Patient Controlled Analgesia (PCA) for Hospice Care: Benefits and Risks -A Systematic Literature Review

ABSTRACT

Background: Patient controlled analgesia (PCA) is a method that allows patients to self-administer pain relief through an electronic pump, providing greater control over their pain management. PCA in hospice care is not just about pain relief it's about preserving autonomy, dignity, and comfort in the final stage of life. It ensures patients can respond to their own pain in real time, which aligns with the core philosophy of hospice which is patient-centered and compassionate care.

Objectives: This systematic review aims to understand risks and benefits regarding PCA for hospice care settings.

Methods:A comprehensive literature review was conducted using peer-reviewed journal articles, clinical studies, and public health reports. The review focused on the risks and benefits for hospice care setting. The following data was extracted from eligible articles: source, author, study purpose, location (country and care setting), sample, design and methodology, participant characteristics, and relevant results.

Results: Findings include information on the PCA devices, rationale for administration, efficacy, and safety, adverse events.We need to understand the benefits and risks of patient controlled analgesia (PCA) in hospice care because it directly impacts patient comfort, autonomy, and safety at the end of life. Knowing both sides will benefit clinicians, patients, and families to make informed decisions about whether PCA is the right tool for managing pain in hospice care settings. Overall, PCA use was found to be safe and effective, sometimes even preferable to other opioid administration regimens.

Conclusion: PCA is a valuable tool in managing pain for hospice patients, providing them with the ability to control their pain relief effectively. It is essential for clinicians to assess each patient's individual needs and capabilities to ensure the best outcomes in pain management at the end of life. By utilizing PCA, hospice care can enhance the quality of life for patients during their final stages.

Keywords:patient controlled analgesia, hospice care, risk,benefits,end-of-life,pain,safe

INTRODUCTION

Hospice care is a subset of end-of-life care, reserved for patients with a prognosis of six months or less, focusing entirely on comfort and quality of life. End-of-life care is broader, encompassing all care in the final stage of life, sometimes including curative treatments. Many of the most vulnerable portion of our population, the terminally ill and the dying, spend the final phases of their lives in pain and distress. Through hospice care, the resources exist to enable

patients to have effective and appropriate end of life care. Pain is one of the most common symptoms managed in hospice, and understanding who these patients are helps clarify why interventions like PCA (Patient-Controlled Analgesia) may be needed. Hospice prioritizes comfort over prolonging life at all costs. In hospice care, PCA is needed because it allows patients to manage severe, unpredictable pain quickly and independently, ensuring comfort and dignity at the end of life.Understanding PCA's objectives in hospice care helps clinicians, patients, and families make informed, compassionate choices. It ensures that pain management strategies are not only medically effective but also emotionally and ethically aligned with the goals of hospice: comfort, dignity, and quality of life.

Patient-controlled analgesia (PCA) is a type of pain management that lets you decide when you will get a dose of pain medicine. The most common opioids used in PCA devices are morphine, hydromorphone, fentanyl, and methadone. Intravenous(IV) or subcutaneous(SQ) are the most common routes of administration. PCA can also be used with epidural, intrathecal, or intraventricular opioid administration. In some cases, PCA may be a better choice to ease pain than calling the nurse to give you pain medicine. With PCA you don't need to wait for a nurse. You can get smaller doses of pain medicine more often. With this type of pain treatment, medicine is given through an IV (intravenous) line placed into your vein. A computerized pump attached to the IV lets you release pain medicine in prescribed intervals by pressing a handheld button. In hospice care, patients admitted with pain are typically those with advanced, life-limiting illnesses like cancer where the focus shifts from cure to comfort.

Unmanaged pain in hospice care is not just a medical problem it is a humanitarian and ethical challenge. Effective pain management, including PCA when appropriate, ensures that patients can live their final days with comfort, dignity, and peace, while families are supported in their caregiving role.

