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Nursing And Healthcare Administration Roles With The Respiratory Therapist, Medicine, Anesthesia And Radiology Team In ICU Setting

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Abstract

Interprofessional rounds in the intensive care unit (ICU) facilitate scheduled meetings among diverse healthcare professionals to evaluate and analyze clinical information and formulate concise treatment plans for critically ill patients. Implementing a systematic approach to rounding enables each member of the healthcare team to focus on their specific objectives, challenges, and worries. Furthermore, they provide specialist input to the daily care plan to minimize its implications, which is crucial in the management of critically ill patients. A novel quality management (QM) effort has been introduced in an intensive care unit (ICU) to enhance the administration of radiological tests. During regular multidisciplinary conferences (MDCs), radiologists and ICU physicians conduct a thorough reassessment of recent examinations. Additionally, the objectives encompass reducing negative events, enhancing patient contentment, shortening hospital stays, and lowering mortality rates. This issue is especially arduous in critical care units, as these wards admit patients who are severely unwell, have complex medical conditions, and have the worst prognoses. By implementing interprofessional rounds and adopting a collaborative team-based approach, patient outcomes can be maximized.

Keywords: *intensive care unit (ICU), quality management (QM), multidisciplinary conferences (MDCs).*

Introduction

In the intensive care unit (ICU), the interprofessional team often consists of physicians, advanced practice providers, bedside nurses, case managers, respiratory therapists, physical therapists, occupational therapists, pharmacists, chaplains, and occasionally family members. Every team member possesses a distinct background of information, training, and technical expertise, which has the potential to enhance patient care and improve outcomes in the intensive care unit [1].

Within an interprofessional team, there are two categories of physicians: the primary physician and the consulting physician. Within an Intensive Care Unit (ICU), the role of the primary physician is fulfilled by either the intensivist or the primary attending physician, depending on the staffing arrangement of the particular institution. The consulting physicians encompass a wide range of medical and surgical specializations in healthcare. Typically, the interprofessional team is led by the primary physician who plays a key role in establishing the therapeutic approach by considering the input of the team members. Consultations are conducted by specialists who are selected based on the specific disorders being treated and the organ systems involved. Advanced practice providers offer direct assistance to physicians in their decision-making processes, with supervision from the physician in accordance with state standards [2].

The nursing team stationed at the bedside is the primary healthcare provider in an intensive care unit (ICU) environment. In hospital settings, the number of patients a nurse is responsible for directly caring for can range from 1 to 4, depending on the staffing methods and the severity of the patients' conditions. In contrast, physicians typically have a larger number of patients under their care. The patient-to-nursing staff ratio enables the nursing staff to establish a strong relationship with patients and get crucial information that can greatly influence the care objectives. This understanding is valuable because of the limited duration of a physician's interaction with patients. In addition, nurses often possess extensive understanding of the humanistic needs of patients and their families as a result of both increased interaction and training. In addition, the bedside nurse is accountable for executing numerous components of the daily plan. Tasks can include administering medication, changing dressings, providing nourishment, maintaining hygiene, performing venipuncture, and adhering to protocols. Hence, proficient communication and comprehension of the treatment plan are vital for the proper execution and fulfillment [3].

Healthcare managers and social service professionals are specifically trained to meet the psychological components of a patient's requirements. They assist in facilitating the transition to the subsequent level of care. They play a crucial role in delivering supplementary patient education regarding treatment alternatives and facilitating the coordination of diverse care requirements after being discharged. This may encompass medical apparatus and pharmaceuticals. Social workers and chaplains collaborate to coordinate assistance and bereavement therapy, as well as other psychological support services, for patients and their families [4].

A significant number of patients in an intensive care unit (ICU) necessitate pulmonary care that provides assistance. These options may involve the use of mechanical ventilator or non-invasive respiratory support. Physicians are responsible for determining the type and location of pulmonary support, while respiratory therapists are responsible for continuously monitoring and adjusting settings based on the endpoints provided by the physicians. Pharmacists aid in the process of making decisions regarding pharmacotherapy and determining the appropriate dosage. They aid in the reduction of pharmaceutical errors by identifying accurate dose and duration, ensuring effective drug monitoring, and detecting any potential medication-related interactions. Moreover, the involvement of a pharmacist in the interprofessional rounding team leads to considerable improvements in infection control management, anticoagulant medication, and the application of sedation/analgesia in ICUs [5].

Family members can also take part in daily rounds, and they are an invaluable asset. The family can provide valuable information regarding the patient's preferences, inclinations, and aversions. They have the ability to identify subtle distinctions that are unique to the individual patient. Including the family in daily rounds facilitates the exchange of information between the team and the family. The process of collaborative decision-making can enhance adherence to medical care and reduce anxiety and uncertainty around sickness and prescribed therapies [6].

