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Hand hygiene and infection control in chest drain care: best practices for nurses

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Background: The nursing therapy for patients requiring air, fluid, or pus drainage from the pleural cavity is called chest drain management. This encompasses those with empyema, pneumothorax, pleural effusion, and other thoracic conditions. Handling, responding to, and supervising patients fit for chest tubes depend totally on nurses. Regarding caring for chest drains, past research show that nurses often depend on unofficial resources such peer interaction and personal experience instead of official resources including guidelines, seminars, or conferences. Notwithstanding its significance, the lack of consistency in this unofficial knowledge exchange could affect patient outcomes. Estimating the possibility of dangers and problems related to the chest tube installation depends on the first step of nursing therapy, assessment, which also helps to organize effective therapies. By means of evidence-based recommendations, provision of ongoing education, and creation of customized treatment plans, one can improve patient outcomes and reduce challenges.

Aim: The aims of this study are to investigate how nurses now manage patients with chest drains, how effective are formal and informal educational resources for chest drain care, and how might the nursing process—especially assessment and critical thinking—improve patient outcomes with respect to chest tube placement and maintenance.

Conclusion: This paper stresses the need of a rigorous, evidence-based approach for treating chest drain in nursing practice. While formal education, training, and adopting research-based standards are considerably more required, sharing information among colleagues depends on informal contact. By means of in-service education, seminars, or university courses, access to current resources will let nurses significantly reduce problems including infection, dislodgement, and bleeding. When nurses tend to patients with chest drains using critical thinking and a patient-centered approach all through the nursing process, they contribute to enhance patient outcomes and reduce incidence of adverse events.

Keywords: Chest drain management, Nursing care, Evidence-based practice, Critical thinking in nursing, Nursing assessment.

Introduction

Nurses have access to a wealth of resources, such as in-service education, libraries, conferences, seminars, university education, and peer-reviewed conversations, to ensure they stay current on treatment information for patients requiring chest drains. Prior research that aimed to compare variables affecting the evolution of evidence-based practice found that nurses depend substantially on personal experience and interaction with colleagues, rather than formal sources of knowledge. Also, when asked where they get the most up-to-date information on chest drain care, 62% of nurses surveyed by Mander and colleagues said that word of mouth amongst coworkers.

A first nursing assessment is the first of five steps in the nursing process. This step comprises continuously and methodically gathering data, classifying, analyzing, and arranging it. Lastly, the results are documented and communicated. In nursing, the ability to think critically is essential because it provides a road map for decision-making that impacts the patient's care plan, which may include evidence-based practice standards. According to Dunham and MacInnes (2018), a more effective method than a trial-and-error, one-size-fits-all strategy is precision

education, which involves customizing treatment to meet everyone's cultural, spiritual, and physical needs.

Assessing a patient's mental, social, spiritual, physical, and overall health is an important aspect of nursing care. A comprehensive evaluation of a patient begins with this. This approach incorporates the collection of subjective and objective data. The evaluation includes taking the patient's temperature, breathing rate, heart rate, blood pressure, and pain level using a pain scale that is designed for their age or condition. By enabling a nursing diagnosis to be formed, the assessment helps the patient identify their present and future care requirements. According to Jamieson et al. (2019), nurses can help establish care priorities by understanding the patient's normal and aberrant physiological processes.

Subjective and objective data, together with the patient's psychological, family, medical, and surgical histories, are all part of the nursing process. Based on our clinical judgment, we then assess and diagnose the patient's condition. The first step in care planning is to make a list of all your objectives and potential outcomes. The next step is to put your strategy into action by doing the intervention or activity. Lastly, you need to assess the outcome of your intervention to see how effective it was.

Recently published studies by Jamieson et al. (2019) There are five interrelated steps that make up the nursing process, which provides a framework for patient-centered care. Topics covered include diagnosis, evaluation, planning, and assessment. In the first step, known as assessment, information gathering and analytical thinking are required. Assessment can be subjective as well as objective. One type of subjective data is verbal feedback given by patients or caregivers.

Physically quantifiable traits including height, weight, vital signs, and food consumption and output make up objective data. Primary caregivers, who may or may not be related to the patient, or the patient themselves may provide information. Friends can be involved in data collection to some extent. Electronic health records facilitate evaluation as well as data entry. Because evaluation requires analytical reasoning, curriculum changes based on concepts are essential (Toney-Butler TJ, Thayer; 2023) for students.

