J. appl. health sci. 2026; 12(2): 73-79

Stručni rad

Nursing Approach to Patients Receiving HFNC Therapy During ERCP: Balancing Technology and Humanity

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Abstract

The introduction of high-flow nasal cannula (HFNC) therapy into endoscopic anesthesia has improved the safety of sedation, particularly in patients with limited respiratory reserve. In this context, the role of nurses extends beyond technical application and includes patient preparation, communication, monitoring, and early recognition of respiratory instability.

This paper aims to present a nursing approach to patients undergoing endoscopic retrograde cholangiopancreatography (ERCP) with HFNC support, with emphasis on clinical practice before, during, and after the procedure. Particular attention is given to reducing patient anxiety, building trust, and ensuring continuous monitoring to maintain respiratory and hemodynamic stability.

The findings indicate that the integration of technical competence, structured monitoring, and supportive communication contributes to patient safety and the quality of procedural care. The paper proposes a model of nursing practice that integrates contemporary clinical knowledge with the principles of humanistic and patient-centered care in procedural anesthesia.

Keywords: HFNC therapy, ERCP, nursing care, communication, holistic approach, patient anxiety, sedation safety

Article received: 03.09.2025.

Article accepted: 31.01.2026.

https://doi.org/10.24141/1/12/2/8

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Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is a complex diagnostic and therapeutic procedure used to visualize and treat pathological conditions of the biliary and pancreatic systems.[1] Due to its invasive nature and the patient's position, ERCP requires careful anesthetic planning and continuous monitoring, as alterations in respiratory mechanics and hypoxemia may occur, particularly in vulnerable patients. [2,3]

High-flow nasal cannula (HFNC) represents a significant advancement in respiratory support. HFNC delivers a heated and humidified mixture of high-flow oxygen that ensures a stable inspiratory oxygen concentration, flushes anatomical dead space, and improves alveolar ventilation.[4,5] Within procedural anesthesia, particularly during ERCP, HFNC has proven effective in preventing hypoxemia, reducing the need for airway interventions, and improving overall patient stability.[6,7]

In the context of ERCP with HFNC support, the nurse plays a central role in patient preparation, monitoring, and early recognition of complications.[8] A particular responsibility involves communication with patients who are in stressful situations and are uncertain about the outcome.

Before the procedure, many patients express fear of pain, choking, or potential complications during sedation. As the first healthcare professional to establish contact with the patient, the nurse plays a pivotal role in building trust and a sense of safety. Calming verbal communication, clear explanations of the procedure, and a professional presence significantly contribute to reducing anxiety.[9] At the same time, accuracy in the technical preparation of the HFNC system, as well as verification of flow, temperature, and oxygen concentration settings, requires a high level of professional competence and responsibility.

Modern nursing practice in procedural anesthesia is not limited to technical performance but encompasses the integration of knowledge, empathy, and ethical sensitivity. A holistic approach enables the nurse to recognize the patient as a whole person with physical, psychological, and social needs.[10] The nurse's role thus becomes central in bridging technology and humanity, ensuring that advanced medical equipment serves patient safety rather than replacing personal contact and compassionate care.

In the context of high-technology methods such as HFNC therapy, the nurse acts as a mediator between technology and the patient, ensuring that care remains aligned with professional and ethical principles.[11] Therefore, the successful application of HFNC during ERCP depends not only on technical expertise but also on the nurse's emotional presence, her ability to recognize patient anxiety, provide reassurance, and preserve the individual's dignity in moments of vulnerability.[12]

Therefore, the nurse's role in procedural anesthesia is viewed as a synthesis of scientific competence and humanistic practice. At the center of this approach lies the patient, whose safety, trust, and emotional stability are as important as clinical parameters. Such an integrated approach forms the foundation of modern nursing, which strives to achieve balance between technology, knowledge, and compassionate care for the individual. This paper focuses specifically on the nursing perspective in the use of HFNC during ERCP, integrating technical aspects of respiratory support with communication, patient preparation, and humanistic care, which are less frequently addressed in existing literature.

Aim, Purpose, and Methodology

The aim of this paper is to present the nursing approach to patients undergoing endoscopic retrograde cholangiopancreatography with the use of high-flow nasal cannula therapy, with particular emphasis on patient preparation, monitoring, communication, and early recognition of respiratory instability. The paper focuses on the integration of technical competence and humanistic nursing practice to ensure patient safety and quality of care during procedural anesthesia.

This paper is designed as a professional narrative review based on a critical analysis of relevant scientific and professional literature published over the past ten years. The analysis includes research articles, systematic reviews, and clinical studies related to the application of high-flow nasal cannula therapy in endoscopic anesthesia, with particular focus on the role of nurses in monitoring and supporting patients during sedation. Sources were retrieved from international databases, including PubMed, ScienceDirect, and CINAHL, as well as professional guidelines in anesthesiology and nursing.

Descriptive and analytical approaches were used to synthesize current knowledge and identify key elements of nursing practice that contribute to patient safety, respiratory stability, and effective communication in technologically demanding clinical environments.

