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Review Article

Advances in Postoperative Pain Management: A Nursing Perspective

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Abstract

An essential component of PACU nurses' everyday work is pain management. Many people still endure moderate to severe pain despite improved knowledge of pain and sophisticated pain treatment techniques. This article examines the variables that affect nurses' ability to manage pain. These factors include the challenges of assessing pain as well as the traits and training of the nurse. A summary of common misconceptions, their clarifications, and their practical ramifications is provided. There are recommendations for further education, such as raising nurses' awareness of pain management, broadening their knowledge base, and looking at individual characteristics and ingrained views.

Keywords: Postoperative pain, Pain management, Nursing role, Multimodal analgesia, Non-pharmacological interventions.

Introduction

Ward nurses are crucial to the challenging and inadequate management of postoperative pain.[1,2] Acute pain is a significant problem in the postoperative setting. Patients report a lack of information about pain-control measures and ineffective pain control. Nurses continue to rely on pharmacologic measures and tend to under-administer analgesics.[3]

Concept of Postoperative Pain

Reducing the adverse effects of acute postsurgical pain and facilitating a seamless return to normal activity are the objectives of postoperative pain management. The cornerstone of treatment for acute postoperative pain has historically been opioid analgesic medication. However, the overuse of opioids has raised calls for greater research into creating multimodal pain management techniques.[4]

The consequences of poor pain management are examined in this exercise, with a focus on the elevated risk of chronic pain and patient discontent. Students understand the importance of optimal postoperative pain management in terms of bettering immediate results, decreasing hospital stays, and raising patient satisfaction levels. The interprofessional team improves its ability to handle the challenges of postoperative pain management by taking this course, which eventually leads to better patient care and results. By working together, the medical staff guarantees all-encompassing care that tackles the various facets of postoperative pain.[4]

The goal of postoperative pain management is to lessen the detrimental effects of acute pain following surgery and facilitate the patient's return to regular activities. Acute postoperative pain has traditionally been treated mostly with opioid analgesic medication. However, there are growing calls for greater research into creating pain management techniques that prioritize the use of a multimodal approach due to the recent increase in morbidity and death linked to opiate abuse.[5]

Advances in Pain Assessment

The foundation of successful pain management is accurate pain assessment. Standardized and patient-reported outcome measures are the focus of recent developments.

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Scales for Pain Assessment

Unidimensional Scales for Pain Assessment

- ***Intensity-based assessment***

The severity of pain is the most crucial factor in the first evaluation and treatment of pain. Self-reporting scales such as the visual analog scale (VAS), face rating pain scale (FPS), verbal rating scale (VRS), and numerical rating scale (NRS) are frequently used in practice. Acute pain conditions, including trauma and postoperative pain, as well as chronic pain conditions like lower back pain, musculoskeletal pain, fibromyalgia, cancer, and palliative care, are among the many contexts in which these instruments are employed. It is crucial to assess both the ambulatory and static domains of pain in some circumstances, such as post-surgery instances. According to earlier research, a change in pain intensity of 33% or two points on the NRS or VAS would be considered clinically significant.[6]

- ***Types of assessment***

According to IASP, 10% of people have been observed to experience neuropathic pain, which is caused by a somatosensory system injury. To distinguish neuropathic pain, which is typically linked to co-morbidities and higher intensity that necessitates analgesia, disrupts sleep, and lowers the patient's quality of life, a variety of screening techniques comprising pain descriptors and examination have been created. The Leeds Assessment of Neuropathic Symptoms and Signs, the neuropathic pain questionnaire, the Douleur Neuropathique 4 items, the pain DETECT questionnaire, and ID Pain are the most often used instruments. Diabetic neuropathy, post-herpetic neuralgia, multiple sclerosis, back pain, post-stroke, and cancer are among the common disorders in which they have been used.[6]

Pattern-based assessment

A more thorough method is needed to evaluate pain in clinical practice. Mnemonic devices that aid in diagnosis and treatment are frequently employed. These mnemonic devices, which have been applied to both acute (like chest pain) and chronic (like neuropathic and palliative care) diseases, include PQRST, SOCRATES, and QISS-TAPED.[6]

Multi-dimensional Scales for Pain Assessment

Because of their simplicity and convenience of use, unidimensional pain measures are frequently employed in clinical practice. These instruments, however, are not very good at capturing the intricate and varied aspects of pain. Multi-dimensional pain assessment instruments, on the other hand, examine a variety of aspects of pain, such as sensory and emotional traits, pain localization, functional impairment, and temporal patterns.

