PAIN ASSESSMENT AND MANAGEMENT

ALS TRACK -

One of the most frequent conditions encountered by EMS professionals in the field is pain. Working collaboratively with the National Association of EMS Physicians (NAEMSP) and the American College of Emergency Physicians (ACEP), NASEMSO led a project to develop evidence-based guidelines (EBGs) for the pharmacologic management of acute pain in the prehospital setting. The principal investigator was George Lindbeck, MD, from NASEMSO; co-investigators were Sabina Braithwaite, MD, representing ACEP, and Manish Shah, MD, of NAEMSP. Together they led a multi-disciplinary technical expert panel comprised of an EMS clinician and EMS educator, as well as others with expertise in emergency medicine, pediatrics, pain management, pharmacology, trauma care, guideline development methodology, patient advocacy, EMS data. Upon conclusion of the project, several members of the Technical Expert Panel participated in a webinar entitled Evidence Based Guidelines for Prehospital Pain Management. The webinar, hosted by the National Association of EMS Educators, is presented below.

Evidence Based Guidelines for Prehospital Pain Management Video

https://youtu.be/LE2Ddx_lH_8

Model EMS Protocol for Prehospital Pain Management

The following article is take from STOPIOID which is a free open access medical education (FOAMed) resource for health care providers. Postings are evidence based, with a focus on multi-modal approaches to pain management..

PAIN MANAGEMENT IN THE GERIATRIC PATIENT

Effective treatment of acute pain in elderly patients is a constant challenge in the Emergency Department (ED). Older adults with acute pain are up to 20% less likely to receive treatment than younger patients and still often leave the ED with pain (1). Aging is associated with physiological, cognitive and functional changes which all have an impact on how pain can be managed. Pain control in the elderly usually involves a balance between pain relief and the risk of unwanted side effects (1). Any patient who has pain that impairs functional status or quality of life is a candidate for analgesic drug therapy (2).
The old axiom “start low and go slow” is the best way to mitigate adverse effects associated with systemic analgesia. Careful titration with frequent reassessment allows for optimal and safe acute pain care in older adults (3). Additionally, understanding general fundamentals of geriatric medicine as well as the individual patient’s co-morbidities are paramount to selecting a safe and effective analgesic regimen.

Pharmacokinetic Considerations in the Elderly:

- Elders have less muscle mass and increased adipose. Water soluble drugs exert greater toxic effects per unit dose.
- Lipophilic drugs are more widely distributed and have longer half-lives in the elderly.
- Polypharmacy - Most elderly patients are already on a number of medications, which increase the risk for drug-drug interaction.
- Chronic medical conditions may affect drug metabolism and clearance.

- Elderly patients have decreased functional reserve and thus have a lower threshold for manifesting side effects such as dizziness, hypotension and hypoxia.

Pain Perception in the Elderly:

- Pain perception thresholds are normally maintained in older patients, including those with cognitive impairment (4). Although pain thresholds are normal, pain stimuli are processed differently at the cortical level. Central neurodegenerative changes alter the way in which pain is expressed by the patient, especially the affective component of pain (5).
- Elderly patients with severe cognitive impairment or altered mental status may not be able to quantify or even verbalize their pain. It is important to assess for behavioural cues such as grimacing or change in baseline functioning.
- Acute pain is often associated with autonomic nervous system abnormalities including tachycardia, diaphoresis or elevation in BP.

As with all patients, the approach to analgesia in the elderly patients should be multimodal, pain targeted and patient specific. The following is a summary of most common analgesics used for acute pain management in the ED with specific recommendations for the elderly.

Acetaminophen (APAP):
APAP is the backbone of any multimodal analgesic regimen. It is recommended by the American Geriatric Society as a first-line agent for mild ongoing and persistent pain, before moving to a stronger alternative (6). APAP is generally well tolerated with minimal side effects. Consider withholding in patients with heavy alcoholism or severe liver impairment. Note that many commercially available medications are coupled with acetaminophen. Ensure that the patient is not already taking some form of APAP to avoid inadvertent overdose.

