Implementing Non-Pharmacologic Pain Management Alternatives in the Emergency Department

Purpose
The need to address opioid overutilization and the subsequent sequelae of that overuse is clear. Opioids are a class of drugs that includes commonly prescribed pain relievers such as oxycodone, hydrocodone, codeine, morphine, and fentanyl, as well as the illicit drug heroin. Prescription drug abuse, pain-related emergency department (ED) visits, and unintentional opioid deaths have been on the rise since 1990. Drug overdose, driven by opioid addiction, is the leading cause of accidental death in the U.S., with over 35% of overdose deaths related to prescription pain relievers in 2017 (Centers for Disease Control and Prevention, 2019). Nearly 218,000 people died from prescription opioid-related deaths from 1999 to 2017 (CDC, 2019). More recently, combating the opioid overdose crisis through opioid prescription reduction is a major focus of multiple healthcare organizations, varying levels of government, physician and nursing academic bodies, and a number of primary health care insurers; the cost to not address it is measured not just in dollars, but in deaths, lives, and families destroyed.

The purpose of this topic brief is to help reduce opioid use and overdose deaths by providing emergency nurses with current information regarding nurse-initiated, non-pharmacologic methods to address pain in the ED. Implementation of a non-pharmacologic pain management program in the ED based on evidence-based research addressing the efficacy of alternative pain management techniques is also described.

Overview: Pain Mediation
Pain can be defined as an “unpleasant sensory, emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain, 2018). A signal of pain indicates we need to protect an area of the body and allow time to heal. If left untreated or exposed to ongoing noxious stimuli, acute pain could become chronic. Pain is a common complaint—as an impetus for provider visits, pain complaints rank highest amongst all (Weiss, Wier, Stocks, & Blanchard, 2014). The financial burden to healthcare consumers to obtain relief for acute and chronic pain numbers in the millions of dollars annually, not to mention the illnesses associated with disabilities related to pain, such as opioid overuse and depression. A thorough understanding of the pain response and the way pain is relieved is essential to choosing appropriate modes of treatment for pain.
The physiology of the pain response and the changes that take place in the body after the pain stimulus are related to transmission of pain in four stages (Todd, 2016):

- Transduction
- Transmission
- Perception
- Modulation

In the transduction stage, that painful needle stick is changed into a nerve impulse. Nociceptors (sensory receptors for pain) interact with thermal, mechanical, or chemical insults to cause chemical changes that create potential for an electrical signal (Dubin & Patapoutian, 2011). The larger the number of chemical reactions, the more severe the perception of pain, and inflammatory responses begin. In the second stage of transmission pain impulse travels along the nerve, crossing synapses and activating receptors on the next neuron. If the pain stimulus and its chemical responses are strong enough, the signal continues along the pathway. Perception is the third stage of the transmission pathway, and it describes the point at which the body becomes aware of pain and develops a plan to respond to it. Physical and emotional responses are just two of the major ways the body defines “noxious stimuli.” The last stage of the pain transmission pathway is modulation, where the reactions of the second order neurons can be supplemented or inhibited to increase or decrease pain.

The focus of pain relief strategies is to enhance or support interventions that inhibit the phases of pain transmission (Swift, 2018). Specific tactics may include inhibiting the ability of the nociceptors to change the painful stimulus into a nerve impulse (transduction), limiting the ability of the nerves to allow impulses to travel (transmission), inhibiting any inflammatory responses (perception) and scrambling the activation processes on the nerve pathway (modulation).

**Chronic Pain**

Pain is usually classified as either acute or chronic. Acute pain is characterized by a sudden onset and is most often the result of a clearly defined insult such as an injury. Acute pain resolves as the original injury heals. Chronic pain, on the other hand, is pain that persists beyond what is usually considered a normal healing time, typically more than three to six months (Treede et al, 2015). While pain serves an important evolutionary function, acting as a warning system that we are doing something harmful to our body, when pain becomes chronic it can have a profound effect on its victims, causing actual rewiring of the neural circuitry in the brain and spinal cord (Shiel, 2018). This can be seen on neuroimaging, which has also revealed that there is not just a single pain center in the brain but rather a complex and adaptive network that involves up to 10 different areas of the brain (Thernstrom, 2010). This network transmits information between two parts of the pain system: pain perception and pain modulation. These parts are constantly in communication with each other, and chronic pain is theorized to involve either an overactive pain-perception circuit or an underactive pain modulation response. In fact, research has shown that in patients with chronic low back pain, alterations in the brain's cortical structure can be seen that are consistent with disruption of the body's self-awareness of pain (Nishigami, 2018).