Studies conducted by Shih and colleagues in 2019 demonstrated that using clinical judgment to develop a nursing diagnosis helps in planning and implementing patient treatment. Nurses have access to the most recent version of the North American Nursing Diagnosis Association's database of nursing diagnoses (NANDA). What constitutes a nursing diagnosis, according to NANDA, is a clinical judgment on how to respond to present or future health concerns impacting the patient, their family, or community. To better organize and guide treatment, nursing diagnoses are based on Maslow's Hierarchy of Needs. A hierarchy that accounts for each person's basic requirements was created by Abraham Maslow in 1943. Getting one's basic needs addressed is a prerequisite to achieving more abstract aspirations like self-esteem and self-actualization. The necessity to address physiological and safety problems is the foundation of nursing care and interventions. As the base of Maslow's pyramid, they guide one's emotional and physiological well-being.

Feeling secure in one's own skin, believing in one's talents, taking responsibility of one's life, and accepting one's appearance and body type are all components of a good dosage of self-esteem. Emotional Bonds and Loving: Protect yourself from bullying and other forms of social isolation by developing healthy relationships, learning to listen attentively, engaging in therapeutic conversation, and experiencing sexual intimacy. Toney-Butler TJ, Thayer (2023) state that in an

enabling setting, one can grow one's spirituality, empathy, and understanding of other people's perspectives to their fullest potential.

The planning phase is where EDP-based goals and outcomes have the most direct influence on patient treatment. The key to a successful outcome is setting and meeting goals that are unique to each patient. Nursing care plans are of the utmost importance now. Care plans outline a strategy for tailored medical treatment. When planning treatment, we take the patient's general health and any co-occurring disorders into account. Care plans improve treatment continuity, documentation, communication, and reimbursement. Accurate, meaningful, clear, quantifiable, and time-bound goals are essential. Achievable and action-oriented goals are also recommended. Toney-Butler TJ and Thayer devoted the year 2023. What the nurses call "implementation" is really doing the things they said they would do in the care plan. Medications, normal treatment procedures, EDP protocols, a heart monitor, and oxygen should all be part of the direct or indirect care that nurses deliver at this period.

The final phase of nursing care, evaluation, is critical for a good result for the patient. Medical professionals must reevaluate their interventions and therapies if they wish to determine their efficacy. The patient's general condition will determine how often they need to be evaluated. As more information becomes available from assessments, treatment plans may be adjusted. In the treatment of respiratory disorders, nebulization therapy serves a special and important purpose. Its numerous benefits include a wide range of respiratory illnesses it has been used to treat, a minimal risk of side effects, an established effectiveness, and a quick commencement of action. Patients of all ages, including those who rely on mechanical breathing, have cognitive impairments, are unable to utilize other inhalation devices, or are young, should benefit from nebulization therapy (CCEP, 2019).

Its true value lies in the treatment of life-threatening conditions such as aspiration-induced lung injury, acute respiratory episodes, severe pneumonia, acute laryngeal obstruction, acute respiratory infection, respiratory distress syndrome, acute respiratory failure, and so on. Nebulization therapy meets the requirements for emergency care before and after hospitalization, which include therapies that are fast, effective, safe, user-friendly, and widely available (CCEP; 2019).

The effectiveness of home maintenance treatment for chronic obstructive pulmonary disease (COPD) relies on the cleanliness and upkeep of the nebulizer. Patients and caregivers should be informed about the importance of hygienic cleaning, disinfection, and the correct usage of nebulizers. Patients with COPD should regularly clean and disinfect their nebulizer accessories to prevent infections, which can have a significant effect on lung function and general health (Ari and Restrepo; 2012).

Patients with chronic obstructive pulmonary disease (COPD) should have their nebulizing treatment monitored regularly, with assessments taking place every six months, to make sure the medicine is safe and effective (Ghoshal et al., 2017). There was a 43% decrease in contaminated nebulizers and a marked improvement in daily maintenance after a single educational intervention for home nebulizer use in which patients and caregivers got both verbal and written instructions. One way to access the pleural space is using a thoracostomy tube, which is a thin and flexible tube that is passed through the chest wall and inserted between the patient's ribs. The diameter of a thoracostomy tube, which is usually composed of silicone or PVC, can vary from six to forty French.

Most of the tubes have radiopaque stripes and fenestrations running along the insertion end's sidewalls. The device that evacuates the pleura is attached to the distal end of the tube after

insertion. The three steps that comprise a pleural-evac are collecting, water sealing, and suctioning. Instead of returning to the chest cavity, air can use the water seal chamber to escape gravity (Goncalves and Jabuonski; 2018).
The surgeons can make the chest cavity pressurize, letting the lungs re-expand, by inserting a chest tube. Pleural effusion, hydrothorax, pneumothorax, chylothorax, and empyema are all fluids or airs that can be drained from the intrathoracic region with its assistance. A thoracostomy tube can also be used for other, less common, and rarely suggested purposes. Rapid insertion of a chest tube should follow needle decompression for tension pneumothorax in patients who have stabilized, as stated by Ravi and McKnight (2023).