Discussion

Nursing practice in procedural anesthesia today stands at a unique intersection of technology, ethics, and humanity. The advancement of medical devices, such as HFNC, has enabled safer control of respiratory function during complex endoscopic procedures, yet it has simultaneously raised important questions about how to preserve human presence and empathy within a technology-driven environment. In this process, the nurse occupies a central position, connecting the scientific and the deeply human dimensions of care through professional expertise, clinical experience, and emotional sensitivity.

Technological Aspect of Nursing Care

The development of HFNC therapy represents one of the most significant advances in modern anesthetic practice. This method provides a continuous supply of heated and humidified high-flow oxygen, thereby increasing the functional reserve of the lungs and reducing the risk of hypoxemia.[13] Although technology is often perceived as an independent guarantor of safety, its true effectiveness is determined by the quality, competence, and accountability of the healthcare professional operating it.

The nurse carries a significant responsibility in the implementation of HFNC therapy. The nurse must understand the physiological mechanisms of HFNC function, monitor flow parameters and oxygen concentration, and recognize subtle changes in the patient's breathing and vital signs. This level of responsibility requires not only technical knowledge but also a high degree of concentration, anticipation, and rapid response in the event of complications.[14] Any change in oxygen saturation, skin color, or respiratory rate must be interpreted in the context of the patient's overall condition, demanding clinical reasoning and experiential confidence. These nursing interventions directly contribute to patient safety, early recognition of respiratory deterioration, reduced anxiety, and effective team communication during ERCP procedures under HFNC support.

Technological competence extends beyond the mechanical operation of the device; it encompasses the ability to integrate technology within the broader framework of nursing care.[15] The nurse does not lose their humanity in contact with technology but rather gives it meaning by adapting it to the patient's individual needs.[11] In this way, their actions transcend the boundaries of technical excellence and become an expression of professional accountability, as every setting, every flow adjustment, and every decision directly influences the patient's outcome and safety. For this reason, technological competence in procedural anesthesia cannot be separated from communication, emotional support, and a holistic understanding of the patient, which together form the next essential dimension of nursing care.

Emotional and Communicative Dimension of the Nursing Role

Technological safety can never fully replace the psychological sense of security that a patient experiences through interaction with a nurse. Procedures such as ERCP are often accompanied by a pronounced sense of anxiety, particularly among elderly individuals and those with chronic illnesses. Fear of choking, pain, or possible complications creates tension that may affect breathing, blood pressure, and overall physiological stability.[16,17] For this reason, communication between the patient and the nurse holds crucial therapeutic value.

Nursing communication should be clear, calm, and adapted to the patient's emotional state. Explaining the procedure in simple and understandable terms, using a gentle tone of voice, and maintaining a reassuring presence have a strong effect on reducing anxiety.[18] In this way, the nurse acts not only as a technical intermediary between the patient and medical equipment but also as an emotional guide who helps the patient regain a sense of control and safety.

Empathy in nursing practice is a professional ability to recognize and understand the emotions of others, helping the nurse remain composed in stressful circumstances while maintaining a reassuring presence for the patient.[19] Such emotional intelligence develops through experience, self-reflection, and awareness of

the importance of interpersonal relationships as an integral part of the therapeutic process.[20]

Holistic Approach to the Patient

Holistic care represents the essence of the nursing profession. In procedural anesthesia, it gains additional importance because the patient often loses the ability to communicate verbally and actively express their needs during the procedure.[21] In such moments, the nurse becomes the patient's voice and guardian of safety. By observing breathing, movements, and facial expressions, the nurse interprets nonverbal signs of discomfort and responds before the problem becomes serious.[22]

This approach requires deep concentration as well as the ability to see the patient as a whole person rather than a sum of physiological functions. Holistic care encompasses concern for the physical, emotional, and spiritual aspects of the person, and in procedural anesthesia, this means providing a sense of safety and preserving dignity even when the patient is not fully aware of what is happening around them.[23]

Every touch, glance, or word contributes to a sense of calm and trust in the patient.[24] It is in this relationship that the essence of nursing is revealed, a presence that does not seek recognition but leaves a profound mark on the patient's experience.

Education and Professional Development

The high technical demands of HFNC therapy require continuous education and professional development of nurses. Constant knowledge renewal, adherence to updated guidelines, and participation in professional training are fundamental to ensuring safety in practice.[14] The introduction of simulation training, workshops, and team exercises contributes to greater confidence, strengthens competence, and fosters mutual trust within the team.[25]

Professional development encompasses not only technical education but also the enhancement of soft skills such as communication, teamwork, emotional stability, and ethical reasoning. A nurse who develops these competencies becomes aware of their professional value and the impact they have on the patient's experience.[26] A culture of lifelong learning, mentorship, and the exchange of experience among colleagues promotes professional maturity and strengthens the identity of the nursing profession.[27]

Education should also encourage a spirit of inquiry. Involving nurses in research on the safety of HFNC therapy, the emotional aspects of care, and the development of new educational models empowers the profession and contributes to building a solid scientific foundation for nursing practice. Such active participation in research processes enables nursing to establish evidence-based practice and elevate the level of professional autonomy and recognition of the profession.[28,29]

In patients undergoing ERCP with HFNC support, effective communication before sedation is particularly important, as it improves tolerance of the nasal cannula, facilitates positioning, reduces the sensation of choking, and enhances patient cooperation during the induction of sedation.