Non Steroidal Anti-inflammatory Drugs (NSAID):
NSAIDs reduce inflammation and are effective analgesics but are not always well tolerated in the elderly. NSAIDs increase the risk of gastric bleeding which is a prevalent medical issue in elderly adults. *Toradol should not be used in this population secondary to its high potential for adverse GI effects and renal toxicity* (1).

NSAIDs can cause fluid retention and hypernatremia, which can exacerbate CHF. In addition, they can contribute to kidney injury in patients who are anemic, hypovolemic or on ACE inhibitors or diuretics. The vasoconstrictive effects of NSAIDs in patients with coronary or cerebrovascular disease is unlikely to have a significant short term effect but risks should be considered in chronic use. Patients on anti-platelet agents, Warfarin or other blood thinners are often advised not to take NSAIDs due to synergistic bleeding risks.

Opioids:
Opioids can be used for moderate to severe pain in the elderly. Dosing should be reduced by 25-50% and titrated up as necessary. Elderly patients are physiologically more sensitive to the sedating effects opioids. Opioids use has been associated with an increased risk for falls and fall-related injuries in older adults (7).

Morphine should be used with extreme caution. Morphine breaks down into multiple active metabolites that can accumulate in elderly patients and result in respiratory depression and delirium. Hydromorphone and Fentanyl are better suited for the elderly as they do not have any active metabolites.
Codeine is a weak analgesic that is metabolized to morphine. It is associated with more nausea and constipation than other opioids (12). Codeine should be used with caution in geriatric patients because it has been found to have greater central nervous system side effects and is associated with increased risk of falls and hip fractures (8,9).

When compared with hydrocodone, codeine carries an increased cardiovascular event risk after 180 days, and oxycodone and codeine had higher all-cause mortality at 30 days (10).
Methadone should be avoided in elderly patients. Cardiovascular effects such as QT prolongation and Torsades de pointes are more commonly seen with methadone than other opioids (11).

Take Away Points:

- Pain is often under treated in the elderly patients.
- Due to physiological changes, elderly patients may be more prone to side-effects associated with analgesia.
- Opioid dosing should be decreased by 25-50% in elderly individuals.
- Hydromorphone and fentanyl are preferred opiates in geriatrics as they do not have active metabolites.
- "Start low and go slow." Give smaller doses at greater frequency until effective analgesia is achieved.
- When possible, consider regional analgesic techniques such as nerve blocks instead of systemic analgesia.

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BLS TRACK -

JEMS

A Guide to Prehospital Pain Management

Find out why pain control is more than just medication administration.

Paul Paris, MD, Paul E. Phrampus, MD

EMS providers routinely treat patients with pain; it's the most common reason patients seek medical attention in the ED.[1] Providers who understand the physiologic mechanism that causes pain, the physiologic response to pain and the methods with which to control it are best equipped to care for these patients. Pain control is as much an art as a science. Appropriately titrated doses and careful patient monitoring minimize the risk of harmful side effects from pain medications. However, studies show that patients consistently receive inadequate doses or no pain control during their interaction with the medical community.[2] This is especially true in the pediatric trauma population as well as non-Caucasians, but many factors contribute to the undertreatment of pain.[3,4] Although recent concerns about the national opioid epidemic involving prescribed, non-prescribed and recreational opiates are creating a revision of practice guidelines for opiate medications, it's still widely believed that prehospital providers have a low risk of creating opioid abuse when using medications properly. This is especially true in the setting of obvious injury. Prehospital providers may harbor concerns that aggressive pain management will delay or prohibit an accurate diagnosis by a receiving physician. To alleviate this concern, consider different causes of pain: A patient with an obvious extremity fracture shouldn't be denied pain medicine for fear of clouding another diagnosis. The basic techniques taught in EMT and paramedic classes, such as splinting a painful fracture, still often provide the most pain relief. Providers should base pain management decisions on the underlying cause of the pain, the amount of pain and available resources. The goal of initial pain management isn't to extinguish pain, but to reduce the pain perceived by the patient to a tolerable level without causing serious side effects.

