

MEDICAL ADVISORY COUNCIL

Position Statement

MAC PS 2013-002

PREHOSPITAL PAIN MANAGEMENT

Appropriate treatment of acute pain in the prehospital arena offers an opportunity to positively impact many patients. Evidence has shown that prehospital pharmacologic management does not have a negative impact on the ability to appropriately assess and manage the patient on hospital arrival. Pain management medications and techniques need to be safe, effective, cause minimal physiologic complications and not negatively impact ability to assess the patient on arrival to the emergency department.

It is the position of the Medical Advisory Committee that:

- 1) Acute pain management is a priority for emergency medical services.
- 2) Appropriate treatment of acute pain should be guided by clinically appropriate protocols in alignment with evidence based guidelines or best practices.
 - a) Prehospital pain management protocols should be in place, and include the following elements:
 - (1) Assessment of both the presence and severity of pain in patients of all age groups
 - (2) Indications / benefits and contraindications / risks for prehospital pain management options
 - (3) Non-pharmacologic options for pain management
 - (4) Pharmacologic options for pain management using different routes. Consideration should be given to including oral, nasal / mucosal, intravenous, transdermal options for inclusion in protocols.
 - (a) Pediatric-specific dosing
 - (5) Patient monitoring before and after analgesic administration
 - b) Patient care documentation key elements should be specified
- 3) Actual and perceived barriers to prehospital pharmacologic management of pain should be addressed at the appropriate level (provider, agency, physician, hospital). Common barriers include:
 - a) Concern about serious side effects
 - b) Drug seeking behavior
 - c) Difficulty in assessing degree of pain
 - d) Unfamiliarity with medication dosing
 - e) Emergency Department staff concerns regarding ability to properly assess patient
 - f) Need for online medical control to provide pain management (lack of standing orders)
 - g) Insufficient perceived need for EMS intervention, short transport time
 - h) Pediatric specific barriers:
 - i) Higher anxiety among EMS providers
 - ii) Variable beliefs around importance of treating pain
 - iii) Difficulty in obtaining IV access
 - iv) Inadequate education and training: dosing recommendations and pain score assessment

v) Lack of pediatric specific protocol

Approved by the Medical Advisory Council on July 16, 2013

Dr. Sabina Braithwaite
Chair, Medical Advisory Council

PREHOSPITAL PAIN MANAGEMENT

RESOURCE DOCUMENT

Pain Assessment

It is difficult for the prehospital care provider to infer the amount of pain and suffering based upon the degree of tissue damage. Other factors affecting the patient's interpretation of pain include psychological, emotional, cultural and behavioral qualities. The patients' self-report of pain provides a comprehensive pain assessment which includes clinical assessment, pain history and treatment. Those groups at high risk of inadequate pain management include pediatric, the elderly and the cognitively impaired (2). The patient is your best source for determining the presence and intensity of pain. The most common pain scale used in adults is the Numeric Rating Scale (NRS) (3). Patients verbally rate their pain from 0 (no pain) to 10 (unbearable pain). This pain scale NRS is easily used in the prehospital setting down to the age of 8 to 10 years, below that the prehospital provider will have to depend on close observation of the child's behavior (crying, grimacing etc.). If the child is cooperative the prehospital provider may use the pain assessment scales appropriate for children: the Faces scale (Baker-Wong); Faces, Legs, Activity, Cry and Consolability (FLACC); and Visual Analog Scale (4). Be careful, it is well known that medical providers underestimate the severity of pediatric pain.

Indications and Contraindications

When promulgating pain management protocols emergency medical services should review their list of indications with their receiving emergency departments to develop a consensus of opinion and acceptance by receiving physicians. Initially categorizing the type of pain may help in choosing appropriate intervention: acute, an acute exacerbation of a recurring painful condition; chronic/persistent, and cancer pain. Routine indications might include isolated extremity injuries, burns and back pain.

Non-pharmacologic Treatment of Pain

Prehospital care providers can bring significant pain relief and comfort to patients without pharmacologic agents. This includes immobilization of fractures and dislocations, elevation of extremities, application of ice packs, padding of splints and spinal immobilization devices and the presence of parents, toys and other distractions for infants and children.

Pharmacological Treatment of Pain

The following is a review of two of the most common opioid analgesic agents used in the prehospital environment; Morphine and Fentanyl. The purpose of opioids is to provide relief of the patient's pain and suffering from their acute illness or injury. Some of the traits inherent to opioids include: cough suppression by depressing cough centers in the medulla; pupillary constriction which can occur after relatively small doses; nausea and vomiting by producing complex effects on vomiting centers in the medulla; minimal cardiovascular effects at normal doses; and at equianalgesic doses all opioids produce equivalent amounts of respiratory depression (5).

Opioids impair the patient's ventilatory response to increasing levels of carbon dioxide in a dose related manner. Morphine also blunts the patient's ventilatory response to hypoxia. With the administration of narcotics the rate and rhythm of breathing is altered. As the dose opioid is increased the respiratory rate will slow but this may be offset by increased tidal volume (5). At normal analgesic dose required in the prehospital field opioids would rarely cause significant respiratory depression unless there is a preexisting abnormality such as; pulmonary or central nervous system disease or prior drug administration, alcohol, benzodiazepines or previous self-administration of pain medications. Large doses of opioids can lead to inadequate ventilation but often simply stimulating the patient and encouraging them to breathe with the administration of oxygen is often sufficient to avoid hypoxia.