We need to know and understand the risks of PCA because pain relief alone is not enough; it must be delivered safely, ethically, and in a way that preserves dignity. Risk awareness allows hospice teams to tailor PCA use to the right patients, prevent harm, and reassure families that comfort is being achieved responsibly. Understanding the benefits of PCA will help ensure safe, compassionate, and effective pain management in hospice care. By recognizing its advantages, clinicians can select PCA for the right patients, families can feel reassured, and patients can experience comfort and dignity at the end of life.

Ethics approval

As per institutional review board(IRB) guidelines ethical approval is not applicable to this study because it did not involve direct human intervention. Therefore, ethical approval was not deemed necessary for this study as it falls outside the scope of requiring a formal ethics review.

Methods

A systematic literature review was conducted to understand the risk and benefits of PCA in hospice care settings.The review followed a structured search and selection process to enhance transparency and replicability. Searches were performed in PubMed and Google Scholar for articles published between 2016 and 2025. Studies were included based on the following criteria: Inclusion Criteria is by (i)Peer-reviewed journal article, (ii)Human studies involving hospice patients (iii)Articles that report the risk and benefits of PCA (iv)Articles written in English. Only original articles were included. Studies were excluded if they were (i)Animal or purely experimental laboratory studies without implications for human exposure; (ii)Editorials, letters, commentaries, and conference abstracts; (iii)Articles that did not provide sufficient methodological detail, (iv) Duplicated reports of the same dataset. The search process identified relevant studies, which were screened for relevance. Citation chaining from frequently cited studies was also used to identify additional relevant research. This methodology follows established standards for systematic literature reviews, ensuring transparency and replicability.

Results

The database search identified 503 articles. Following the removal of duplicates, 421 articles remained for title and abstract screening. Title and abstract screening excluded an additional 393 articles, leaving 28 articles that underwent full-text screening. The final sample included five peer-reviewed articles. Five studies met inclusion criteria. Findings include information on the PCA devices, rationale for administration, efficacy, safety, adverse events, risks and benefits of using PCA. Overall, PCA use was found to be safe and effective in hospice care institutions.

Figure 1: Flowchart Showing The Selection Of Included Studies

Total Articles found in journal articles, clinical studies, and public health reports
n=503 articles

Total articles that was removed due to duplication
n=82

Total articles remained for title and abstract screening

n=421

Total articles excluded after reading inclusion and exclusion
n=393

Total articles leaving articles that underwent full-text screening
n=28

Total articles with peer reviewed
n=5

Table 1. Summary of studies included in the review

Citation (First Author, Year	Study Location (Country)	Study Aim	Study Design	Key Findings

Lorenz (2008)	USA	To assess evidence about interventions to improve palliative and end-of-life care.	A Systematic Review	The systematic review identified interventions that could generate substantial improvement in the end-of-life experience. For example, the evidence base for improving cancer pain makes failing to relieve pain clearly unjustifiable.
Good (2009)	Australia	Demonstrate the safety, efficacy, and patient acceptability of intranasal sufentanil for cancer-associated breakthrough pain.	Prospective, open-label, observational study	This retrospective study serves as preliminary evidence for the safety and effectiveness of outpatient PCA.
Gardiner(2012)	UK	This study aimed to explore the attitudes of health care professionals to opioid prescribing in generalist end-of-life care.	Qualitative focus group study	Effective interprofessional working models need to be developed so that pain management for patients at the end of life is optimized.

Zheng (2017)	China	Evaluate clinical safety and efficacy of intrathecal drug delivery system used to treat intractable pain in patients with advanced cancer who required more effective pain management.	Prospective cohort-study	This study demonstrates the clinical efficacy of intrathecal therapy in improving pain control, functionality and overall quality of life for patients with refractory cancer pain.
Motta(2024)	Brazil	The study highlights nursing actions that promote patient safety when using the device.	Scoping Review	The importance of strategies aimed at promoting patient safety through patient and caregiver education, actions such as correct pump identification, double-checking of programming by nurses and the importance of standardizing procedures.