Evaluation of Pain using Generic Multi-dimensional Instruments

Sleep disruptions, physical functionality, and emotional well-being are examples of quality-of-life indicators that are conceptually included in generic multi-dimensional pain assessment systems. The McGill Pain Questionnaire (MPQ), Brief Pain Inventory (BPI), Short Form-36 Bodily Pain Scale, Clinically Aligned Pain Assessment, Patient Impact Questionnaire, Multi-dimensional Pain Inventory, and West Haven–Yale Multi-dimensional Pain Inventory are all frequently used tools. For the evaluation of chronic pain in both cancer-related and non-cancer-related disorders, these instruments have been widely used.

Tools for Disease-Specific Pain Assessment: Palliative Care and Cancer

With reported rates ranging from 39.3 to 66.4%, pain is still very common in patients with advanced cancer even after receiving curative treatment. For the assessment of pain in cancer and palliative care settings, a number of multifaceted instruments are available. The most used tool is the Brief Pain Inventory (BPI). The Edmonton Symptom Assessment System, MD Anderson Symptom Inventory, Memorial Symptom Assessment Scale and its Short Form, and Symptom Distress Scale are further frequently used instruments.

Pain in the Musculoskeletal System

Pain linked to decreased dexterity, limited mobility, and functional limitations is a hallmark of musculoskeletal illnesses. Joints, bones, muscles, and the spine are among the several structures affected by these ailments, which include inflammatory disorders, including connective tissue diseases and vasculitides. Roughly 17% of years spent disabled worldwide are caused by musculoskeletal problems.

Cognitive impairment and dementia

An estimated 55 million people worldwide suffer from dementia. Because self-reporting may not be possible, especially in advanced stages of the disease, pain assessment in people with dementia frequently relies on observational methods. The Abbey Pain Scale, Non-Communicative Patient's Pain Assessment Instrument, Pain Assessment for the Dementing Elderly, Checklist of Nonverbal Pain Indicators, and the Pain Assessment in Advanced Dementia Scale are often utilized instruments in this demographic. Other tools like the MOBID-2 and DOLOPLUS-2 scales are also frequently utilized. Section 3.3.4 discusses additional strategies for critically ill, severely cognitively disabled, and non-communicative individuals.

Disorders of the Mind

An affective reaction to painful life events (like bereavement) or psychiatric disorders like depression is known as psychological pain, sometimes called psychache or mental pain. Suicidal behavior is significantly correlated with psychological anguish. Psychological pain is frequently measured using pain-specific tools like the Psychological Pain Scale, Mee–Bunney Psychological Pain Assessment, and the Orbach and Mikulincer Mental Pain Scale, in addition to general psychological distress scales like the Beck Depression Inventory and Hamilton Depression Rating Scale.[6]

Tools for Assessing Pain in Special Populations Children

Using assessment instruments intended for adults, children may find it challenging to comprehend and communicate discomfort. As a result, age-appropriate pain assessment tools have been created, such as observational scales for infants, toddlers, and kids with cognitive impairment and self-report scales for older kids and teenagers. The child's age, cognitive development, and capacity to express pain all play a role in choosing the right tool.[6]

Elderly

Due to the negative effects of pain on the elderly population, such as impairment in daily living activities, difficulty walking, and economic imbalance, sophisticated and suitable instruments are required to detect and measure pain in these individuals. Regardless of the score on the numerical rating scale, studies have demonstrated that MPQ reflects a lower score in the older population when compared to the younger population.[6]

Pain Assessment Tools

- Numerical Rating Scale (NRS)
- Visual Analogue Scale (VAS)
- Wong-Baker Faces Pain Scale
- Behavioral Pain Scale for non-communicative patients

Regular pain assessment, recording, and reassessment after interventions are the responsibilities of nurses. The nurse's involvement in pain monitoring has been reinforced by the inclusion of pain as the "fifth vital sign.[7]

Pharmacological Advances in Postoperative Pain Management

Modern pain management focuses on minimizing opioid use while maximizing analgesic efficacy.

