

INTENSIVE CARE UNIT - THE ROLE OF THE NURSE IN PATIENT TREATMENT

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Abstract: Intensive care units have been developed for the purposes of disposal of life threatened patients. The beginnings of intensive care were in surgical "shock" rooms which were used during the time allocated independent intensive care units led by anesthesiologist.

The units can be open or closed. In the open units every patient has his doctor that comes when it suits him or to call. In the closed units doctors and nurses constantly work and is responsible for everything that happens in the unit. Working in intensive care is teamwork. Exactly one knows who is responsible for which part. The determination and provision of treatment and rest. Basic control in the ICU is very important to timely detect possible complications of treatment and other issues that can occur as an unfavorable course of treatment. The nurse should be constantly visit patients, provide a complete care, and observe and notice the changes in patients. The remainder of this paper will show that the indications for the reception of patients, organization of work in the ICU, the demands of nursing care, the type of monitoring that are used, burnout in intensive care and special training of doctors and nurses.

Keywords: intensive care, nurse, nursing care, monitoring

1. INTRODUCTION

In their work in the Intensive Care Unit (ICU), nurses encounter patients with various needs and advanced medical technology. The latest medical advancements require nurses to apply their knowledge in practice through continuous education in their field. The nurse's primary responsibility is to provide necessary care and attention to the patient, performing their duties professionally and at an appropriate level of knowledge.

The ICU provides life support for severely injured patients, ensuring continuous monitoring and treatment. The nurse's role during patient admission to the ICU involves taking medical history, checking vital signs, examining fluids and electrolytes, conducting laboratory tests, assessing neurological status, and documenting previous medications. The nurse constantly attends to the patient, providing comprehensive care and observing any changes. Intensive care involves treating patients in critical, low-risk, and non-life-threatening conditions. Indications for ICU admission include disrupted conditions, the need for mechanical ventilation, shock, acute coma, successful resuscitation, postoperative care, and transplantation.

ICU work is a team effort, with a team consisting of an anesthesiologist, nurses, clinical pharmacist, respiratory therapist, physiotherapist, dietitian, and administrative staff. Nurses and doctors stay with the patient 24/7. Nurses in the ICU must undergo additional education. Nursing is considered one of the most humane professions globally. Nurses help others maintain their greatest asset—health. They play a significant role in society, influencing positive health-related habits. To perform their duties effectively, nurses must be emotionally mature, handle human suffering, and respond adequately to ethical dilemmas and emergency situations. The demanding nature of their work leads to physical and intellectual exhaustion, commonly known as "burnout." A positive work atmosphere is crucial to quality performance and maintaining collegial relationships. Addressing burnout requires relaxation, regular exercise, and a positive mindset.

2. ORGANIZATION OF HOSPITALS AND HOSPITAL SERVICES

Hospitals are healthcare institutions providing constant medical supervision and care for patients with various health needs. The primary function is curative, involving examination, diagnosis, treatment, and strengthening the patient's immune system for recovery. Hospitals are categorized into four groups:

1. General Hospitals: These admit patients with various illnesses and can be incomplete (with specific departments) or complete, based on the range of services. The radius and bed capacity vary, typically around 150 beds for incomplete and 400-600 beds for complete general hospitals.
2. Specialized Hospitals: Exclusive for specific diseases like infectious diseases, tuberculosis, or mental health. They can be part of larger hospital centers or fully independent institutions, such as anti-tuberculosis or gynecological hospitals with 1000 beds or more.
3. Clinical Hospitals: Specialized institutions serving as teaching facilities for medical faculties, either part of a clinical center or standalone clinics.

3. ORGANIZATION OF WORK AND INTENSIVE CARE UNIT

The work in the Intensive Care Unit (ICU) involves a team approach where roles are clearly defined. The ICU team typically consists of an intensivist, specially trained ICU nurses, clinical pharmacist, respiratory therapist, physiotherapist, dietitian, social worker, and administrative staff. Consultants for infection control, quality monitoring, and cost management are also essential. Technical, energy, and IT support professionals are required, along with a department head and chief nursing officer to ensure compliance with medical standards and regulations. For patients on mechanical ventilation, one nurse cares for one patient, while stable patients may have one nurse for every two to three patients. The ICU staff focus on efficient treatment procedures, avoiding unnecessary tests, and adhering to medical and legal protocols. Professional and ethical relationships with patients, families, and colleagues are crucial.

The team model is applicable in various healthcare settings and is based on the principles that every patient deserves optimal care, and every healthcare professional has the right to work in conducive conditions. Effective communication, influence, task functions, decision-making, conflict resolution, atmosphere, and emotional issues are key elements of teamwork.

Team members should have diverse skills, shared goals, and good communication for successful collaboration. The leader plays a vital role in creating an environment where team members can combine their skills to achieve common objectives. Healthcare services are organized into teams at different levels, including department chief nursing teams, healthcare team leaders, and healthcare teams.