Good(2009) and Motta(2024) reported that PCA is an effective technology for controlling pain, and is also safe and effective in hospice care or end-of-life care. Strong to moderate evidence supports interventions to improve important aspects of end-of-life-care. Nurses or clinicians have an important role in educating patients and caregivers, preventing errors, and promoting patient safety by using PCA. Lorenz(2008) reports that addressed end of life, including terminal illness (for example, advanced cancer) and chronic, eventually fatal illness with ambiguous prognosis (for example, advanced dementia), and intervention studies (randomized and nonrandomized designs) that addressed pain, dyspnea, depression, advance care planning, continuity, and caregiving. Gardiner(2012) reported that PCA can be used for opioid therapy. Opioid Therapy is

central to the management of pain in the field of generalist palliative and end-of-life care, and international guidelines highlight the need for opioids to be used as part of a comprehensive strategy to treat pain therefore, PCA is also important in managing pain and used in hospice care institution many patients do not receive adequate pain control at the end of life because families think that opioid will kill the patient or their loved ones. Hospice care's goal is to make the patient comfortable until their last breath and the patient will die peacefully. Zheng(2017)also reported treatment of cancer-related pain could provide rapid and highly effective pain relief. Patients in hospice care usually have terminal disease, not curable. Patients who suffer so much pain. Patients who were suffering from intractable pain in advanced malignancies would benefit from long-term improvements of analgesia and life quality with less toxicity and opioid consumption. PCA represents a valuable option for cancer-related pain management so the patients can stay comfortable on hospice care if not given pain management, patients in hospice care will end up restless, agitated and in so much pain.

Discussion

PCA is more than a device, in hospice care settings, where comfort and autonomy are central, PCA fits exceptionally well. Across the studies and articles reviewed PCA offers significant benefits in managing pain for hospice patients, but it also comes with risks that must be carefully managed. PCA also offers several advantages for patients and clinicians.

Benefits of PCA in hospice care for patients

Patient Empowerment: PCA allows patients to self-administer pain relief, giving them a sense of control over their pain management. This can enhance their comfort and satisfaction during end-of-life care.

Immediate Pain Relief: Patients can receive medication on demand, which can be particularly beneficial for managing breakthrough pain. This immediate access can lead to better overall pain control compared to traditional methods where patients must wait for a nurse to administer medication.

Consistent Pain Management: PCA can help maintain a stable level of analgesia, avoiding peaks and troughs in medication levels that can lead to periods of uncontrolled pain or excessive sedation.

Reduced Need for Frequent Nurse Interventions: By allowing patients to manage their own pain relief, PCA can reduce the frequency of nurse calls and interventions, which can be particularly beneficial in hospice settings where comfort is paramount.

Ideal When Oral Routes Are Not Possible:Common in end-of-life care patient experiences dysphagia, nausea/vomiting, bowel obstruction, reduced consciousness. PCA via IV or subcutaneous routes bypasses these barriers.

Benefits of PCA in hospice care for clinicians

Benefits for Clinicians

Reducing the need for frequent nursing interventions: PCA allows patients to manage their pain independently, leading to fewer calls for nursing staff and less time spent on pain management.

Enhancing patient satisfaction: Patients who can control their pain often report higher levels of satisfaction compared to those receiving traditional, nurse-administered analgesia.

Improving pain control: PCA can lead to better pain control and a more comfortable recovery experience for patients.

Simplifying the pain management process: PCA provides a structured and automated approach to pain management, which can be more efficient for clinicians.

Reducing the risk of side effects: By allowing patients to administer pain medication on demand, PCA can help minimize the risk of side effects associated with traditional opioid administration.

Risks of PCA in Hospice Care

Complexity of Use: PCA devices require proper education for both patients and caregivers to ensure safe and effective use. Misunderstanding how to operate the PCA pump can lead to inadequate pain control or increased risk of overdose.