The Physiology of Pain

The physiology of pain is complex. Sensory nerve cells, or neurons, transmit impulses and function as receptors. They exist in almost every location in the body and receive information, such as pressure, pain and temperature. The neurons convert this information into electrical impulses that are relayed to the spinal cord. Ultimately, the sensory cortex of the brain perceives the pain. Pain fibers are divided into two subcategories: fast and slow.[6] The brain senses fast pain in about one-tenth of a second. This type of pain occurs when someone strikes their fingernail with a hammer. The person would describe the pain as intense or sharp. Slow pain takes about one second to register in the brain. Patients associate slow pain with aching, throbbing and chronic disease. Pain-sensor distribution also affects pain perception. For example, the fingertips have a dense distribution of pain fibers and, therefore, are highly sensitive to pain. In contrast, the abdominal organs don't have an abundance of pain receptors and are more sensitive to stretch and pressure sensations, resulting in an achy, diffuse, nonspecific presentation. However, when an inflamed abdominal organ touches the peritoneum, which is rich in pain fibers, the patient complains of excruciating pain with a more specific location. This physiology is best demonstrated in appendicitis, which classically starts with a diffuse, nonspecific of abdominal pain and then progresses to the right lower quadrant. Also, the location of pain sensors plays a role in the clinical presentation of pain. Common nerve fibers running adjacent to each other may overlap the signal received in the brain and set up referred-pain patterns. When a patient perceives pain in an area different from its point of origin, we call it referred pain. A common example: the radiation of ischemic heart pain to the left arm.

The Physiologic Response to Pain

The physiologic response to pain is also complex. The brain releases chemical mediators, such as endorphins, during stress to decrease pain. Endorphins, opiate-like mediators, bind to neurons' opiate receptors and decrease the transmission of the pain impulse. Numerous chemicals play smaller roles in pain modulation. The clinical responses a patient displays in reaction to pain vary widely. Classically, the sympathetic nervous system releases epinephrine. This will often produce an increased pulse rate, increased blood pressure, increased respiratory rate and diaphoresis. There are many factors that may alter a patient's response to pain. Beta-blockers, commonly taken for hypertension, may blunt tachycardia in a patient. Also, profound pain may acutely lead to a vagal response, leading to bradycardia and possibly hypotension. Additionally, every patient has a certain pain tolerance or pain level they can endure before the physiologic response is activated. Many things affect a person's pain tolerance, including:

- Training;
- Culture;
- Expectations;
- Overall health;
- Mental health;
- Drugs (prescribed chronic pain medications and illicit drugs, such as chronic heroin or other opioid use);
- Alcohol; and
- Sleep deprivation.

Assessment

Providers should assess a patient complaining of pain by finding their chief complaint. The pain source may be obvious, such as an acute injury. But, if the source of their pain is an illness, it may not be as easy to assess. Obtain the patient's vital signs. Ask them the standard questions regarding pain evaluation. Table 1 contains a helpful mnemonic to use when evaluating pain.

Table 1: OPQRST—pain assessment mnemonic

O	Onset
P	Provoking factor
Q	Quality (description)
R	Radiation
S	Severity
T	Time sequence

When evaluating the pain's severity, have the patient grade it on a scale from zero to 10—zero being no pain and 10 being the worst pain of their life. This is called the verbal analog scale. It allows the patient to continuously grade the pain as you intervene. Providers should document each response on the patient care report. When interpreting vital signs, remember the golden rule of pain management: If the patient says they have pain, then the patient has pain–regardless of clinical presentation.

Pain Control

When considering pain control, the first thing many healthcare providers think of is medication, but that's only part of the picture. The basic techniques taught in EMT and paramedic classes, such as splinting a painful fracture, still often provide the most pain relief. To illustrate, we'll use a pain model of musculoskeletal trauma involving an extremity. Table 2, below, contains a helpful pain-control mnemonic.

