

VANDERBILT  UNIVERSITY
MEDICAL CENTER

Guideline: Pediatric Burn Pain Management

Revised Date: March 2025

Review Date: March 2027

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I. Purpose

To establish a comprehensive approach to the needs of pediatric burn patients who experience pain and anxiety.

II. Population and Injury Characteristics

This protocol applies to the pediatric patients with burn injuries seen in Monroe Carell Jr. Children's Hospital at Vanderbilt (Monroe Carell) that experience pain and anxiety.

III. Assessment

- a. Patient rights include an assessment and appropriate management of pain. This right is addressed in the following ways:
 - i. Included in the Patient Bill of Rights, which is provided to each patient upon admission to the hospital and posted in each outpatient practice area;
 - ii. Included in patient teaching at the time of patient admission; and
 - iii. Included in Discharge Instructions.
- b. Pain management is a multidisciplinary responsibility:
 - i. The patient's physician or other provider with prescriptive privileges is responsible to develop a plan and prescribe medications based on the patient's medical condition.
 - ii. RNs have responsibility for evaluating the effectiveness of pain management in the inpatient setting, to include the assessment of pain.
 - iii. Specialized consultative services are available to assist in pain management.
- c. Determination of Pain:
 - i. Pain scales are age specific and in accordance with cultural and barrier findings. Pain scales may include assessment for behavioral cues, vocalization, nonverbal/verbal/physiologic cues of discomfort:
 1. Numeric;
 2. Wong-Baker Faces Scale;
 3. Neonatal Pain Agitation Sedation Scale (N-PASS);
 4. Neonatal Infant Pain Scale (NIPS); and
 5. Face, Legs, Activity, Cry, and Consolability (FLACC)
 - ii. Alternate methods of evaluating pain include, but are not limited to the following:
 1. Assume pain is present. For patients who are unable to communicate and who are experiencing conditions, problems or procedures known to cause pain, the nurse may assume that pain is present and consider appropriate interventions.
 2. Surrogate report (as deemed appropriate by health care team).
 - iii. The pain intensity goal is established in collaboration with the patient, when possible, during initial comprehensive assessment using a numeric score. This goal will help the providers evaluate the effectiveness of pain interventions.
- d. Frequency of pain assessment
 - i. Initial pain screening addresses current and/or recent pain. This screening is performed:
 1. Upon admission to the hospital;
 2. During initial assessment and triage in the Emergency Department (ED); and
 3. During preoperative evaluation or prior to going to any tests or procedures.
 - ii. Ongoing screening/assessment is performed at a frequency based on the patient's condition and type/route of pharmacologic intervention. Existing unit protocols should be followed.

IV. Types of Pain

Patients with burns can experience multiple types of pain:

- a. Basal or background pain that is secondary to their burn injury. This is an inflammatory nociceptive pain that is constant and exacerbated by movement or interventions. This pain is best treated by a scheduled, multimodal regimen. Long-acting opioids can be considered to decrease the total amount of opioid required, including for procedural pain, and can reduce hemodynamic instability.
- b. Procedural or interventional pain is experienced with wound care, therapy, or other interventions. This pain is treated with anticipatory dosing of opioids either enterally (preferred) or parentally. For extensive procedures or for significant pain and/or anxiety, procedural sedation may be required.
- c. Breakthrough pain is the more intense, episodic pain associated with activities of daily living and other minor activities. This pain can be well addressed with a multimodal analgesic regimen, which can include opioids, NSAIDs, acetaminophen, and other analgesics.
- d. Neuropathic pain and itch: This pain is the burning, pins and needles, throbbing pain related to nerve inflammation and injury caused by the burn. This pain is not well treated with opioids and is better addressed with neuropathic agents.
- e. Anxiety: While not a type of pain, anxiety can worsen a patient's pain experience and pain can also exacerbate anxiety. As such, anxiety needs to be addressed.