Opioid-Related Side Effects: The primary risk associated with PCA is the potential for adverse effects from opioid medications, including respiratory depression, sedation, nausea, and constipation. These side effects can be particularly concerning in hospice patients who may already be experiencing multiple health issues.

Overmedication Risk:If used properly, PCA may reduce the risks linked to opioids because you are less likely to be overtreated or undertreated. Make sure that you are the only person who pushes the button for pain relief. If friends or family members also push the button as a way to help you, there is the danger that you might get over sedated and have trouble breathing. Also, your healthcare team should explain to everyone that you don't have to push the button as often as allowed. You only need to press it if you need pain relief. If not properly monitored, there is a risk of overmedication, especially if family members or caregivers inadvertently assist the patient in pressing the PCA button. This can lead to dangerous levels of sedation and respiratory distress.

Monitoring Requirements: Patients using PCA need to be closely monitored to ensure that they are receiving the appropriate amount of medication and to manage any side effects that may arise. This can require additional resources and staff time in a hospice setting.

Careful planning and communication among healthcare providers, patients, and families are crucial to maximizing the benefits of PCA while minimizing its risks.

Special consideration:PCA is less suitable when patients:

a. do not have the cognitive ability to understand how to use a PCA device;

b. cannot physically manipulate a PCA (and does not have a care team who can manipulate the button for them);

c. have an anticipated need for parenteral opioids less than 24 hours.

Conclusion and Recommendations

This review provides understanding and essential to know risks and benefits of using PCA specially in hospice care settings. Understanding the risks and benefits of PCA is essential because it ensures that pain management in hospice care is both safe and aligned with patient-centered goals. PCA can offer rapid relief, greater autonomy, and more consistent

analgesia, but it also carries risks such as sedation, respiratory depression, and inappropriate use if the patient cannot safely operate the device. By fully understanding both sides, clinicians can make informed decisions, tailor dosing to individual needs, protect vulnerable patients, and communicate clearly with families. Ultimately, knowing the risks and benefits allows the care team to deliver effective, ethical, and dignified comfort care, which is the core purpose and goal of hospice are allowing patients with a terminal condition to die peacefully and enabling families to share in the patients' care, providing them with a more favorable memory at the end of life.

The following recommendations are proposed:

• Promote effective pain control: Knowledge of PCA benefits helps staff optimize comfort by using rapid, patient-initiated analgesia when appropriate.

• Ensure safe practice: Clinicians must understand PCA risks to prevent complications such as oversedation, respiratory depression, and inappropriate device use. Clinicians should be aware of the importance of patient selection, safety measures, and ongoing monitoring to ensure the safe and effective use of PCA.

• Identify appropriate candidates: Awareness of risks ensures PCA is only used for patients with the cognitive and physical ability to operate the device safely.

• Support patient autonomy: Understanding how PCA empowers patients allows clinicians to use it in ways that enhance dignity and control at the end of life.

• Guide individualized dosing: Clinicians must understand PCA mechanisms to tailor basal rates, bolus doses, and lockout intervals to each patient’s needs.

• Improve communication with families: Knowing both risks and benefits enables clear explanations that build trust and reduce fear around opioid use.

• Strengthen monitoring and safety protocols: Understanding PCA risks ensures consistent assessment of sedation, pain patterns, and device function.

• Align care with hospice goals: Knowledge of PCA’s benefits supports comfort-focused, patient-centered care while minimizing unnecessary suffering.

Understanding and implementing the recommendation to know the risks and benefits of Patient-Controlled Analgesia (PCA) is essential for ensuring safe, effective, and patient-centered hospice care. When clinicians are fully informed, they can prevent complications, select appropriate candidates, and tailor dosing to each patient’s needs. This knowledge also strengthens communication with families, supports patient autonomy, and promotes consistent, high-quality pain management. By integrating this understanding into daily practice, hospice teams can uphold safety, dignity, and comfort core principles of end-of-life care.

Conflict of interest

No conflict of interest has been declared by the authors

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