Model EMS Protocol for Prehospital Pain Management

May 2021

Evidence-Based Guideline for Prehospital Pain Management (693JJ92050003)

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Submitted to NHTSA Office of EMS, May 13, 2021 in fulfillment of

Item 8. Condition 6. Submit Draft EMS Protocol

Cooperative Agreement No. 693JJ92050003

Pain Management

(Incorporates elements of an evidence-based guideline for prehospital analgesia in trauma and evidence-based guidelines for prehospital pain management created using the National Prehospital Evidence-Based Guideline Model Process)

Aliases

Analgesia, pain control, acute pain, acute traumatic pain, acute atraumatic pain

Patient Care Goals

The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. Approaches to pain relief must be designed to be safe and effective in the dynamic prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the urgency and extent of analgesic interventions.

Patient Presentation

Inclusion Criteria

Patients who are experiencing pain

Exclusion Criteria

1. Pregnancy with active labor
2. Patients with care-plans that prohibit use of parenteral analgesics by EMS

Patient Management

Assessment, Treatment, and Interventions

1. Determine patient's pain score assessment using standard pain scale.
    a. Less than 4 years old: Observational scale (e.g. Faces, Legs, Arms, Cry, Consolablity [FLACC] or Children's Hospital of Eastern Ontario Pain Scale (CHEOPS)
    b. 4-12 years old: Self-report scale (e.g. Wong Baker Faces, Faces Pain Scale [FPS], Faces Pain Scale Revised [FPS-R])
    c. Greater than 12 years old: Self-report scale (Numeric Rating Scale [NRS])
2. Consider initial use of non-pharmaceutical pain management techniques
    a. Placement of the patient in a position of comfort
    b. Application of ice packs and/or splints for pain secondary to trauma
    c. Verbal reassurance or distraction to minimize anxiety
    d. For children, caregiver presence to the degree allowed by required clinical care and caregiver comfort
3. If non-pharmaceutical techniques are not sufficient to relieve pain, then consider use of non-IV analgesics
    a. PO options (for milder pain with the understanding that onset of action will be slower than IN/IM/IV or if there is a desire to avoid parenteral medications and/or opioids)
        i. Acetaminophen 15 mg/kg PO (maximum dose 1 g)
        ii. Ibuprofen 10 mg/kg PO for patients greater than 6 months of age (maximum dose 800 mg)
    b. Intranasal (IN) options (preferred as initial dosing, particularly in children, to initiate pain

relief prior to, or in the absence of, IV access. IN administration may obviate the need to obtain IV access for pain medication)
        i. Fentanyl 1 mcg/kg IN
        ii. Ketamine: 0.5 mg/kg IN (maximum initial dose 25 mg; maximum cumulative dose 100 mg)
    c. Intramuscular (IM) options
        i. Ketorolac (one-time dose only)
            - Adult (non-pregnant): 30 mg IM
            - Pediatric (2-16 years old): 1 mg/kg IM (maximum dose 30 mg)
        ii. Morphine sulfate: 0.1 mg/kg IM (maximum initial dose 15 mg)
        iii. Fentanyl 1 mcg/kg (maximum initial dose of 100 mcg)
    d. Inhaled: nitrous oxide
4. Establish IV access if there is ongoing pain warranting further treatment and administer one of the following:
    a. Acetaminophen:
        i. Adult: 1 g IV
        ii. Pediatric: 15 mg/kg IV (maximum dose 1 g)
    b. Ketorolac (one-time dose only):
        i. Adult: 15 mg IV in adults who are not pregnant
        ii. Pediatric (2-14 years old): 0.5mg/kg (maximum dose 15 mg) IV
    c. Fentanyl:
        i. Adult: 25-50 mcg IV
        ii. Pediatric: 1 mcg/kg IV (maximum initial dose 100 mcg)
    d. Morphine sulfate:
        i. Adult: 5 mg IV
        ii. Pediatric: 0.1 mg/kg IV (maximum initial dose 5 mg)
    e. Hydromorphone:
        i. Adult: 1-2 mg IV
        ii. Pediatric: 0.015 mg/kg IV (maximum initial dose 2 mg; maximum cumulative dose of 4 mg)
    f. Ketamine:
        i. Adult: 25 mg IV (slow IV push or infusion in 100 cc NS/LR)
        ii. Pediatric: 0.25 mg/kg IV (maximum initial dose 25 mg; maximum cumulative dose 100mg)
5. Consider administration of oral, sublingual, or IV anti-emetics to prevent nausea in high-risk patients [see Nausea/Vomiting guideline]
6. If indicated based on pain assessment, and vital signs allow, may repeat pain medication administration every 15 minutes (to maximum recommended dose) (excluding ketorolac, ibuprofen, and acetaminophen)