Utilizing MRI scanning, clinicians can visualize some of the ways in which the brain handles pain. These interacting neuromodulatory systems rely on endogenous endorphins as well as actual medications such as opiates for their effects. For instance, the brain will shut down the perception of pain if it receives signals through an NMS that pain relief has been administered, even when it hasn’t (the placebo effect). Interestingly, when two groups of subjects receive the
same dose of the same medication, those who are told that they are being given a powerful pain reliever receive better pain relief over those who receive the same medication in a more covert manner (Morton, Sandhu & Jones, 2016).

In the same vein, research shows that just thinking about pain can create pain. The brain will amplify perception of pain if an NMS communicates an individual is experiencing injury, even if they are not (the nocebo effect). Awareness of these facts is key to development of effective treatment plans for chronic pain patients (Phillips, Ford, & Bonnie, 2017).

It is essential for the emergency nurse to express acceptance of the patient’s reality of their pain and help them reframe it in order to move forward. Since most people believe that pain indicates injury or damage, an important first step is to allay that fear. One way of re-framing is to explain because the pain has been present for so long, it increases their sensitivity to painful stimuli, so when the original injury is gone the feeling may persist like “an echo in their brain.” (Ingraham & June, 2019).

**Nurse-Initiated, Non-Pharmacologic Interventions**

Optimal pain management in the ED is patient specific and uses a multimodal approach that includes pharmacologic and non-pharmacologic interventions. Due to the adverse effects associated with many narcotic analgesics, as well as potential for overdose, it is particularly important that emergency nurses understand the use of available non-pharmacologic treatments for patients suffering from pain. Non-pharmacologic treatment includes physical and psychological strategies to reduce pain levels and can be used as a first-line measure or as an adjunct in multimodal pain management.

Non-pharmacologic interventions can include cognitive-behavioral or physical approaches (Table 1). Some examples of cognitive interventions include distraction, relaxation or imagery, superficial massage, breathing techniques, music therapy, positioning or repositioning, cold or heat therapy, and other therapies. Distraction and music therapy have been well studied in the pediatric population as a method to reduce child’s perception of pain during procedural techniques (Bukola & Paula, 2017; Parlar Kilic et al., 2015; Short, Pace, & Birnbaum, 2017). Active re-warming or resistive heating involves using an external source to heat or warm the patient and has been evaluated as a method to decrease pain and anxiety in adult patients suffering from pain (Sakamoto, Ward, Vissoci, Eucker, & Heard, 2018). The use of transcutaneous electrical nerve stimulation (TENS) in conjunction with other therapies has shown moderate benefit in reducing acute pain (Grover, McKernan, & Close, 2018). Still, further research is needed to more completely understand the impact non-pharmacologic therapies have on patient’s pain in the ED and other settings.

Table 1  Non-Pharmacologic Interventions

<table>
<thead>
<tr>
<th>Cognitive-Behavioral</th>
<th>Physical</th>
</tr>
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<tbody>
<tr>
<td>Psychological preparation and education</td>
<td>Acupuncture (requires advanced practice provider order)</td>
</tr>
<tr>
<td>Distraction</td>
<td>Massage</td>
</tr>
<tr>
<td>Relaxation techniques</td>
<td>Comfort positioning</td>
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<tr>
<td>Music and singing</td>
<td>Cutaneous stimulation (requires APP order)</td>
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<tr>
<td>Guided imagery</td>
<td>Splinting (requires APP order)</td>
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<tr>
<td>Coaching</td>
<td>Heat/cold therapy (requires APP order)</td>
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<tr>
<td>Conversation and therapeutic communication</td>
<td>TENS</td>
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Some nurse-initiated non-pharmacologic interventions such as those discussed in Table 1 can be implemented in the ED without a provider’s orders and have the capability to help reduce pain. Emergency nurses should work closely with their organization to implement non-pharmacologic interventions as first-line therapy, in conjunction with traditional analgesic pain management. It is important that nurses continue to use research to provide evidence-based care that promotes quality health outcomes and reduces pain in the ED.

