Pain Management in the 21st Century

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Abstract
Adequate pain management is largely underserved to patients not only in the US, but globally as well. Although there are well documented research and evidenced based practices that exist, they have not translated to current clinical pain management care for patients. The Committee on Advancing Pain Research, Care, and Education: Institute of Medicine, released a national publication in 2011 titled “Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education and Research” which addressed that effective pain management practices in the US are at best, not realized. Adverse consequences of ineffective pain management effect physiologic, psychological and social components in which various population groups uniquely experience, and can be life altering for patients having an intense impact on the patients’ quality of life. Multiple barriers contribute to ineffective pain management, the most critical being patient subjectivity. Improved pain management practices have been implemented, yet knowledge regarding pain management, physiology, science and research remain minimal.

ABBREVIATIONS

- APS: American Pain Society
- EBP: Evidence Based Practice
- CPG: Clinical Practice Guidelines
- WHO: World Health Organization
- HCP: Health Care Providers

INTRODUCTION
There are considerable deficiencies in the progress of best practice in pain management in the US. Numerous disparities in federal, state and institutional policies including treatments, approaches, education and research have placed patients with acute and chronic pain in vulnerable situations. Pain management is extremely complex without the best practice tools, knowledge and science applications. Evidence-based practice (EBP) research has been recommended by numerous national and international pain organizations such as the American Society of Anesthesiologists (ASA), American Pain Society (APS) which published Clinical Practice Guidelines (CPG) recommendations and American Society for Pain Management Nursing (ASPMN). Nonetheless, the translation of this knowledge to clinical practice has been negligent. Pain has been reported to be the most common reason a patient visits a physician and is the major reported and documented reason for an unanticipated post-op hospital admission or readmission. Pain is also one of the most common reasons for frequent visits to the Emergency Room for those who either do not have a pain specialist, or a primary care provider (PCP) who may not be proficient in pain control [1,2]. Pain is a non-forgiving burden with physical and emotional suffering that should not be discriminated against, nor fall out of the scope of recommended treatments [3].

There is significant need for improved pain management and analgesia therapies to negate consequences of unsuccessful acute pain management, which includes reduced quality of life, altered sleep patterns, impaired physical function, and potential physiologic consequences of ineffective pain control, specifically the risk and development of chronic pain [4]. Effective pain management not only promotes an earlier recovery, but enhances earlier mobility, lessens potential of an ileus, urinary retention, as well as cardiac and pulmonary complications [5,6]. The potential for depression and anxiety also significantly occur with mismanaged pain. Further benefits of adequate pain management include decreased length of hospital stay, lower readmission rates, earlier overall recovery, improved quality of life, increased productivity, lower economic costs of unrelieved pain for both the patients and the health care system, decreased hospital costs, as well as improved patient satisfaction [5,7-9]. Acute pain lasting greater than 3 months has the potential for negative effects on the central nervous system producing atypical activity of the immune system with increased susceptibility that furthers the development of disease states and in adventent psychological and decreased quality of life implications. Treatment will then need to be focused on the malfunctioning nervous system and not the signs and symptoms alone [10,11].

Multiple barriers contribute to ineffective pain management. One of the most critical is patient subjectivity. Mc Gaffery’s (1968), definition of pain states “Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing person says it is, existing whenever the experiencing 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it does" [12]. The prevailing barriers include: lack of qualified providers, lack of pain education provided in medical and nursing school curriculums, misconceptions and biases of nurses’, lack of appropriate pain assessment techniques and related patient misperceptions as a result of inadequate pain education.

Medical and nursing schools have been remiss in adequately educating our existing health care providers (HCP) with sufficient knowledge in pain management. The National Research Council has identified both the basic sciences of pain and accumulative clinical levels of experience as inadequate in both medical and nursing schools [10,13]. Pain management assessment core competencies have not been required for (HCP) and are currently not in development [14]. As of 2014, the World Report News identified 6,758 pain specialists in the US with overwhelming geographic inaccessibility's in some states [15]. Pain management thus diverts back to the primary care physicians with too few to carry the burden of pain management. The Nurse Practitioner Healthcare Foundation has recommended the development of a pain curriculum with improved training in the knowledge of opioid prescription [10,16], especially in chronic pain patients, which will place nurse practitioners in a significantly demanding role in the future of pain management.

Without a reliable pain assessment, effective pain management remains one of the most challenging barriers, and has minimal significance in achieving the ultimate goal of pain control. Effectual pain assessments are complex, and theoretically demands a thorough pain history in which a shared goal setting is developed with the patient that will ultimately lead to improved patient outcomes [17]. Proper pain assessment is essential in managing the patient’s pain; the HCP’s application and execution is essential in how that information is implemented into practice [10].

Research has reported that negative attitudes of the bedside nurse regarding pain management exists as a result of the lack of pain knowledge, along with the deficiencies of continuing pain education, has consequently contributed to impeded efforts from providing good patient care. [18,19]. As a looming result of the lack of provision of pain management knowledge, nurses have developed biases, or unwarranted negative ‘opinions regarding patients who seek or request pain medications, including both acute and chronic pain issues. Regrettably, these misperceptions have negated adequate delivery of pain management.