7. Transport in position of comfort and reassess as indicate

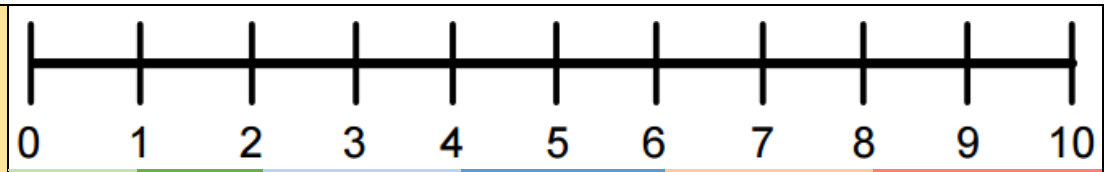
Adult nonverbal pain scale University of Rochester Medical Center

Categories	0	1	2
Face	No particular expression or smile.	Occasional grimace, tearing, frowning, wrinkled forehead.	Frequent grimace, tearing, frowning, wrinkled forehead.
Activity (movement)	Lying quietly, normal position.	Seeking attention through movement or slow, cautious movement.	Restless, excessive activity and/or withdrawal reflexes.
Guarding	Lying quietly, no positioning of hands over areas of body.	Splinting areas of the body, tense.	Rigid, stiff.
Physiology (vital signs)	Stable vital signs	Change in any of the following: * SBP > 20 mm Hg. * HR > 20/minute.	Change in any of the following: * SBP > 30 mm Hg. * HR > 25/minute.
Respiratory	Baseline RR/SpO_2 Compliant with ventilator	RR > 10 above baseline, or 5% ↓SpO_2 mild asynchrony with ventilator	RR > 20 above baseline, or 10% ↓SpO_2 severe asynchrony with ventilator

Abbreviations: HR, heart rate; RR, respiratory rate; SBP, systolic blood pressure; SpO2, pulse oximetry.
Instructions: Each of the 5 categories is scored from 0-2, which results in a total score between 0 and 10. Document total score by adding numbers from each of the 5 categories. Scores of 0-2 indicate no pain, 3-6 moderate pain, and 7-10 severe pain. Document assessment every 4 hours on nursing flow-sheet and complete assessment before and after intervention to maximize patient comfort. Sepsis, hypo-volemia, hypoxia need to be excluded before interventions.

From: Odhner M, Wegman D, Freeland N, Ingersoll G. Evaluation of a newly developed non-verbal pain scale (NVPS) for assessment of pain in sedated critically ill patients.
Available at: http://www.aacn.org /AACN/NTIPoster.nsf/vwdoc/2004NTI Posters. Accessed July 18, 2017.

Universal Pain Assessment Tool

Verbal Descriptor Scale						
	No Pain	Mild Pain	Moderate Pain	Severe Pain	Very Severe Pain	Excruciating Pain
Wong-Baker FACES®						
Descriptive Scale	Alert Smiling	No Humor Serious, Flat	Furrowed Brow Pursed Lips Breath Holding	Wrinkled Nose Raised Upper Lip Rapid Breathing	Slow Blink Open Mouth	Eyes Closed Moaning Crying
Activity Tolerance Scale	No Pain	Can be Ignored	Interferes with Tasks	Interferes with Concentration	Interferes with Basic Needs	Bed Rest Required
Spanish	Nada de Dolor	Un Poquito de Dolor	Un Dolor Leve	Dolor Fuerte	Dolor Desmasiado Fuerte	Un Dolor Insoportable

Source: Hybrid of scales by authors. Wong-Baker FACES® Pain Scale Rating license grants this use. Reproduction of the Wong-Baker FACES® material requires licensing at www.wongbakerfaces.org.

Pediatric-Appropriate Pain Assessment Tools

Faces, Legs, Activity, Cry, Consolability (FLACC) Behavioral Scale

Appropriate age for use (per guideline): less than 4 years

Categories	Scoring		
	0	**1**	**2**
Face (F)	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs (L)	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity (A)	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry (C)	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability (C)	Content, relaxed	Reassured by occasional touching, hugging, or being talked to, distractible	Difficult to console or comfort
Each of the five categories is scored from 0-2, which results in a total score between zero and ten.			

Instructions:

- **Patients who are awake:** Observe for at least 1-2 minutes. Observe legs and body uncovered. Reposition patient or observe activity, assess body for tenseness and tone. Initiate consoling interventions, if needed
- **Patients who are asleep:** Observe for at least 2 minutes or longer. Observe body and legs uncovered. If possible, reposition the patient. Touch the body and assess for tenseness and tone.

Face

- Score 0 point if patient has a relaxed face, eye contact and interest in surroundings
- Score 1 point if patient has a worried look to face, with eyebrows lowered, eyes partially closed, cheeks raised, mouth pursed
- Score 2 points if patient has deep furrows in the forehead, with closed eyes, open mouth and deep lines around nose/lips

Legs

- Score 0 points if patient has usual tone and motion to limbs (legs and arms)
- Score 1 point if patient has increase tone, rigidity, tense, intermittent flexion/extension of limbs

- Score 2 points if patient has hyper tonicity, legs pulled tight, exaggerated flexion/extension of limbs, tremors

Activity

- Score 0 points if patient moves easily and freely, normal activity/restrictions
- Score 1 point if patient shifts positions, hesitant to move, guarding, tense torso, pressure on body part
- Score 2 points if patient is in fixed position, rocking, side-to-side head movement, rubbing body part

Cry

- Score 0 points if patient has no cry/moan awake or asleep
- Score 1 point if patient has occasional moans, cries, whimpers, sighs
- Score 2 points if patient has frequent/continuous moans, cries, grunts

Consolability

- Score 0 points if patient is calm and does not require consoling
- Score 1 point if patient responds to comfort by touch or talk in ½ - 1 minute
- Score 2 points if patient require constant consoling or is unconsoled after an extended time

Whenever feasible, behavioral measurement of pain should be used in conjunction with self-report. When self-report is not possible, interpretation of pain behaviors and decision-making regarding treatment of pain requires careful consideration of the context in which the pain behaviors were observed.