Implementation of a Non-Pharmacologic Pain Management Program

There are several barriers to and facilitators of successful implementation of non-pharmacologic pain management (NPM) programs. Barriers can be separated into five distinct categories: access, lack of awareness, patient-provider interaction, beliefs, and support systems (Becker et al., 2017). In order for an organization to successfully implement an NPM program, identification of existing barriers and facilitators is important as well as a comprehensive plan for educating the care team on available modalities (Becker et al., 2017).

Barriers

Barriers to successful implementation of NPM programs include the following:

- **Access**: Access difficulties include inability of the patient to gain entry to NPM programs. This could be related to transportation, cost, geographical location, or availability of alternative pain management options (Becker et al., 2017; Giannitrapani et al., 2018). There are numerous options available such as massage and acupuncture, but these two particular examples are not covered under medical insurance and typically require multiple sessions to achieve goals.

- **Awareness**: Lack of awareness and understanding of pain management modalities and pain response is a barrier for both prescribers and patients. There are many NPM programs available which are not widely advertised to patients. Giannitrapani et al. (2018) further categorize awareness into cultural themes including patient resistance, perceived lack of or actual lack of provider time, lack of leadership support of NPM programs, and lack of provider education and training.

- **Patient-Provider Interactions**: There is a lack of trust that non-pharmacologic methods are the most effective. Patients perceive if their provider offers alternative methods they are not offering the best plan of care for pain management (Becker et al., 2017). Often NPM take more time and commitment of behalf of the patient to work effectively whereas medication offers more timely relief with little effort on behalf of the patient. Giannitrapani et al. (2018) further categorize patient-provider interactions into cultural themes including patient resistance, perceived lack of or actual lack of provider time, lack of leadership support of NPM programs, and lack of provider education and training.

- **Beliefs**: There is a general belief by both providers and patients NPM are not as effective as pharmacologic methods (Becker et al., 2017, Giannitrapani et al, 2018).

- **Support Systems**: There is often a lack of support for NPM programs. This may be lack of psychosocial support for the patient, lack of leadership support for the clinicians, and lack of clinician support of or buy-in on practice changes (Becker et al., 2017)

Facilitators

Primary facilitators of successful implementation of NPM are empathy and compassion displayed by the caregivers and medical team and open communication (Becker et al., 2017). To successfully facilitate pain management using non-pharmacologic options, communication and shared decision-making between the care team and the patient is key (American Association of Nurse Anesthetists, 2016). This enables the patient to express their preferences and enables
the care team to determine and address gaps in understanding. Empathy and compassion can often be clouded when dealing with pain management. Caregivers who work in areas where they encounter patients requiring pain management may have reduced sensitivity toward certain populations.

It is clear there are conditions in which multimodality pain management regimen is key and even cases in which opioids must be prescribed. Individual care plans must include NPM options for greatest efficacy (Becker et al., 2017). Determining which NPM options are most appropriate for use, the organization’s leaders and clinicians must take into account the patient population served (The Joint Commission, 2018). The Joint Commission (TJC) (2018, p.2) outlines key points in the implementation of NPM:

- Active involvement in the medical, nursing, and ancillary team members who are able to conduct comprehensive multi-disciplinary assessments
- Monitoring or patient progress
- Determination of when non-pharmacologic techniques have been exhausted
- Adequate staff education and training
- Adequate patient and family education including selected modality and goals of plan of care

**Evidence for Efficacy of Alternative Pain Management Initiatives**

The Consortium Pain Task Force White Paper (Tick et al. 2018) notes that The Joint Commission revised its pain standard in 2015 and, since 2018, requires hospitals to provide non-pharmacologic pain care as a scorable element of performance. TJC lists a number of medications and treatments that might be utilized: non-opioid medications, such as acetaminophen and non-steroidal medications, and adjunctive medications, such as muscle relaxants and antidepressants, ketamine, cannabis (medical marijuana), nerve blocks, acupuncture, chiropractic care, and behavioral therapy. Evaluating alternatives to opioids for pain management became an important research focus.