The team model offers advantages such as less fragmented healthcare, easier patient access to a designated contact person, a focus on patient care over tasks, a sense of community, participation of all members, affirmation of knowledge and skills, and job satisfaction for nurses. However, drawbacks include reduced efficiency, indirect information flow to the team leader, potential leadership incapacity, resistance from chief nurses, and lack of knowledge among other team members.

The main elements of teamwork include communication, influence, decision-making, conflict resolution, atmosphere, and emotional approach. The leader holds significant influence, but others may also impact the team based on their knowledge, experience, and tactics for gaining influence.

4. MEDICAL TECHNICAL PROCEDURES IN THE INTENSIVE CARE UNIT INVOLVING A NURSE

Medical nurses work in the field of health promotion, disease prevention, treatment, and rehabilitation. They are trained and authorized to observe the patient's condition, provide personal and environmental hygiene, and perform various medical and technical procedures. Nurses handle tasks such as examinations, tests, diagnostic procedures, and basic physical therapy. They also recognize emergency situations and administer professional first aid, including resuscitation, immobilization, and bleeding control.

Nurses must be emotionally mature and stable to understand and cope with human suffering, emergencies, health issues, and ethical dilemmas. They need to be caring, ready to take responsibility, work independently and collaboratively, conscientiously implement prescribed procedures, and know when to consult with others.

The electrocardiogram is a graphical record of the electrical potentials generated in the heart. It is a crucial diagnostic method in cardiology, providing valuable information about various heart conditions. The ECG records the electrical activities during depolarization and repolarization phases, represented by P-waves, QRS-complex, and T-wave. These components indicate the electrical events in the heart, offering insights into its functioning.

Electric currents generated during each heartbeat can briefly alter voltage and polarity. ECG recording equipment must rapidly detect these changes. Two common devices used are electrocardiographs with a pen and ECG registration using an oscilloscope. Monitoring the ECG helps assess frequency, rhythm, occurrence of extrasystoles, and conduction disturbances.

Nurses place electrodes at specific locations on the patient's body for ECG recording. They explain the procedure to the patient, ensuring dry skin. If the skin is hairy, it may be shaved. Electrodes are then positioned, and the patient is connected to the monitor.

5. MEASUREMENT OF CENTRAL VENOUS PRESSURE

The central venous pressure (CVP) is an important indicator for assessing the right heart function and overall circulatory volume. It is expressed in centimeters of water and measured with the patient in a horizontal position, with the zero point at the level of the heart, in the mid-axillary line. Normal CVP values range from 4-10 cmH₂O. Low CVP may indicate hypovolemia, while elevated CVP can suggest hypervolemia or myocardial weakness. Complications of monitoring include infections and air embolism, often originating from the skin and infusion. Placement in the jugular vein area poses a higher infection risk due to constant secretion near the mouth and nose. Proper care includes using aseptic techniques during insertion and maintenance, choosing the catheter

placement site carefully, and checking infusion solution integrity.

Medical care involves thorough hand hygiene, preparing supplies in advance, and using aseptic techniques. Key steps include cleaning the skin, using sterile gloves, applying sterile drapes, and securing the catheter properly. Regular checks for signs of infection, such as redness or swelling, are crucial. Catheter removal should be done aseptically, and the catheter tip should be sent for microbiological analysis.

Preventing catheter occlusion involves using infusion pumps with proper flow rates, correct heparinization, and flushing the catheter with saline solution containing heparin. Interventions should be performed without contaminating the catheter, using sterile connectors, and replacing the infusion system if contaminated. Blood sampling from the catheter requires flushing with saline after taking samples.

In summary, careful monitoring and maintenance of central venous catheters are crucial for preventing complications, and adherence to aseptic techniques is essential in providing medical care for patients with central venous catheters. Monitoring, derived from the Latin "monere," involves dynamic observation of a patient's physiological parameters. The goal is to detect, interpret, and address disturbances promptly.

General patient monitoring includes electronic devices such as pulse oximeters, capnometry, blood pressure measurement, ECG, and body temperature measurement. Specialized monitoring is used in specific diseases or surgical procedures. Respiratory monitoring focuses on breathing patterns, assessing color, frequency, depth, rhythm, and duration. Oxygenation is monitored using pulse oximetry, a non-invasive method continuously measuring oxygen saturation. Transcutaneous oximeters are used for specific cases, particularly in premature infants and small children. They are polarographic oxygen electrodes placed on the skin surface and heated.

Ventilation monitoring involves capnography and capnometry, continuously assessing carbon dioxide concentration during each respiratory cycle. Blood pressure monitoring, whether invasive or non-invasive, is crucial for assessing arterial pressure. Auscultation, using a sphygmomanometer and stethoscope, is the most accurate method for both systolic and diastolic pressure. In summary, patient monitoring is crucial for prompt detection and addressing of physiological abnormalities. Various methods, both invasive and non-invasive, are employed in different clinical settings.