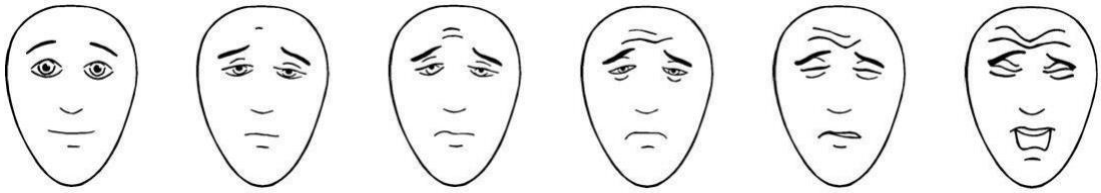
Each category is scored on a 0-2 scale, which results in a total score of 0-10

Assessment of Behavioral Score:

0 = Relaxed and comfortable
1-3 = Mild discomfort
4-6 = Moderate pain
7-10 = Severe discomfort/pain

Source: *The FLACC: A behavioral scale for scoring postoperative pain in young children*, by S Merkel and others, 1997, *Pediatr Nurse* 23(3), p. 293–297.

Faces Pain Scale – Revised (FPS-R)



In the following instructions, say "hurt" or "pain", whichever seems right for a particular child. "These faces show how much something can hurt. This face [point to face on far left] shows no pain. The faces show more and more pain [point to each from left to right] up to this one [point to face on far right] - it shows very much pain. Point to the face that shows how much you hurt [right now]."
Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so "0" = "no pain" and "10" = "very much pain". Do not use words like "happy" or "sad." This scale is intended to measure how children feel inside, not how their face looks.

Patient Safety Considerations

1. All patients should be questioned regarding allergies to pain medications prior to administration
2. Avoid opioids with patients with GCS less than 15, hypotension, hypoxia (oxygen saturation less than 90%) after supplemental oxygen therapy, or signs of hypoventilation
3. Opioids are contraindicated for patients who have taken monoamine oxidase inhibitors (MAOIs – e.g. Nardil®, Parnate®, Azilect®, Marplan®, Eldepryl®) during the previous 14 days
4. Avoid non-steroidal anti-inflammatory medications such as ketorolac and ibuprofen in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, or known peptic ulcer disease
5. Ketorolac and ibuprofen should not be used in patients with hypotension (due to renal toxicity)
6. Use of splinting techniques and application of ice should be done to reduce the total amount of medication used to keep the patient comfortable

Notes/Educational Pearls

Key Considerations

1. Pain severity (using scales outlined above) should be recorded before and regularly (i.e., every 15 minutes) after analgesic medication administration and upon arrival at destination
2. For the initial management of moderate to severe pain, IV acetaminophen is preferred over IV opioids, when available, to minimize adverse side effects
3. Patients with acute abdominal pain may safely receive analgesic medications as needed for comfort – Use of analgesics for acute abdominal pain does not mask clinical findings or delay diagnosis

4. Combining ketamine with opiates does not provide added analgesic benefit and adds complexity and increased risk for adverse effects and errors and errors in administration
5. Pediatric Considerations: IN medications (fentanyl/ketamine) are preferred over IV/IM for pediatrics to potentially avoid the need for IV access for pain medication administration

Pertinent Assessment Findings

1. Mental status (GCS/AVPU)
2. Pain level (based on appropriate age-based scales)
3. Respiratory system (respiratory rate, pulse oximetry, ETCO2)

Quality Improvement

Associated NEMSIS Protocol(s) (eProtocol.01)

- 9914071 – General-Pain Control

Key Documentation Elements

- Documentation of patient vital signs with pulse oximetry
- Acquisition of patient's allergies prior to administration of medication
- Documentation of initial patient pain scale assessment
- Documentation of medication administration with correct dose
- Documentation of patient reassessment with repeat vital signs and patient pain scale assessment

Performance Measures

- The clinical efficacy of prehospital analgesia in terms of adequacy of dosing parameters
- **NEMSQA® Measures** *(for additional information, see www.nemsqa.org/completed-quality-measures/*
    - *PEDS-03: Documentation of estimated weight in kilograms.* Frequency that weight or length-based estimate are documented in kilograms
    - *Trauma-01: Pain assessment of injured patients.* Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient is experiencing pain
    - *Trauma-03: Effectiveness of pain management in injured patients.* Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient's pain is being reduced by EMS during transport

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Revision Date

May 31, 2021