



Innovations in Process Management/Optimizing Patient Management

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A 49 year old male presents to the emergency department with excruciating back pain after lifting a heavy ramp at work yesterday. Patient rates his pain a ten out of ten. Patient has had two prior episodes of back pain, the most recent was one year ago. The pain is in his buttock and right thigh. Patient has a history of non-insulin dependent diabetes. Review of systems, social and family history is non-contributory. The patient has no allergies. The patient's past medical history demonstrated an otherwise healthy individual.

The physical examination revealed a male patient appears his appropriate age lying uncomfortable in pain requesting pain medication. His vital signs were blood pressure of 162/99, pulse of 73, respiratory rate of 19, afebrile. His heart, lungs and abdominal exam was normal. He had right sided back pain with radiation down his leg. Reflexes were plus 2 in both legs and strength was 5 of 5 in each leg. Straight leg raises was decreased on the right side and sensation was normal.

Key Clinical Questions

How to assess a patient's level of pain?

What adjuncts can be used for which type of pain?

What patient education can be useful when discharging this patient?

Key Learning Points

- Emergency physicians commonly perform a limited assessment of the patient's level of pain. Determining the patient's level of pain using an appropriate assessment tool improves the provision of care.
- Pain treatment typically includes medications but less frequently includes adjuncts to therapy. These adjuncts are useful additions to usual medication therapy.
- Pain education at discharge from the emergency department is an essential component to good medical care for treating patients in pain.

Pain Assessment

It is well known that emergency physicians (EPs) do not accurately perceive a patient's level of pain. Therefore, proper assessment of pain is necessary to provide appropriately aggressive pain treatment in the emergency department. Appropriately, aggressive pain treatment is not only good medical care with improved customer service but also improves patient compliance. There is some data to suggest that aggressive treatment of acute pain reduces the progress to chronic pain. Whether one agrees with the edicts of the Joint Commission of Healthcare Organizations (JCAHO) or not, pain assessment is essential to ensure that physicians are properly addressing the patients' need for pain relief

There are various means to assess pain in patients including behavioral, physiologic and subjective approaches. Behavioral approaches include observation, vocalization, facial expression and body movement; whereas physiologic approaches include heart rate, blood pressure, sweating, stress hormones levels. Subjective approaches include self-reported numerical, visual and categorical methods. More extensive pain assessments such as the McGill Pain Questionnaire and Short Form 20 Health Survey better differentiate pain syndromes and effect on lifestyle but have limited value in the emergency departments (ED).

Numerical scales use verbalization of pain from 0-10 or 0-100 with end points as no pain or worst pain. Visual analog scales measure pain with a 10 cm line with similar end points and categorical scales use pain intensity on a 4 point scale from "no pain" to "severe pain". Other scales are available for use in special populations such as those used for illiterate and cognitively impaired persons that take into account their disabilities.

Although the commonly used methods in the EDs are numerical scales, the studies suggest that visual scales are a better method of pain assess. Visual pain scales have the advantage of ratio scale property, ease and brevity of administration, minimal intrusiveness, and conceptual simplicity [1-2]. Visual scales usually use a horizontal 10 cm line without gradations is recommended. Thirteen to sixteen millimeters difference is considered clinically significant on this scale.

On the other hand, scales for children need to be age and developmentally appropriate [3-4]. Scales for infants are primarily behavioral observation or physiologic. One example of a tool for assessing pain in the infant is the Neonatal Facial Coding System that evaluates facial muscle groups for preterm, full term, neonates or infants. Physiologic assessment includes heart rate, blood pressure, respiratory rate and level of diaphoresis. Pre-school children tend to do better with faces, the Ocher test, color poker chip or behavioral scales.

The facial expression test, Oucher test, is for 3-12 years old with three different ethnic version. In the faces test, the child chooses the face that represents their level of pain. Behavioral observations scales such as CHEOPS and the Procedure Behavioral Rating Scale are useful tests in this age group but are too extensive for use in the ED. Older children perform well on similar tests as those tests for adults including visual, numerical, and categorical.

The choice of pain assessment tools used in the ED is based on ease of use, familiarity and cost. Numerical rating scales for adults, although limited, and some type of facial pain assessment for pediatric patients are recommended to determine need for and effectiveness of treatment.

Adjunct Therapy

The World Health Organization disseminated a pain treatment ladder going from non-opioid to opioid treatment with or without adjuncts depending on pain severity [5]. The choice of adjuncts depends on the type and severity of pain and the age of the patient. Adult's adjuncts are usually medication related and pediatric adults are usually behaviorally related.