Analgesia with Opioids

In the past, opioid drugs—such as morphine, hydromorphone, fentanyl, oxycodone, and methadone—have been the mainstay for treating acute postoperative pain, especially during operations like spinal surgery that cause excruciating agony. They mainly attenuate nociceptive pain signals by binding to μ-opioid receptors in the central nervous system. The development of tolerance, physical dependency, opioid-induced hyperalgesia, respiratory depression, sedation, ileus, and other gastrointestinal side effects are among the serious hazards associated with the use of opioids, despite the fact that they are an effective treatment for moderate-to-severe pain. Preoperative opioid use, postoperative dose escalation, chronic opioid use, and unfavorable postoperative outcomes—such as delayed wound healing, higher readmission rates, and increased mortality—are all clearly linked.[8]

Non-Opioid Painkillers

Because they act on different routes than opioids, non-opioid analgesics provide additional or synergistic analgesic effects while lowering the need for opioids and their adverse effects, making them fundamental to multimodal methods.

Because of its good safety profile, antipyretic and mild analgesic effects, and low risk of bleeding or gastrointestinal problems, acetaminophen (paracetamol) is used extensively. Although acetaminophen by itself might not be enough to treat moderate to severe postoperative pain following spine surgery, its use in conjunction with other medications (NSAIDs, opioids) dramatically lowers opioid use and may improve pain scores.[8]

Adjuvant Drugs

By focusing on particular pain pathways or amplifying the effects of other medications, adjuvant pharmaceuticals are useful supplements to basic analgesics. In order to minimize tissue edema, reduce surgical inflammation, and lessen postoperative pain and opiate use, corticosteroids, such as intraoperative or perioperative dexamethasone, are occasionally used. Regular use is restricted by worries about hyperglycemia, possible immune suppression, delayed wound healing, and increased risk of infection, especially at higher or repeated dosing, even though several studies report positive effects—such as reduced pain scores, opioid requirements, and improved range of motion.[8]

Non-Pharmacological Advances

Non-pharmacological interventions are increasingly recognized as effective adjuncts to pain management and align well with holistic nursing care.

Common Non-Pharmacological Interventions

Physical Therapy

A key component of non-pharmacological pain management for people recovering from spine surgery is physical therapy. Early mobilization enhances circulation, lessens discomfort, and averts problems like venous thromboembolism. It is frequently started during the first 24 to 48 hours following surgery.[9]

Interventions in Psychology

By targeting psychological factors that contribute to pain perception, psychological techniques, including cognitive behavioral therapy and mindfulness-based therapies, are important in the management of pain. CBT focuses on improving coping mechanisms, decreasing catastrophizing, and changing maladaptive pain-related beliefs and behaviors. Research demonstrates that CBT improves psychological outcomes while successfully reducing the severity of pain and the need for analgesics. According to a comprehensive study, compared to standard care, CBT during the perioperative phase may result in a postoperative decrease in pain and impairment in the short-term follow-up.[10]

Complementary and alternative medicine

Acupuncture, massage therapy, and transcutaneous electrical nerve stimulation (TENS) are examples of complementary and alternative medicine (CAM) methods that are becoming more widely acknowledged as useful supplements to pain management, especially in the postoperative context.[11]

These treatments improve patient comfort while being safe and economical. When it comes to putting these techniques into practice and instructing patients and caregivers, nurses play a crucial role.

Technological Innovations in Pain Management

Recent technological advances have improved pain control and monitoring.