V. Treatment

Use a multimodal approach to maximize pain relief while minimizing risks and side effects. Select interventions based on evidence of best practices.

a. Pharmacologic interventions

The following is the ideal regimen for a burn patient based on existing evidence. Patients with contraindications to any of these medications should not receive them.

i. Basal regimen

1. Scheduled medications

- a. Acetaminophen (Tylenol) 15mg/kg (max 100mg) PO q6h scheduled
- b. NSAID: This should be avoided in renal impairment, high risk of gastrointestinal bleed, expected prolonged NPO time.
 - i. ibuprofen 10mg/kg (max 600mg) PO q6h scheduled (preferred)

OR

- ii. ketorolac 0.5mg/kg (max 30mg) IV q6h

When ordered as a scheduled medication, famotidine should be scheduled for stress ulcer prophylaxis:

- i. <3mo: Oral 0.5mg/kg once daily or IV 0.25mg/kg once daily
 - ii. 3-12mo: Oral 0.5mg/kg twice daily (max 20mg/dose) or IV 0.25mg/kg twice daily (max 20mg/dose)
 - iii. >12mo: Oral 0.5mg/kg twice daily (max 40mg/dose) or IV 0.25mg/kg twice daily (max 20mg/dose)
- c. Cetirizine nightly scheduled
 - i. 6mo-5yo: 2.5mg qHS
 - ii. 6-11yo: 5-10mg qHS
 - iii. ≥12yo: 10mg qHS
 - d. Burns ≥15% **ADD**
 - i. Gabapentin 5mg/kg (max 300mg) PO TID scheduled
 - ii. Clonidine
 1. 2-10yo: 0.05mg/day patch (half 0.1mg patch)
 2. >10yo: 0.1mg/day patch
 - e. Burns ≥30% TBSA **ADD**
 - i. Methadone 0.1mg/kg (max 5mg) PO TID scheduled

2. Unscheduled medications

- a. First line: Oxycodone 0.15mg/kg (max 10mg) PO q4hr PRN
 - b. Second line: Hydromorphone 0.015mg/kg (max 0.2mg) IV q3hr PRN
- ii. Breakthrough Pain
1. Step 1: Optimize basal regimen with scheduled non-narcotics
 2. Step 2: Change ibuprofen to ketorolac 0.5mg/kg IV q6h scheduled for a maximum of 3 days
 - a. *Alternatively, if ≥ 2 yo, can consider replacing ibuprofen with celecoxib, particularly if NPO or expecting long-term use*
 - i. 10-25kg: 50mg PO q12h
 - ii. 25-50kg: 100mg PO q12h
 - iii. >50kg: 100-200mg PO q12h
 3. Step 3: Increase the opioid PRN dose and/or frequency
 4. Step 4: Replace PRN opioids with PCS: hydromorphone (preferred) or morphine. Start with demand dose only
 5. Step 5: Consult Inpatient Pediatric Pain Service
The pediatric pain service can be consulted earlier in the process to assist with uncontrolled pain. They can also explore the option of providing a nerve block for patients with extremity or mid-abdomen and below burn involvement. This is particularly useful for patients with donor site pain.
- iii. Procedural Pain & Anxiety
1. If the patient requires sedation, the inpatient procedural sedation team should be consulted. The patient must meet the safety criteria outlined in the Pediatric Sedation guideline; should they not meet the criteria, the patient will need sedation by the anesthesia team.
 2. If the patient does not require sedation, pharmacologic interventions must meet the guidelines of the unit where the patient is located (i.e. PICU, acute care). Of note, fentanyl may not be administered on the acute care floors.
 - a. PICU: Per PICU provider
 - b. Acute care unit: May administer **one** of the following procedural pain or anxiety medications in addition to a previously tolerated PRN or scheduled regimen.
 - i. Midazolam 0.5-1mg/kg (max 20mg) PO
 - ii. Midazolam 0.1mg/kg (max 2mg) IV
 - iii. Lorazepam 0.05mg/kg (max 4mg) PO
 - iv. Diazepam 0.05-0.1mg/kg (max 5mg) PO/IV
 - v. Oxycodone 0.2mg/kg (up to 10mg) PO
 - vi. Hydromorphone 0.015mg/kg (up to 0.2mg) IV
 - vii. Morphine 0.05mg/kg (max 5mg) IV
- iv. Breakthrough Anxiety
1. Procedural: see above
 2. Sustained: If less than 2yo, consult Pediatric Psychiatry for assistance. If ≥ 2 yo, the following may be considered prior to consulting Pediatric Psychiatry
 - a. Step 1: Optimize clonidine
 - i. If not already started:
2-10yo: 0.05mg/day patch (half 0.1mg patch)
>10yo: 0.1mg/day patch
 - ii. If already started, increase dose:
2-10yo: 0.1mg/day patch
>10yo: 0.2mg/day patch
 - b. Step 2: If delirium screening is positive, consult Pediatric Psychiatry. If delirium screening is negative, consider adding a PRN benzodiazepine:
 - i. Diazepam 0.1mg/kg (max 5mg) q6h PRN
 - ii. Lorazepam 0.05mg/kg (max 2mg) PO q6h PRN