The most common pharmaceutical adjunct used in emergency medicine is topically anesthesia. Topical anesthesia is frequently used prior to procedures such as suturing of a wound. There are many different topical anesthesia preparations including EMLA cream, lidocaine, and tetracaine with or without epinephrine and in combination. Unfortunately, it is not used frequently for routine procedures performed in the ED. Singer and others found emergency physician and nursing do a poor job of rating patients procedural pain [6]. Patients, in this study rated the most painful procedures as a placement of a nasogastric tube, incision and draining of an abscess, fracture reduction and urethral catheterization.

Other pharmaceutical adjuncts for pain treatment include anxiolytics, anticonvulsants, antidepressants and skeletal muscle relaxers. Benzodiazepine are used in anxiety related, muscle injury and spasms but it is limited due to its side effects. Anticonvulsants and antidepressants have benefit in chronic pain. Amitriptyline and other tricyclic anti-depressants are effective in neuropathic pain but serotonin re-uptake inhibitors (SSRIs) have not been well studied for pain use. Caffeine and hydroxyzine has limited potentiation effects in combination with other pain compounds. Muscle relaxants have some effectiveness but suffer from the same limitation as benzodiazepine. Narcoleptic agents have not been shown to have a pain benefit.

Targeted pharmaceutical agents for some headaches, acute gouty arthritis and fractures are also effective. 5-HT₁ receptor antagonists and ergotamines are limited to migraine and cluster headaches. Although limited by gastrointestinal side effects, colchicine is quite effective in the treatment of acute gout. Calcitonin has usefulness in acute vertebral fractures in patients associated with Osteoporosis, Paget's disease and bone malignancies. Corticosteroids have been found to assist in bone, visceral and neuropathic pain. For example, corticosteroidal injections are of uncertain benefit in musculoskeletal problems such as rotator cuff disease and injuries, adhesive capsulitis and mixed disease.

The standard non-pharmaceutical adjuncts used in the ED is frequently limited to ice, immobilization and elevation for musculoskeletal injuries. Although the studies are limited to the effectiveness of these adjuncts, ice is considered an effective pain reduction agent. The use of other adjuncts not considered standard therapy in the emergency department is not as frequently as the used standard therapy but should be seriously considered. Nonpharmacologic adjuncts may include psychological, acupuncture, hypnosis and relaxation training. Ice has been found to be effective prior to the start of an intravenous catheter or acute musculoskeletal pain [9].

Psychological adjuncts utilize a common sense approach that is to establish a trusting physician patient relationship, recognize the patients concerns and fears, explain the steps of the procedure, provide accurate information about the procedure and provide realistic expectations of the procedure. In the pediatric population, studies have demonstrated that parents not only wish to stay with their child during a procedure but also reduce both their and their child's distress [10].

Other approaches include the use of acupuncture, hypnosis, relaxation and distractions. The use of acupuncture in acute care settings is limited at best. Iserson has used hypnosis in emergency setting for pediatric fracture reduction [10]. Relaxation training has merit in the chronic pain setting but minimal value in the acute care setting. Inexpensive disposable TENS devices for use in the ED is limited by the time to reduce pain and administration of the device. The use of music and television distractions has limited effects in selected environments.

Infants benefit from comfort measures, children 2-6 years old from distraction, children 5-10 years old from suggestions and older children from progressive muscle relaxation and hypnosis.[11] Comfort measures include use of pacifier, swaddling, massage, touch and sucrose solutions. Distractions include kaleidoscope, stories, bubbles, counting, pop-up toys and video games. Suggestions include magic glove, pain switching, breathing techniques, guided imagery and emotive imagery.

It is difficult to determine which of these adjuncts are effective and applicable in the ED for each type of pain. The best means to focus this assessment is by applying the evaluations performed by the Cochrane Group [12]. The Cochrane Group has performed an analysis of the effective techniques for the treatment of low back pain. They evaluated the use of activity, exercise, bed rest, back school, muscle relaxers and lumbar support. Activity was found to have small beneficial effect; exercise and bed rest had no indication for acute pain. Back school is useful for chronic or recurrent back pain, muscle relaxers are effective but have significant adverse effects and lumbar support is of uncertain value.