Balanced analgesia, or multimodal analgesia began its debut as best practice in the early 1990’s [20]. The advent of balanced analgesia has incorporated the combination of various multiple pharmacologic agents, opioids and non-opioids, in which the effects are interactive and purpose is to produce efficacious pain management [Table 1]. The central nervous system pain pathway and analgesic interventions modulates at various locations of the central and peripheral nervous system. Afferent nerves receive the pain stimulus, whereas efferent nerves convey the sensation to the muscles initiating a response [9] [Table 2]. Once activated, the sympathetic nervous system elicits a multitude of physiologic changes at the cellular level, releasing chemical mediators such as cytokines, catecholamines and inflammatory markers are causing additional tissue damage.

Proper pain management education can improve patient’s attitudes and perceptions of pain and is crucial on the impact of the patients reactions to the pain therapy provided [21]. The American Pain Society (APS) clinical practice guidelines recommends that pain education for both the patient and family begin in the pre-surgical phase which includes an explanation of the surgical procedure, expected post-operative phase including the causes and effects of pain, the options available post-operatively for pain management and the importance of early ambulation. Appropriate patient pain management education can also result in positive psychological outcomes, decreased anxiety and depression, and a sense of personal control and an improved sense of security and comfort for the patient [17,22]. Further, patient and family education in and of itself is paramount, and may be the most beneficial proactive treatment that HCP can provide.

Effective pain relief can be achieved with the implementation of current CPG recommendations. Interdisciplinary pain teams have been cited as one of the most fundamental and integral successful approaches for effective pain relief in the US. Numerous national pain organizations have identified the interdisciplinary team concept as the most prosperous. Members can include, but are not limited to, nursing staff, nurse managers, nurse directors, pharmacists, clinical nurse specialists, anesthesiologists, physician champions, patient advocates and physiotherapists [23]. The critical component is the astuteness in maintaining patient/family centered-care with individualized plans for each patient, which is essential in achieving effective pain management.

Table 1: Examples of Multimodal analgesic drugs options in the Postoperative Period.

| 1. Acetaminophen |
| 2. Nonsteroidal anti-inflammatory drugs |
| 3. Glucocorticoids |
| 4. Strong opioid agonists- (e.g. morphine, hydromorphone, fentanyl) |
| 5. Weak opioid agonists- (e.g. oxycodone, hydrocodone, tramadol) |
| 6. Local anestheisa wound infiltration |
| 7. Local anesthetic wound infusion |
| 8. Continuous peripheral nerve block |
| 9. Continuous epidural nerve block |
| 10. Continuous paravertebral block |
| 11. Transdermal analgesia patches (eg. Fentanyl, lidocaine) |

222 Postoperative Pain Management—Future Directions
Anesthesiology, V 112 • No 1 • January 2010 P. F. White and H. Kehlet
Table 2: Analgesia and the Pain Pathway.

<table>
<thead>
<tr>
<th>Injury/Trauma</th>
<th>Pharmacologic Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral nociceptor stimulation and release of noxious neurotransmitters</td>
<td>↓ Local anesthetic</td>
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<tr>
<td></td>
<td>→ Traditional NSAIDs</td>
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<tr>
<td>↑</td>
<td>→ COX-2 inhibitors</td>
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<tr>
<td>Peripheral nerves travel through ascending/afferent CNS pathways</td>
<td>↓ Local anesthetics</td>
</tr>
<tr>
<td>↑</td>
<td>↓ Opioids</td>
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<tr>
<td>Signal reaches dorsal root ganglion which synapses in the dorsal horn of the spinal cord</td>
<td>↓ Local anesthetics</td>
</tr>
<tr>
<td>spinothalamic tract to the thalamus and COX-2 specific inhibitors cortex</td>
<td>↓ Add centrally acting analgesics</td>
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CONCLUSION

The publication of "Relieving Pain in America" by the Institute of Medicine (IOM) 2011, addresses the need for a cultural transformation in the way pain is viewed and treated, pain as a public health challenge, the care of people with pain and challenges endured, educational barriers to both the public and the professional providers and cumbersome research challenges. Inequalities and ineffectual treatment of pain remains the foremost obstacles in providing patients the most effective pain management, and are the result of unsuccessful translations of research into practice. The needs are abundant, and includes the research and development potential of new analgesics, applying EBP methodology into practice, as well as the integration of interdisciplinary pain teams. The research today indicates a relentless disparity between understanding the science and pathology of pain and best practice treatment. Management of pain has been recognized as a basic human right by the World Health Organization (WHO) declaring "the unreasonable failure to treat pain is viewed as an unethical breach of human rights" [24].

Noteworthy advancing innovations have transpired in some medical practice paradigms focusing on the importance for more research in pain management. The concept of an interdisciplinary pain team providing pain management is convoluted, yet is essential in the delivery of exceptional patient care. The team provides significant acumen for the patient and is favorably correlated with improved patient recuperation, outcomes, knowledgeable HCP as well as patients, and improved patient satisfaction.

REFERENCES


