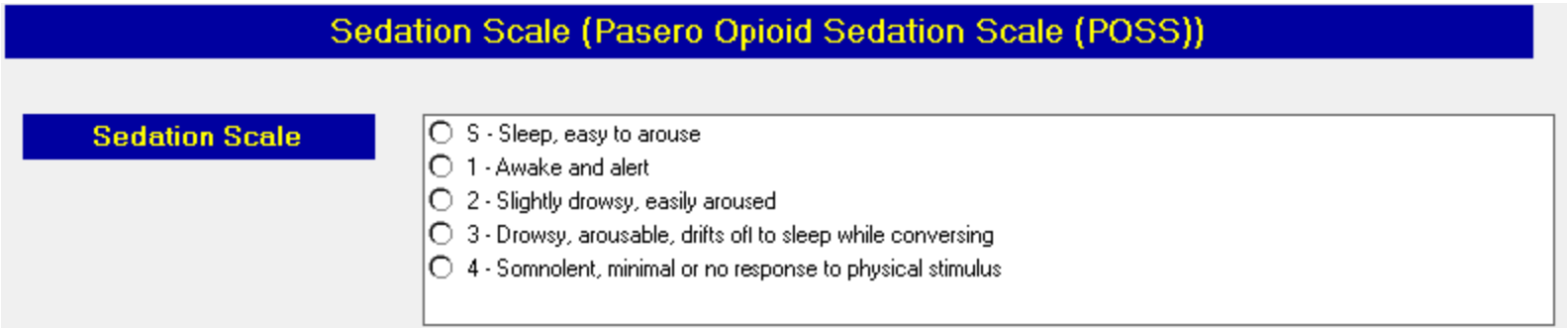
Possibly unacceptable:

- Notify prescriber or anesthesiology; may need to decrease opioid dose 25% for slower onset of drowsiness (>4 hours after dose increase) and to 50% for more rapid onset drowsiness (1-4 hours after dose increase)
- For pain control can consider administering a non-sedating opioid-sparing nonopioid, such as acetaminophen or a NSAID, if not contraindicated.
- Place on continuous pulse oximetry ad respiratory monitor. Monitor respiratory status and sedation level (ever 30 minutes) until sedation level is stable at less than 3 and respiratory status is back to baseline

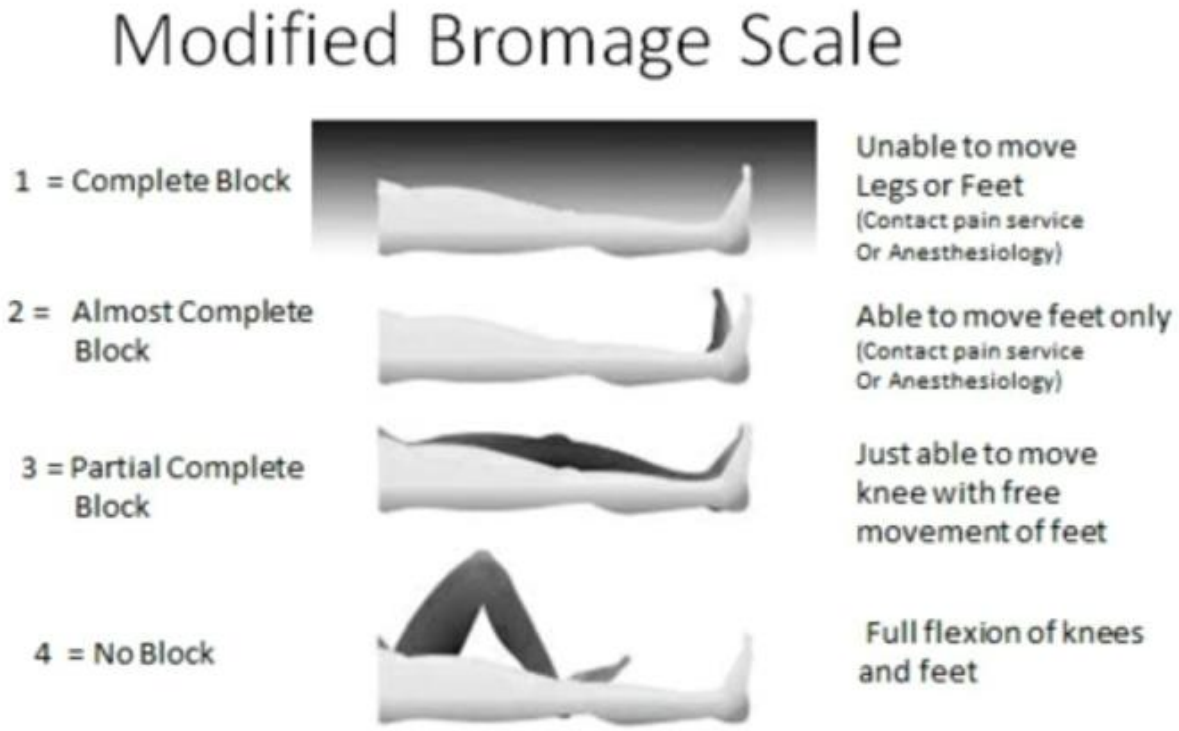
4 = Somnolent; minimal or no response to physical stimulation

Unacceptable

- STOP opioid
- Consider administering naloxone
- Stay with patient, stimulate ad support respiration as indicated by patient status & call Rapid Response Team if indicated
- Notify prescriber or anesthesiologist
- Continuously monitor respiratory status and sedation level until sedation level is stable at less than 3 and respiratory status is back to baseline



MODIFIED BROMAGE SCALE



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