Table 2: SPLINT—extremity injury pain-control mnemonic

S	Splint/immobilize
P	Pharmacology
L	Lift (elevate)
I	Ice
N	Neurovascular check
T	Talk (communications)

For an extremity injury, pain management begins with immobilizing or splinting the extremity. Immobilizing the affected limb will significantly reduce the patient's pain. Often, the patient will require only the application of a splint for pain management. Proper immobilization not only controls pain, it also lessens the chance of neurovascular injury occurring during transport. Lifting or elevating the immobilized extremity increases the venous flow from the extremity and decreases arterial blood flow. Elevation also limits tissue swelling, assisting in pain control. Ideally the extremity should be raised above the heart level. However, if this isn't possible due to logistical reasons, simply elevate the immobilized extremity onto a pillow or blanket roll for therapeutic relief. Providers also often overlook the application of ice to painful areas. Cooling an injured area decreases the pain information transmitted from the nerves, thereby lowering the patient's pain perception. Ice also helps limit the amount of swelling in the injured area. Swelling increases the tissue pressure in the area and, correspondingly, the amount of pain.

Patient Communication

Communication–an often under-utilized component of pain management–may be one of the most important tools in a provider's arsenal. A first responder who treats a patient confidently, with a professional demeanor and compassion, will help break the pain anxiety cycle. How a patient perceives the people caring for them and the way the personnel work dramatically influences the patient's suffering. A professional demeanor inspires confidence and trust. In addition, acknowledging the patient's pain is crucial. If the patient must be moved before final immobilization takes place, the patient should be informed about the plan. The provider must explain every step of the process to the patient to alleviate–or at least control–the anxiety that accompanies acute illness and injury. Distraction is another powerful communication skill. Providers should talk to their patients and attempt to distract them so they won't continuously concentrate on their pain. This is particularly important during protracted extrications.

Summary

- Even the experienced field provider may find pain control a challenge, and research on prehospital methods to control pain remains scarce.
- Simple interventions, such as splinting, applying ice and talking to patients, can assist in the control of the patient's pain and anxiety. These methods are available to all provider levels and should be implemented routinely.
- Advanced providers have had opioid analgesia to control pain for many years and have begun to include anti-inflammatory agents to their pain control regimens. An increase in research and education of providers and medical directors can expand the arsenal of methods available to control pain in the field.
- Concerns for chronic opioid abuse may be uncovered in the history or physical exam and should prompt the EMS provider to be extra concerned for signs of serious side effects of opiate medications should they be administered.

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Pediatric Pain Assessment Video

https://youtu.be/uaWFtwj2ab4

Pain Control

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Attempt to manage all painful conditions:
    a. Splint extremity injuries
    b. Place the patient in a position of comfort
    c. Hot or Cold packs as needed

Advanced Care Guidelines

2) Consider administration of pain medications for patients that have significant pain, do not have a decreased level of consciousness, are hemodynamically stable, have oxygen saturations above 94% and pain is not a result of active labor.

Toradol

-Adult: 30mg IM or 15 mg IV

-Pediatric: 0.5mg/kg not to exceed the adult dose of 30mg IM or 15mg IV

OR

Fentanyl

-Adult: 1mcq/kg IM, IN, IV or IO. Max initial dose 100 mcq. May repeat as needed as long as patient remains stable and GCS intact.

-Pediatric: 1mcq/kg not to exceed the adult dose.

*If Fentanyl is not available, Morphine may be used instead, 0.1mg/kg with a max cumulative dose of 10mg for adults. Pediatric: 0.05mg/kg not to exceed the adult dose, should follow the length-based tape not to exceed the adult dose. *

3) For severe pain consider anxiolytic medication
    a. **Versed**
    -Adult 0.5-2.5 mg IV /IM/IN repeated every 5 minutes as needed to a max of 5mg
    -Pediatric: Follow length-based tape not to exceed the adult dose.
    OR
    b. **Valium**
    -Adult 2-5 mg IV /IM/IN repeated every 5 minutes as needed to a max of 10 mg
    -Pediatric: 0.1mg/kg Follow length-based tape not to exceed the adult dose.
    OR
    c. **Ketamine**
    -Adult 0.25mg/kg IM/IV/IO maximum initial dose is 25mg. May repeat if needed with a maximum cumulative dose of 100mg. May follow up with 1mg Versed if pt is presenting with post medication hallucinations.
    -Pediatric:0.1mg/kg Follow length-based tape not to exceed the adult dose.