- c. Step 3: Consult Pediatric Psychiatry
- v. Neuropathic Pain
 1. Pain with itching
 - a. Start gabapentin 5mg/kg (max 300mg) PO TID
 - b. Increase gabapentin by ~2.5mg/kg/dose every 1-2 days to effective dose (max 1200mg)
 - c. Consider tricyclic antidepressant (TCA) (*Must obtain EKG before initiating.*)
 2. Itching without pain
 - a. Increase cetirizine if able and add hydroxyzine PRN
 - b. Schedule hydroxyzine
 - c. Add diphenhydramine PRN (*Use caution with presence/high risk of delirium.*)
- vi. Therapy Interventions

Patients experiencing pain and/or anxiety with therapy interventions may utilize PRNs for improving tolerance. When current PRNs are not sufficient for patients to participate in therapy, consider adapting the PRN regimen using the guidelines above.
- b. **Nonpharmacologic Interventions**

All pediatric burn patients should receive a consult for Child Life and Pediatric Psychology on admission, regardless of the admitting unit. The Pediatric Psychologist and Child Life Specialist will aim to complete the initial assessment within 24 hours. The presence of the Child life Specialist for planned interventions (i.e. dressing changes) significantly enhances the patient tolerance of the procedure. Additional considerations for nonpharmacologic pain and anxiety management include:

 - i. Animal Therapy
 - ii. Music Therapy
 - iii. Board Certified Behavioral Analyst (BCBA)
 1. *Particularly useful for patients who have autism, intellectual disability, and/or behaviors that interfere with safety/treatment (i.e. severe self-injury, picking at skin that interferes with healing).*

VI. Pharmacologic Weaning

Daily assessment of pain/anxiety weaning readiness is essential as the patient nears operative complete phases of care and wounds begin to heal. The following are guidelines for weaning regimens while monitoring the patient's response and exacerbation of symptoms:

- a. Methadone/clonidine: wean by 10-20% of original dose every 2-3 days
- b. Gabapentin:
 - i. $\leq 5\text{mg/kg}$ TID dosing: wean to BID for 7 days, then daily for 7 days, then off
 - ii. $> 5\text{mg/kg}$ TID dosing: discuss with Pediatric Pain service
- c. All other medications may be weaned to PRN, decreasing frequency, then off.

VII. Patient/Family Education and Engagement

The patient and family are educated at the level of their understanding regarding the following:

- a. How and when to request interventions for comfort/symptom relief;
- b. Pain scale in use, as well as the pain intensity goal;
- c. Realistic expectations of their pain goal with consideration of current illness; and
- d. Pain management discharge planning:
 - i. Detail the interventions patients and families can utilize to manage pain following hospitalization.
 - ii. Provide a contact and telephone number for questions or problems.