4. CONCLUSION

In the intensive care unit (ICU), a high level of medical care is provided for severely ill patients, encompassing monitoring, care, treatment, and life support. ICU treatment is costly, and the incorporation of the latest technology further increases expenses. Medical nurses play a crucial role in constantly attending to patients, providing comprehensive care, and observing and noting changes in the patient's condition. Through monitoring, disruptions are observed, interpreted, and necessary measures are taken for their removal and treatment.

Respiratory function monitoring is vital in the ICU, focusing on assessing breathing patterns, color, frequency, depth, rhythm, and duration. Complex monitors are utilized to track consciousness, hemodynamics, breathing, temperature, metabolism, and various other body functions.

Education in the field of intensive care medicine is organized through numerous symposiums and congresses in Macedonia, addressing the specific focus of individual professions and annual meetings.

Medical nurses require additional training beyond high school to adequately and professionally perform their duties in the ICU. Continuous education is vital, enhancing patient safety and forming the foundation of quality healthcare. Nurses undergo education to stay updated on innovations in treatment and technology, aligning nursing procedures with standardized treatment processes.

Continuous education significantly benefits healthcare workers and patients, increasing patient safety and ensuring quality healthcare. Nurses educate and train to adapt to new treatment conditions and technologies, aligning nursing procedures with standardized treatment processes. To be successful, satisfied, and healthy, individuals need to adapt to new conditions. Through education, awareness of personal feelings, self-help, engagement in various hobbies, and minimizing exposure to prolonged stress, burnout syndrome can be minimized.

Burnout syndrome symptoms are similar to stress symptoms, characterized by emotional exhaustion and a negative attitude toward work and life. Adequate support, effective organization and distribution of work among employees, and a positive work environment reduce stress and the risk of developing burnout syndrome.

REFERENCES

- Azoulay E. (2019). Intensive Care Medicine: onwards and upwards. *Intensive care medicine*, 45(1), 106–107. <https://doi.org/10.1007/s00134-018-5503-3>
- Cañadas-De la Fuente, G. A., Albendín-García, L., de la Fuente, E. I., San Luis, C., Gómez-Urquiza, J. L., & Cañadas, G. R. (2016). Síndrome de burnout en profesionales de enfermería que realizan jornada física complementaria en servicios de cuidados críticos y urgencias [Burnout in Nursing Professionals

- Performing Overtime Workdays in Emergency and Critical Care Departments. Spain]. *Revista espanola de salud publica*, 90, e1–e9. [RS90C_GCF.pdf \(sanidad.gob.es\)](#)
- Guan, Y. X., An, Y., Guo, F. Y., Pan, W. B., & Wang, J. X. (2023). Intelligent Electrocardiogram Analysis in Medicine: Data, Methods, and Applications. *Chinese medical sciences journal = Chung-kuo i hsueh k'o hsueh tsa chih*, 38(1), 38–48. <https://doi.org/10.24920/004160>
- Hackenberger A. (2023). Intensive Care Unit Diaries: A Nurse-Led Program. *Critical care nurse*, 43(1), 20–30. <https://doi.org/10.4037/ccn2023573>
- Hodgson, C. L., Schaller, S. J., Nydahl, P., Timenetsky, K. T., & Needham, D. M. (2021). Ten strategies to optimize early mobilization and rehabilitation in intensive care. *Critical care (London, England)*, 25(1), 324. <https://doi.org/10.1186/s13054-021-03741-z>
- Kelly, F. E., Fong, K., Hirsch, N., & Nolan, J. P. (2014). Intensive care medicine is 60 years old: the history and future of the intensive care unit. *Clinical medicine (London, England)*, 14(4), 376–379. <https://doi.org/10.7861/clinmedicine.14-4-376>
- Martín Delgado, M. C., & Gordo Vidal, F. (2019). Perioperative intensive care medicine. *Medicina intensiva perioperatoria. Medicina intensiva*, 43(7), 427–434. <https://doi.org/10.1016/j.medin.2019.03.011>
- Poncette, A. S., Mosch, L., Spies, C., Schmieding, M., Schiefenhövel, F., Krampe, H., & Balzer, F. (2020). Improvements in Patient Monitoring in the Intensive Care Unit: Survey Study. *Journal of medical Internet research*, 22(6), e19091. <https://doi.org/10.2196/19091>
- Velasco Bueno, J. M., & La Calle, G. H. (2020). Humanizing Intensive Care: From Theory to Practice. *Critical care nursing clinics of North America*, 32(2), 135–147. <https://doi.org/10.1016/j.cnc.2020.02.001>
- Wei, R., Ji, H., Li, J., & Zhang, L. (2017). Active Intervention Can Decrease Burnout In Ed Nurses. *Journal of emergency nursing*, 43(2), 145–149. <https://doi.org/10.1016/j.jen.2016.07.011>