Regional Anesthesia

Because they provide site-specific analgesia while reducing systemic opioid exposure and related side effects, regional anesthetic techniques have become crucial parts of postoperative pain treatment in spinal surgery. According to recent randomized trials and meta-analyses, the thoracolumbar interfascial plane (TLIP) block and the erector spinae plane block (ESPB) are two of the most successful regional anesthetic techniques.[12]

Modulation of neurons

SCS, PNS, and intrathecal drug delivery systems (IDDS) are examples of neuromodulation treatments that provide significant non-opioid alternatives for treating chronic and postoperative pain after spine surgery. Patients with persistent or resistant symptoms can benefit from these treatments, which alter pain transmission pathways at the spinal or peripheral level.

Stimulation of the Spinal Cord (SCS)

In patients with failed back surgery syndrome (FBSS), SCS has become a key neuromodulation strategy for treating chronic postoperative pain.[13]

Stimulation of Peripheral Nerves (PNS)

By focusing on particular peripheral nerves and placing subcutaneous electrodes to regulate nociceptive input, PNS offers a less invasive substitute for SCS. It has been demonstrated to lower opiate consumption and pain scores in a number of surgical populations, including those having spinal surgeries.[14]

Systems for Intrathecal Drug Delivery (IDDS)

Another neuromodulatory approach is IDDS, which administers analgesics like intrathecal morphine straight to the spinal cord. Up to 48 hours after surgery, intrathecal opioids offer prolonged analgesia while significantly lowering the need for systemic opioids.[15]

Role of Nurses in Postoperative Pain Management

The nurse's responsibilities include providing complete pain management in addition to administering medications.[16]
Key nursing responsibilities include:

- Pain management education for patients and their families
- systematic pain assessment and documentation
- administration and evaluation of analgesic medications
- advocacy for appropriate pain relief, and cooperation with the multidisciplinary healthcare team

Evidence-based guidelines and advanced nursing techniques have greatly improved postoperative pain outcomes.

Challenges in Postoperative Pain Management

Despite advances, challenges persist, such as:

- Inadequate nurse-patient ratios
- patients' underreporting of pain
- fear of opioid addiction, and a lack of pain management training

Future Directions

Regenerative treatments, AI-guided analytics, and more studies on long-term functional outcomes are some of the future directions. An evidence-based paradigm for managing pain after spine surgery is presented in this study, with a focus on the integration of multimodal and cutting-edge strategies catered to various patient demographics.[17,18]

Conclusion

By encouraging multimodal, patient-centered, and holistic approaches, developments in postoperative pain management have revolutionized patient care. Through precise assessment, evidence-based therapies, patient education, and advocacy, nurses are essential to the successful implementation of these advancements. Improving recovery, lowering complications, and raising patient satisfaction all depend on strengthening the nursing role in postoperative pain management. The standard of postoperative pain management will be significantly improved by ongoing professional development and the use of cutting-edge techniques.

Conflict of Interest

None.

References

1. Sullivan LM. Factors influencing pain management: a nursing perspective. J Post Anesth Nurs. 1994 Apr;9(2):83-90. PMID: 8158575.
2. Ene KW, Nordberg G, Bergh I, Johansson FG, Sjöström B. Postoperative pain management - the influence of surgical ward nurses. J Clin Nurs. 2008 Aug;17(15):2042-50. doi: 10.1111/j.1365-2702.2008.02278.x. PMID: 18705781.
3. Manias E, Bucknall T, Botti M. Nurses' strategies for managing pain in the postoperative setting. Pain Manag Nurs. 2005 Mar;6(1):18-29. doi: 10.1016/j.pmn.2004.12.004. PMID: 15917741.
4. Horn R, Hendrix JM, Kramer J. Postoperative pain control. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. Updated 2024 Jan 30. Available from: https://www.ncbi.nlm.nih.gov/books/NBK544298/
5. Bartels K, Mayes LM, Dingmann C, Bullard KJ, Hopfer CJ, Binswanger IA. Opioid Use and Storage Patterns by Patients after Hospital Discharge following Surgery. PLoS One. 2016;11(1):e0147972. [PMC free article] [PubMed]
6. Chandra, Sarangi S; Pooja, Gupta; Kaur, Makkar T; Ramesh, Dodamani1. Current Trends in Modalities of Pain Assessment: A Narrative Review. Neurology India 72(5):p 951-966, Sep–Oct 2024. | DOI: 10.4103/neurol-india.Neurol-India-D-23-00665
7. Pain Assessment Scales/Tools [Internet]. Pain Assessment and Management Initiative, College of Medicine – Jacksonville,