In May 2019, The Pain Management Best Practices Inter-Agency Task Force published its final report. The report concludes that an important gap in caring for patients in pain is a lack of knowledge of complementary and integrative medicine during their hospital visit as well as for discharge referrals. The task force recommends further research in this field and consideration of the use of complementary therapy in patient treatment plans. It is in this area where nursing can have an important impact. There are many evidence-based complementary therapies within nursing scope of practice that can be initiated and integrated within the ED visit without necessitating a provider order.

Crawford, Lee, and Feilich (2014) noted the important role the patient has in their own healing process. In a systematic review of 146 randomized controlled trials, relaxation, guided imagery, and biofeedback were considered safe treatments, with relaxation being the most effective.

Schneider (2016, p.31) studied the use of music therapy on postoperative pain. She states that music therapy “… is … easy to use, poses no risk, and can be done without a physician order.” In a randomized clinical trial, Perlman et al. (2019, p. 380) studied the effects of massage therapy on patients with osteoarthritis of the knee. The study concluded that “subjects receiving massage demonstrated significant improvement in pain, stiffness and physical function.”

The American Holistic Nurses Association (AHNA) has published a handout titled *Pain Relief Tools for Patients & Self Care* on their website (2017). The recommended tools include deep breathing, progressive muscle relaxation, meditation, imagery and distraction. Further methods, characterized as “recognized nursing practice,” include heat, cold, massage, lavender, music, and laughter.
Research is showing positive results from the use of alternatives to opioids in the treatment of pain. Further research, education, and particularly, acceptance of complementary and integrated health initiatives, is needed to provide nurses with the ability to impact patient pain management upon arrival at the ED.

**Strategies for Patient and Family Education**

Education of patients presenting with pain complaints can be challenging. Patients often come with preconceived notions, which may include prescription of opiates. The role of educators and patient advocates is to manage unrealistic patient expectations and approach the encounter with an educated empathy. Additionally, ED personnel often hold personal biases or negative thoughts about “drug seekers” or “frequent flyers.” These biases threaten the nurse-patient relationship and can lead to a mistrust of the information provided.

Strategies for patient and family education need to address the three components of effective communication: the receiver (patient); the sender (clinician); and the message itself.

*Patient as Receiver*

Any trip to the hospital is stressful, and a trip to the ED even more so. Stress has been shown to interfere with learning (Vogel, Kluen, Fernández, & Schwabe, 2018), so it is incumbent upon ED nurses to keep this in mind as they plan and deliver patient education. Studies have revealed that a majority of patients preferred verbal delivery strategies, such as speaking with an expert, rather than just reading pamphlets or handouts (Marcus, 2014). That strategy had even greater significance for particular demographic groups, such as Hispanic respondents and those with less than a high school education (Marcus, 2014). Verbal strategies also have the advantage of bypassing literacy and reading ability issues.

Patients also tended to prefer a psychosocial approach, where learning is personalized to their own life perspectives. For instance, a significant fear of many people is that the presence of pain means that something catastrophic is wrong and that it is being overlooked (Kee, Khoo, Lim, Kho, 2018). Discussion should then focus on recognition and acknowledgement of the patient’s pain experience but that it is no longer serving its biologic warning function, to signal that something is wrong. Acknowledging their pain reality then enables suggestion of tactics to interrupt and change that faulty signal. Directly addressing the patient’s particular issues can help allay fear and lead to acceptance of alternative treatments.

In addition, in order to deliver effective education clinicians must have a basic understanding of a patient’s level of health literacy which the Agency for Healthcare Research and Quality (AHRQ) defines as “…the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (2016, p. 1). Failure to take health literacy into account can result in patients feeling talked down to, embarrassed by their lack of understanding, or just confused.