Patient Compliance

The optimal pain outcome is dependent on a compliant, cooperative patient who can be a partner in the pain management plan. Compliance factors include psychological, environmental and social issues, characteristics of a therapeutic regimen and properties of the physician-patient relationships. There is little data on the means to improve compliance for pain treatment in ED patients.

Although there is limited study about non-compliance of ED patients, compliance, in general, is related to barriers of compliance and forms of non-compliance. Barriers to compliance include unresolved concerns, miscommunication and regime complexity. Forms of non-compliance include original prescription not filled, refills not obtained and incorrect dosing. Study by Thomas and others found that 12% of their ED patients did not fill their prescription and 33% did not follow up [12].

Open communication with the patient and the patient's care providers is the essential component in improving patient compliance. Explanation of the treatment plan and provision of time for questions are essential but are often delegated to the nursing staff. Alternative means to fund or provide medications and follow up to patients without appropriate insurance of funding resources will also improve compliance. Studies have shown that making an appointment for a patient in the ED improves patient compliance with follow up.

Physician Compliance

Physician compliance with accepted pain treatment has increased by the use of a pain education programs. Jones described a four-hour course that increased the treatment of pain that included causes of pain, pathophysiology of pain, principles of pain management, and types of treatment and customization treatment plan for pediatrics and elderly patients [11].

Emergency physicians have a concern about contributing to the disease process of drug seeking patients that present to the ED. One study demonstrated that starting narcotics in the hospital does not lead to a life of drug addiction for a vast majority of patients. Four of 11,882 inpatients were found to become narcotic addicted while an inpatient [12]. Which patients become drug addicted is a difficult to determine because it is not a predictable event and represents an adverse idiosyncratic response in vulnerable individuals.

Drug seeking patients frequently use EDs, move from one provider to another, have uncoordinated care, obtain poor follow-up, present with difficult to prove complaints. Although problematic in addicted patients, agonists-antagonists and attempting to coordinate long-term care have been recommended. Drug addicted patients with acute pain is another diagnostic dilemma. Most Epps would reluctantly treat these patients with large doses of narcotic agents.

Drug seeking patients are difficult to identify and deal with. Although studies have tried to better understand prevent the drug seeking behavior of patients in emergency medicine, success has been limited. One study tracked the patients who were substance addicted to prescription drugs and found that 30 patients who met the definition had 12.6 visit per patient, visited 4.1 hospitals and used 2.2 alias. Two of these patients died during this tracking [13]. This study demonstrated that drug-seeking patients commonly returned to the same hospital and received prescription medications. Two studies attempted to find techniques to reduce drug seeking patients' use of an ED. In Calgary, the emergency physicians found the means to identify and communicate about these patients. The effectiveness of this process was not evaluated. In another study, the authors recommended that files of habitual ED users be kept and shared with other emergency department.

Emergency physicians could do better with dealing with patients who have acute upon chronic pain and those that have a pseudo-addiction [14]. It is essential to investigate why the patients with chronic pain have an acute episode whether from acute flares, inadequate pain management or desperation. These patients may need additional medications or are commonly depressed. In the psuedoaddicted patient, the patient is mistaken for a drug addict rather than someone who has not received adequate treatment for their pain. These patients tend to be drug hoarding, requesting specific drugs, clock watching and dose escalating. Appropriate understanding and timely analgesics is indicated for this patient type.

Patient Education at Discharge

Proper patient education begins with an adequate understanding of the options for pain control and the use of treatment adjuncts. Emergency physicians do a poor job at judging a patient's level of pain. In a study by Guru and Bobinsky, they found that physicians and nurses reported lower pain that their patients, many charts did not have pain scales documented and half the

patients did not have their pain relieved on ED upon discharge [15]. Patients also do not have an adequate understanding of how to use over the counter medication. Chan and others found that many patients were unaware of how to proper use OTC medications, adverse effects and potentially lethal associations [16].

The fundamentals of patient discharge from the ED needs to include individualized pain control, anticipating pain rather than reacting to it, patient controlled medication decisions and the use of combination therapy including adjuncts [17]. Successful pain relief in the ED may be indicative of appropriate medications for the outpatient treatment upon discharge. An example of anticipating pain treatment would be round the clock non-steroid anti-inflammatory medication with the addition of a narcotic agent for increased pain at the patient's discretion. Appropriate adjuncts for home use need to be encouraged as part of the discharge plan. Patients need to be informed about a treatment plan that entails an action plan for increased pain, understanding of adverse events and the use of adjuncts.