University of Florida. [cited 2025 Dec 19]. Available from: https://pami.emergency.med.jax.ufl.edu/resources/provider-resources/pain-assessment-scales/

8. Podder D, Stala O, Hirani R, Karp AM, Etienne M. Comprehensive Approaches to Pain Management in Postoperative Spinal Surgery Patients: Advanced Strategies and Future Directions. *Neurology International*. 2025; 17(6):94. https://doi.org/10.3390/neurolint17060094
9. Bonnet, F.; Marret, E. Postoperative pain management and outcome after surgery. *Best. Pract. Res. Clin. Anaesthesiol.* 2007, *21*, 99–107. [Google Scholar] [CrossRef] [PubMed]
10. Scarone, P.; Van Santbrink, W.; Koetsier, E.; Smeets, A.; Van Santbrink, H.; Peters, M.L. The effect of perioperative psychological interventions on persistent pain, disability, and quality of life in patients undergoing spinal fusion: A systematic review. *Eur. Spine J.* 2023, *32*, 271–288. [Google Scholar] [CrossRef] [PubMed]
11. Wu, M.S.; Chen, K.-H.; Chen, I.-F.; Huang, S.K.; Tzeng, P.-C.; Yeh, M.-L.; Lee, F.-P.; Lin, J.-G.; Chen, C.; Staffieri, F. The Efficacy of Acupuncture in Postoperative Pain Management: A Systematic Review and Meta-Analysis. *PLoS ONE* 2016, *11*, e0150367. [Google Scholar] [CrossRef] [PubMed]
12. Hong, B.; Baek, S.; Kang, H.; Oh, C.; Jo, Y.; Lee, S.; Park, S. Regional analgesia techniques for lumbar spine surgery: A frequentist network meta-analysis. *Int. J. Surg.* 2023, *109*, 1728–1741. [Google Scholar] [CrossRef]
13. Elkholy, M.A.E.; Nagaty, A.; Abdelbar, A.E.; Simry, H.A.M.; Raslan, A.M. Effect of spinal cord stimulation on quality of life and opioid consumption in patients with failed back surgery syndrome. *Pain Pract.* 2024, *24*, 261–269. [Google Scholar] [CrossRef] [PubMed]
14. Kaye, A.D.; Plaisance, T.R.; Smith, S.A.; Ragland, A.R.; Alfred, M.J.; Nguyen, C.G.; Chami, A.A.; Kataria, S.; Dufrene, K.; Shekoohi, S.; et al. Peripheral Nerve Stimulation in Postoperative Analgesia: A Narrative Review. *Curr. Pain Headache Rep.* 2024, *28*, 691–698. [Google Scholar] [CrossRef]
15. Rawal, N. Intrathecal opioids for the management of postoperative pain. *Best. Pract. Res. Clin. Anaesthesiol.* 2023, *37*, 123–132. [Google Scholar] [CrossRef] [PubMed]
16. Yüceer S. Nursing approaches in the postoperative pain management. J Clin Exp Invest. 2011;2(4):474-8. https://doi.org/10.5799/ahinjs.01.2011.04.0100
17. Bullock, W.M.; Kumar, A.H.; Manning, E.; Jones, J. Perioperative Analgesia in Spine Surgery: A Review of Current Data Supporting Future Direction. *Orthop. Clin. N. Am.* 2023, *54*, 495–506. [Google Scholar] [CrossRef] [PubMed]
18. Corley, J.A.; Charalambous, L.T.; Mehta, V.A.; Wang, T.Y.; Abdelgadir, J.; Than, K.D.; Abd-El-Barr, M.M.; Goodwin, C.R.; Shaffrey, C.I.; Karikari, I.O. Perioperative Pain Management for Elective Spine Surgery: Opioid Use and Multimodal Strategies. *World Neurosurg.* 2022, *162*, 118–125.e1. [Google Scholar] [CrossRef]