VIII. Documentation

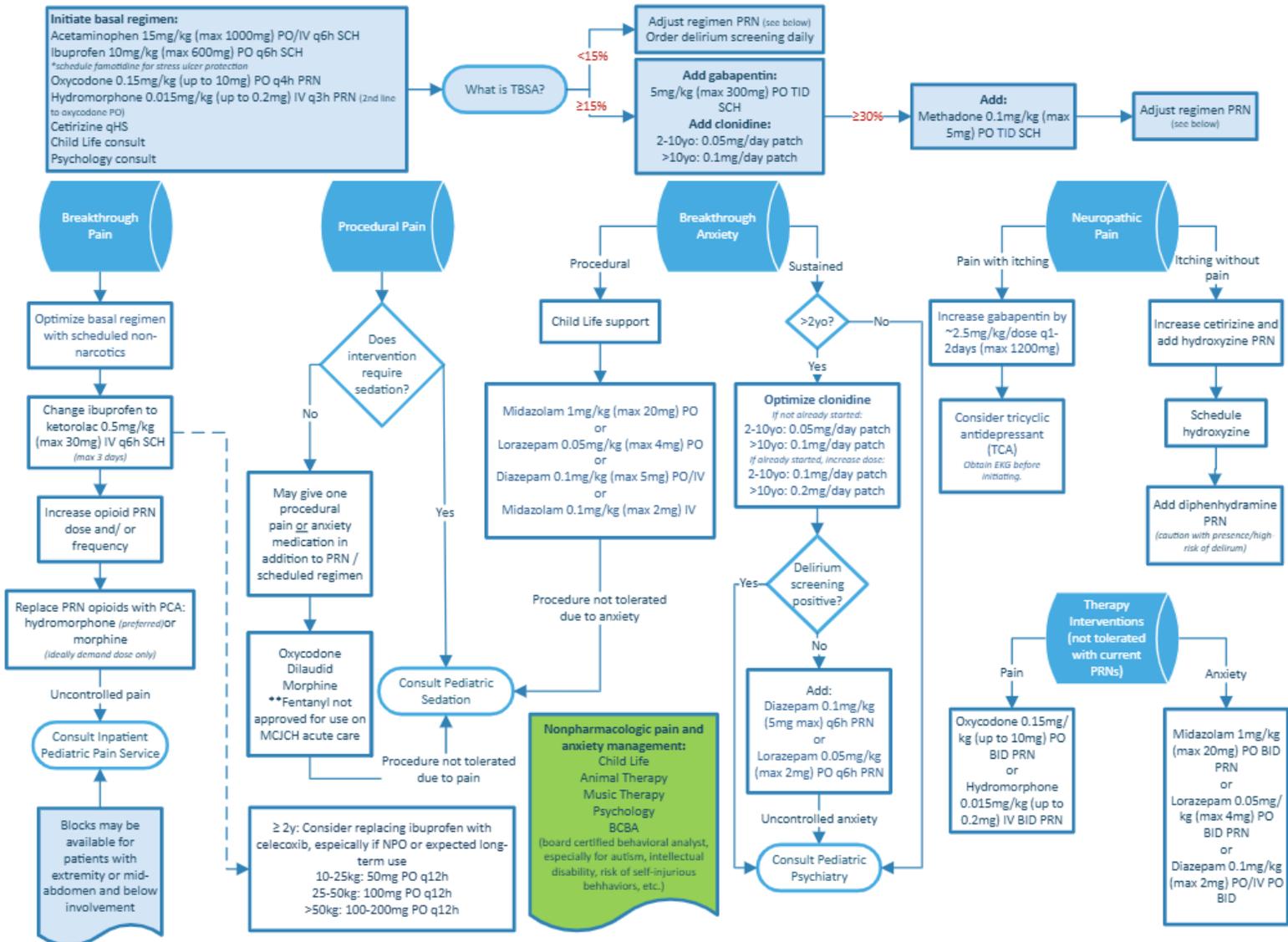
In Inpatient areas, document the following with date and time:

- Pain screening, on the Admission History form within eight hours of admission.
- Pain screening/assessment and documentation at least once each shift and when there is a change in the patient's condition or primary caregiver.
- Reassessment of pain response to interventions is documented at an interval based on patient condition and type and route of pharmacologic intervention.
- Patient/family teaching regarding pain management.
- Discharge instructions regarding pain management.

Appendix I: Algorithms

[CPG] Pediatric burn pain management.pdf

Pediatric Burn Pain Management Guideline



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