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Case Outcome

The patient rated their pain a 10 out of 10 upon arrival in the emergency department.

The patient was given oral ibuprofen in the emergency department with little pain relief, rating their pain a 9 out of 10. The patient was given an intramuscular injection of morphine with significant pain relief, rating their pain at 3 out of 10.

Although time consuming, the patient was educated in the emergency department about how to handle their pain. This education included use of non-steroidal anti-inflammatory agents round the clock for 5 days supplementing this medication with a narcotic combination agent. Because the patient was young active person, a decision was made to encourage limited activity rather than bed rest and not to add muscle relaxer to the treatment plan. The patient was referred to an occupational health program for back school.

Annotated Bibliography

1. Beyer, JE, Wells, N: The assessment of pain in children. Ped Clinic NA 1989;36:837-853.

The authors wrote an extensive review of pain assessment for pediatric patients. They reviewed various pain assessment tools for various age groups. A table of various methods for pain assessment broken out by age complete with a long reference list complements this article.

2. World Health Organization Pain Ladder

<http://www.who.int/cancer/palliative/painladder/en/>

The WHO recognized that pain treatment was an important goal many years ago and developed a model of the use of the ladder. Unfortunately, the WHO pain ladder was developed for patients with cancer. However, there is applicability for the use of varying agents and adjuncts based on a patient's level of pain.

3. The Cochrane Library. Oxford: www.cochrane.org.

The Cochrane Collaboration has performed a number of reviews of the effectiveness of various techniques in the treatment of low back pain. It is probably the most extensive list of treatment options including adjunct effectiveness. They reviewed the use of anticonvulsants drugs, hydromorphone, psychological therapies, and acupuncture for some acute and chronic pain and muscle relaxants, activity, exercise, non-steroidal anti-inflammatories, bed rest, lumbar support, back schools in back pain.

4. Porter, J, Jick, H: Addiction rare in patients treated with narcotics. NEJM 1980;302:123.

The only article that relates the prescribing of narcotic medications under physician control. This article was an editorial published in 1980 that found four patients out of 11,882 hospitalized patients who became narcotic addicted and did not have a history of prior addiction.

5. Guru, V, Dubinsky, I: The patient vs. caregiver perception of acute pain in the emergency department. J Emerg Med 2000;18:7-12.

The authors asked patients and the staff to rate the patient's pain before and after ED treatment on visual and analog rating scales. Physicians and nurses gave significantly lower scores than those reported by the patient.

Half the patients felt their pain was not relieved in the ED.

6. Cham, E, Hall, L, Ernest, AA, Weiss, SJ: Awareness and the use of Over-the-counter pain medications: a survey of emergency department patients. South Med J 2002;95:529-535.

The authors performed a prospective 21-question survey of patient's understanding of the use of over the counter pain medication on a random set of emergency department patients. Although two thirds of the study patients used OTC medications, 73% never discussed the use of OTCs with a physician. This study showed that patients are unaware how to use OTC medications and may use them improperly.

Questions

- 1. What is considered the best pain scale for adults?**
 - a. Visual analog scale
 - b. Numerical rating scale
 - c. Categorical rating scale

- 2. What are the keys for patient discharge?**
 - a. Individualized pain control
 - b. Anticipate pain control needs
 - c. Use adjunctive therapy in selected patients
 - d. Liberal use of narcotics
 - e. All of above

- 3. The Cochrane reviews found which of the following treatments effective for acute low back pain?**
 - a. Activity
 - b. Exercise
 - c. Bed rest
 - d. Back school
 - e. Lumbar support
 - f. A, b, c
 - g. All of the above

- 4. What percentage of narcotic use in the hospital results in addiction?**
 - a. <1%
 - b. 1-2%
 - c. 3-4%
 - d. >5%

- 5. What steps in the WHO pain guidelines recommend the use of adjunct therapy?**
 - a. One
 - b. Two
 - c. Three
 - d. All
 - e. none

Answers

1. Answer a.

Although most practitioners would agree that the numerical rating scale is the most practical, the visual analog scale is considered the most reliable.

2. Answer e.

One might question the liberal use of narcotics. However, there is little evidence that short course of narcotic pain medication is detrimental.

3. Answer a.

Activity is the only clear adjunct indicated for acute low back pain.

4. Answer b.

The number was found to be 4 in 11,882.

5. Answer d.

All steps in the WHO ladder recommend the use of adjuncts.

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