Morphine

Morphine is an opium alkaloid used to relieve pain, to sedate, and reduce anxiety. It is associated with peripheral vasodilation which decreases myocardial consumption, reduces cardiac preload and ultimately decreases cardiac work. After intravenous administration peak analgesic effect may not occur for 15 to 30 minutes and the peak for respiratory depression is 30 to 60 minutes (6). The half-life of morphine is 1.5 to 2 hours. Morphine administration may induce histamine release both locally and systemically causing itching, hives and hypotension. Both renal and hepatic failure can increase the effect of morphine. It does cross the placental barrier.

Dosage:

Adults and Pediatrics:

0.1 mg/kg IV/IO Reassess every 5 minutes

If still in significant pain, redose at half the original dose

Fentanyl

Fentanyl is a synthetic opiate with a greater potency than morphine, approximately one hundred times more potent. It is highly lipophilic which accounts for its rapid onset and short duration. After intravenous administration its peak effects can be seen at 3 to 5 minutes. Due to rapid redistribution to peripheral compartments intravenous Fentanyl has a relatively short half-life of 30 to 60 minutes. Fentanyl does not cause histamine release thereby reducing the frequency of hypotension. In general the cardiovascular system remains stable. Also Fentanyl has no euphoric effect and is less likely to cause nausea like morphine. It does cross the placental barrier.

The drug is absorbed transdermally, intranasally and by the oral mucosa as well. In pediatric patients intranasal Fentanyl is a noninvasive and relatively easy way to administer pain medication. The nose has a rich vascular supply with immediate passage of drugs into the blood stream via the nasal mucosa. Fentanyl can be administered via the MAD atomizer as long as the drug volume is less than 2 to 3 ml.

Braude and Richards made an appeal for the use of Fentanyl in the prehospital arena through a letter published in the Prehospital Emergency Care Journal in 2004. They cited four reasons why they chose Fentanyl over Morphine for prehospital analgesic. Fentanyl is a more rapid acting narcotic than morphine reaching a peak effect in 2 to 3 minutes versus 15 minutes for morphine. Dose stacking, where a repeat dose is given before there is a peak effect of a prior dose, is more likely to be a problem with morphine than Fentanyl leading to possible overdose. Fentanyl has a shorter duration of action which may require more frequent dosing but reduces the incidence of sedation. This property permits the abdominal pain of medical patients to be treated in the field yet allows the narcotic to dissipate by arrival to the emergency department and for evaluation by the attending physician. In addition Fentanyl does not produce histamine release like morphine leading to hypotension and less likely to induce nausea and vomiting.

Dosage:

Adult and Pediatrics:

1 mcg/kg IV/IO/IN Reassess patient every 5 minutes.

If still in significant pain, redoes at half the original dose.

Ketorolac and NSAIDS

Ketorolac is a non-steroidal anti-inflammatory drug with analgesic opioid like activity. It is indicated for the short term treatment of moderate to severe pain. After intravenous administration it reaches its peak plasma concentration in 1 – 5 minutes depending on the dose of 15 – 30 mg and its duration of analgesia is 5 – 6 hours. The drug is associated with several contraindications: patients with peptic ulcer disease, recent gastrointestinal bleed, asthma, pregnancy, Aspirin sensitivity and patients who have under gone Bariatric surgical procedures. With the addition of over the counter medications to the scope of practice oral NSAIDS can be considered. The medications may be given with a small amount of water without creating problems even if surgery becomes necessary.

Dosage:

Ketorolac: Adults < 65 y/o 30 mg IV/IO, Adults > 65 y/o 15 mg IV/IO

Pediatrics: 0.5 mg/kg IV/IO

Ibuprofen: Adults: 400 – 600 mg

Pediatrics: 5 – 10 mg/kg

Ketamine

Ketamine is a dissociative anesthetic producing sedation and amnesia which can be administered intramuscular or intravenous. It has a rapid onset by either route. In small analgesic doses does not impair airway maintenance or spontaneous ventilation and increases blood pressure and heart rate. Rare side effects

include increased oral secretions, laryngospasms, hypertension, emergence delirium and hallucinations. Suggested indications include extremity fractures, pain relief during extrication and control of patients exhibiting behavioral disorders and excited delirium.

Dosage:

Adult and Pediatrics:

Intramuscular 4 – 6 mg/kg

Intravenous 1 – 2 mg/kg

Summary

The Medical Advisory Council encourages all emergency medical services to aggressively provide treatment of pain for their patients. This paper briefly reviewed assessment of pain, the non-pharmacologic and pharmacologic treatment of pain in the prehospital environment. Based on evidence presented opiates would be appropriate in the field. Medical directors and their emergency medical services can overcome these barriers through offline protocols, training, non- intravenous treatment, medical oversight and coordinating care with receiving facility.

References:

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