Team Collaboration and Ethical Responsibility

In procedural anesthesia, the success of a procedure largely depends on the quality of team collaboration. The nurse in this team acts as a coordinator, observer, and communicator. Clear and timely communication between the nurse, anesthesiologist, endoscopist, and technician is essential to prevent errors and ensure patient safety. In crisis situations, it is often the nurse who first recognizes early signs of patient deterioration and alerts the team to the need for prompt intervention.[30] During ERCP procedures with HFNC therapy, this collaboration is especially important in situations of desaturation, hypoventilation, or airway obstruction, where rapid communication and coordinated response of the team directly influence patient safety and procedural outcomes.

The nurse's ethical responsibility is an integral part of every decision and action. It is reflected in the way the nurse respects the patient's dignity, protects their privacy, and ensures informed consent (31). The ethical principles of beneficence, accountability, and respect guide every professional action, especially in situations in which the patient is not fully aware of their surroundings and their trust relies on the professional integrity of healthcare personnel.[31]

The nurse thus becomes a moral reference within the team, reminding the team that behind every clinical case stands a human being with fears, hopes, and a right to dignity.[32] Their ethical presence is expressed not only through their actions but also through their way of thinking, decision-making, and communication within the interdisciplinary team.[33] Maintaining moral clar-

ity and compassion in a highly technological environment requires inner stability and professional maturity. This balance between scientific precision and human warmth forms the foundation of the trust that patients place in the healthcare team. In doing so, the nursing profession reaffirms its vital role in preserving the ethical integrity of the healthcare system and promoting a culture of safety, respect, and humanity in everyday practice.

Recommendations for Further Research

To ensure the continued advancement of nursing practice in procedural anesthesia, it is necessary to conduct systematic research on the effects of HFNC therapy on clinical outcomes, as well as on the emotional and psychological experiences of patients. Future studies should also include the evaluation of educational programs focusing on the integration of technical and communication skills, along with assessments of nurses' emotional intelligence in relation to patient safety.

Qualitative studies exploring nurses' personal experiences with HFNC therapy could provide deeper insights into emotional strain and professional resilience. At the same time, the development of standardized protocols and checklists is recommended to help harmonize practice and enhance patient safety.

Further research should also address the sustainability aspect of HFNC technology use, aiming to reduce resource consumption and strengthen the ecological responsibility of healthcare institutions. Such an approach reflects the modern vision of nursing as a profession that unites science, ethics, responsibility, and care for future generations.

Conclusion

Nursing care during the application of HFNC therapy in endoscopic retrograde cholangiopancreatography plays an important role in ensuring patient safety, respiratory stability, and overall procedural quality. The role of the nurse extends beyond technical execution and includes patient preparation, monitoring, communication, and early recognition of complications.

The successful implementation of HFNC depends not only on professional knowledge but also on the ability to integrate technical competence with effective communication and supportive care. Such an approach contributes to reducing patient anxiety, improving team coordination, and maintaining a high level of safety during ERCP procedures.

The integration of technical competence and humanistic nursing practice represents an important element of contemporary procedural anesthesia and supports the further development of safe and patient-centered standards of care.

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SESTRINSKI PRISTUP PACIJENTIMA PRIMANJEM HFNC TERAPIJE TIJEKOM ERCP-A: BALANSIRANJE TEHNOLOGIJE I HUMANOSTI

Sažetak

Uvođenje terapije visokoprotočnom nosnom kanilom (HFNC) u endoskopsku proceduru pod anestezijom unaprijedilo je sigurnost sedacije, osobito kod bolesnika s ograničenom respiratornom rezervom. U tom kontekstu uloga medicinskih sestara nadilazi tehničku primjenu terapije te uključuje pripremu bolesnika, komunikaciju, praćenje stanja i rano prepoznavanje znakova respiratorne nestabilnosti.

Ovaj rad ima za cilj prikazati sestrinski pristup bolesnicima koji se podvrgavaju endoskopskoj retrogradnoj kolangiopankreatografiji (ERCP) uz potporu HFNC terapije, s naglaskom na kliničku praksu prije, tijekom i nakon zahvata. Posebna se pozornost posvećuje smanjenju anksioznosti bolesnika, izgradnji povjerenja te kontinuiranom praćenju radi održavanja respiratorne i hemodinamičke stabilnosti.

Rezultati ukazuju da integracija tehničkih kompetencija, strukturiranog praćenja i podržavajuće komunikacije pridonosi sigurnosti bolesnika i kvaliteti proceduralne skrbi. Rad predlaže model sestrinske prakse koji povezuje suvremena klinička znanja s načelima humanističke i na bolesnika usmjerene skrbi u proceduralnoj anesteziji.

Ključne riječi: HFNC terapija, ERCP, sestrinska skrb, komunikacija, holistički pristup