*Sender*

Patient learning is as affected by how the message is delivered as by the content of the message. Clinician attitudes affect patients’ attitudes, with poor clinician attitudes being linked to decreased patient satisfaction scores and a greater number of malpractice suits (Kee et al., 2018). When patients experienced what they perceived as a lack of understanding or lack of empathy, learning stopped.

In a study of junior doctors in Singapore, communication errors were identified in four main areas (Kee et al., 2018), namely:

- non-verbal (eye contact, facial expression and paralanguage)
• verbal (active listening and inappropriate choice of words)
• content (poor quantity and quality of information provided)
• poor attitudes (lack of respect and empathy).
In other words, patients who received information from a clinician they perceived as empathetic were happier and more likely to follow instructions.

In addition to delivering the message, the clinician needs to assess patient learning as well. One strategy that has received a lot of attention is the teach-back method. The teach-back method is used to assess understanding by asking the patient to repeat the lesson back in his or her own words (Marcus, 2014).

Message
Generally, from the patients’ point-of-view, pain indicates a problem. Therefore, the message needs to focus on the patient’s new reality, that the presence of pain does not necessarily equate to a problem. Helping patients understand the physiology of their pain can help them understand the shift in the focus of treatment from eliminating pain to addressing the impact of pain on quality of life. This approach is known as pain neuroscience education (PNE) (Wenger et al, 2018).

A recent study revealed that PNE was the educational format most effective at lowering patients’ self-assessed disability, in spite of the fact that pain levels themselves were not rated significantly differently. The focus of PNE is on teaching patients about the neural source of their pain, while emphasizing that degree of pain does not directly correlate with the degree of tissue damage. In PNE, the concept of “central sensitization” is explained so as to provide patients with a diagnosis that validates their pain experience and diverts their focus from peripheral pain generators. Following PNE, a correlation has been noted between success at achieving a better understanding of the neural foundation of pain and reducing fear avoidance beliefs. A decline in catastrophizing thoughts has also been linked to improved understanding of pain neurophysiology in people with chronic pain (Wenger et al, 2018).

Conclusion
Given the prevalence of pain as a primary complaint of patients seeking care, healthcare providers need to have access to non-pharmacologic pain management alternatives to assist in meeting patient needs without the use of opioids. Pain management can be complex, for both acute and chronic conditions, and requires a thoughtful, multi-faceted approach. Nurses can be an integral part of the treatment team by initiating evidence-based, non-pharmacologic interventions as a first line measure or as adjunct therapy. This approach makes it possible for a variety of options to be included in the pain management plan and avoids reliance on opioids as the sole treatment option. Nurses often spend the greatest amount of time with a patient, enabling in-depth discussions about the options to achieve the desired outcome, patient education, and patient acceptance and success of the program, with the hope of reducing adverse effects associated with opioid overuse. Implementation of a comprehensive treatment plan can help deter opioid overutilization and its sequelae.

Resources

**Patient Education**


**Provider Education**


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**Definitions of Terms**

**Acute pain**: Pain that is characterized by a sudden onset and is most often the result of a clearly defined insult such as an injury. Acute pain resolves as the original injury heals.

**Chronic pain**: Pain that persists beyond what is usually considered a normal healing time, typically more than 3 to 6 months.

**Complementary therapy**: Health care practices used in addition to standard treatments; when a non-conventional healing modality is used together with conventional medical modalities.

**Multimodal Pain Management**: A pain management approach that includes pharmacologic and non-pharmacologic interventions.

**Neuromodulatory System**: A network of endogenous endorphins in the central nervous system (including norepinephrine, serotonin, dopamine, and acetylcholine) that plays an essential role in disease conditions and is the primary focus of many pain treatment strategies.

**Nocebo Effect**: A pain response that occurs when patients dwell on negative thoughts of their pain, intensifying symptoms that are not really there.
Nociceptors: Sensory (pain) receptors that send messages to the spinal cord and brain to warn of damaging or noxious stimuli.

Pain: An “unpleasant sensory, emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain, 2018).

Placebo Effect: When the brain receives signals that pain relief has been administered, even when it has not, leading a patient to believe their pain or other damaging condition is reduced or relieved.

Synapse: The point between two neurons where communication of electrical nerve impulses occurs.

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