Assuming the condition is benign, most patients who need a chest tube for pneumothorax, empyema, or pleural effusion have good results. Problems including bleeding, damage to internal organs, and even dislodgement are unfortunate outcomes that can occur because of chest tubes. Between one percent and ten percent of a full institution's population may be impacted by these difficulties. More comfortable and less painful than older tubes, smaller chest tubes have become available in the past twenty years (Santos et al., 2019).

Healthcare professionals' contaminated hands are the primary vector for the transmission of most infections. A reduction in the probability of infection, total healthcare expenses, duration of stay, and reimbursement can be achieved by the control of microbial transmission, which can be achieved with proper hand hygiene.
The Centers for Disease Control and Prevention (CDC) recommends that people form the habit of regularly washing their hands as the first line of defense against the transmission of infectious diseases in healthcare settings. Research shows that medical professionals still have a limited understanding of the significance of cleanliness, and compliance is low, even if this evidence is present (Gold et al., 2022).

Scrub your hands thoroughly with an alcohol-based handrub using a palmful. Following the steps outlined in Figure 1 (Widmer et al., 2007), it is important to rub the hands until they are totally dry. Coat all surfaces with a mixture of water and soap that you make with your palms. After washing your hands with water, pat them dry with a paper towel. Whenever feasible, use water that is clean and flowing. Hot water is a known irritant for those with dermatitis (IB). A towel can be used to cover the tap or faucet (IB) to turn it off. Just make sure your hands are dry; disinfection measures aren't necessary. Make sure that no one is using the same towel at the same time (IB). The process of washing one's hands is illustrated in Figure 2. Bar, powdered, liquid, or leaf soaps are the best options. It is advised to dry bar soap by placing it in racks that provide drainage (II) (WHO; 2009).

Figure (1): Hand rubbing (Spruce; 2013)

Figure (2): Hand washing (Saha et al; 2021)

Healthcare workers' protective gear was previously unknown until the height of the COVID-19 pandemic. Commonly, the Centers for Disease Control and Prevention (CDC) and the Occupational Safety and Health Administration (OSHA) establish standards for personal protective equipment (PPE). Ensuring the availability, proper utilization, and proper disposal of

personal protective equipment are essential elements of a healthcare system that places a premium on safe patient care, assert Kening and Groen (2023).

Wearing protective gear is common practice for healthcare personnel to safeguard themselves from potentially hazardous occupational exposures. Chemical, biological, radioactive, and nuclear power pollution threats are ubiquitous in hospital environments. (Groen and Kening, 2023) In this piece, we'll look at PPE from a healthcare perspective.

Healthcare workers can lessen their exposure to infectious diseases and safeguard themselves and their patients by wearing appropriate personal protective equipment (PPE). With any luck, this will lead to higher worker retention rates and reduced stress on the healthcare system. Designing personal protective equipment (PPE) with the user's safety and comfort in mind is of the utmost importance during manufacture. Second, it's important to note that the level of compliance with PPE regulations can be greatly affected by insufficient training and education. The security of PPE relies on the correct procedures for donning and doffing it (McCarthy et al., 2020).

When caring for patients, nurses often help with procedures such as inserting, managing, and removing chest drains. It is possible to manage a patient's pre- and post-chest drain nursing care on one's own. The nurse checks that everything is ready for the procedure before it begins, makes sure the patient is in the correct posture, gives them their analgesics and sedative, makes sure they are informed, and makes sure they have a good reason to have the surgery. Caring for the wound site, keeping track of the drain's output, keeping the underwater seal in place, and keeping the client and their family informed are all part of the nurse's duties. According to Abuejheisheh et al. (2021), the chest drain is removed once its intended function has been met.

Conclusion

Studies like this underline the significance of nurses keeping current knowledge and techniques when treating patients showing chest discharge. Even if many nurses have access to many official resources like in-service education, libraries, conferences, and university courses, many still depend on unofficial sources—especially talks with colleagues—for practice guidance. Dependency on peer communication rather than conventional teaching methodologies could lead to differences in treatment and maybe negative effects on patient outcomes.

If one wishes to deliver outstanding, customized therapy, the nursing process must be followed. Methodical diagnosis, assessment, planning, completion, and review define this process. Through evidence-based approach adoption and critical thinking, one can treat chest drains better, lower issues, and so promote better patient health outcomes. Although peer-to-peer learning has enormous value, the results clearly show that additional official, structured training materials and revised policies are required.

For the benefit of their patients, nurses should make more frequent use of official educational materials to keep current on the most recent evidence-based therapies. Healthcare systems should also help and permit nurses' quest of ongoing professional development to raise their degree of knowledge in chest drain management, both in theory and in practice. Though knowledge exchange depends on peer communication, eventually formal, evidence-based education has to be introduced into nursing practice if we are to improve patient outcomes, lower the occurrence of problems, and raise the quality of patient care.

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