Review:

The arrangement of nursing tasks (such as staffing ratios and workload) and the attributes of nurses (such as their degree of experience and educational background) have an influence on patient outcomes, the quality of care provided, and the ability to retain nurses within the profession. Nursing workers constitute around 54% of all healthcare providers and play a crucial role in ensuring patient safety and the provision of high-quality treatment. As an illustration, nurses have the duty of overseeing and supervising the stages of medication usage, which is a common and intricate interdisciplinary care procedure. It is estimated that this process leads to 1.5 million patient injuries annually [7]. Furthermore, nurses have a significant impact on patient and family advocacy, care coordination, and system enhancement. Consequently, there has been a significant focus on the significance of the work conditions for nurses. Given the projected exacerbation of the existing nursing shortage until the year 2020, it is imperative for organizations to enhance the quality of nurses' work life. In order to enhance nurses' work processes, it is essential to have a comprehensive understanding of the intricacies of nursing tasks and the pressures imposed on them by the ever-changing systems in which they operate [8].

The nurse behavioral task analysis, as described below, was part of a broader study that investigated the effects of electronic health record (EHR) installation on clinicians in different intensive care units (ICUs). The study primarily examined the impact of computerized provider order entry on various areas, including the distribution of job tasks, patient safety, and the quality of treatment [9].

Scientists have employed diverse observational techniques to record the actions of anesthesiologists, primary care physicians, pharmacists, and respiratory therapists. Various research utilized job task analysis to quantify the frequency, duration, and sequence of jobs and task categories. These studies measured the frequency of nine nurse activities in medical-surgical units at a large community hospital. Nurses allocated 25% of their time to documentation and dedicated 55% of their time to direct patient care. A prior study employed the work sampling technique to investigate the allocation of time among nurses in three hospitals. The predominant work activities for ICU nurses were direct care, accounting for 36% of their time, and communication, accounting for 25% of their time. For nurses in acute care units, the most common work activities were direct care, accounting for 29% of their time, and communication, accounting for 28% of their time. Nurses are responsible for a variety of tasks, including direct patient care as well as responsibilities like paperwork and care coordination [10].

There has been less research conducted on the work of ICU nurses. A separate study analyzed the various categories and allocation of intensive care unit (ICU) nursing responsibilities. It also contrasted the duties performed before and after the integration of an electronic information system specifically designed for ICUs. Following the adoption of an ICU information system (Quantitative Sentinel, Marquette Medical, Milwaukee, WI), the amount of time surgical ICU nurses spent on documentation decreased from 35% to 24%. The implementation of the new information system resulted in a significant increase in the proportion of time that surgical ICU nurses spent on direct care activities, such as taking vital signs and administering treatments. This percentage increased from 31% to 40%. However, the amount of time spent on indirect

care activities, such as conversing with patients and monitoring equipment, remained the same at 15% before and after the implementation. This study was conducted only in one Intensive Care Unit (ICU) in a Veterans Affairs hospital. A total of 40 hours of observation were gathered from 10 ICU nurses [11].

Integrating sophisticated informatics systems and healthcare administration into the modern intensive care unit (ICU) has the potential to significantly improve unit operations, enhance patient safety, optimize staff productivity, and enable advanced data analytics. However, establishing the ICU informatics environment is highly difficult and requires assistance from the hospital informatics administration, middleware technology vendors, and clinical stakeholders. Therefore, it is advisable to establish an ICU workgroup or committee responsible for supervising the creation, advancement, and upkeep of the "smart" ICU. This group should consist of individuals who possess expertise in the following areas: the current hospital informatics infrastructure, its interactions with the ICU, the capabilities of the informatics staff, the existing ICU bedside technologies, the middleware supported by the hospital and vendors, the data integration of the electronic medical record, and future informatics plans. Crucially, clinicians working at the bedside must be an essential part of this team. The ICU informatics team needs to have a well-defined vision for its short and long-term objectives, along with a schedule for their achievement, despite the understanding that informatics projects typically require a significant amount of time to be completed [12].

The integration of all bedside devices and middleware with the hospital's patient management systems, such as bed-board or admission, discharge, and transfer systems, is crucial for both the local and hospital envelopes. This integration enables the automatic connection of ICU systems with the ICU census. Furthermore, the ICU informatics committee must have knowledge of the FDA classification of devices and middleware, as well as any regulatory requirements that may be linked with them. Informatics solutions, particularly alarm middleware, are highly effective in managing alarms by addressing nuisance alarms and reducing alarm fatigue caused by alarm overload and noise. The alarm middleware consolidates alarm information from many sources into a single software platform, creating a central repository of alarm data that can be converted into actionable insights [13].

Alarms in the ICU are mostly produced by physiological monitors, mechanical ventilators, and infusion pumps located at the bedside. The FDA regulations strictly restrict the deactivation of certain alarms, particularly those of a catastrophic nature. Nevertheless, it is possible to adjust the alerts generated by these devices to a limited degree by modifying the configuration at the device level, including factors such as sound tone, volume, duration, and so on. In addition, there are on-board applications available for "post-processing" alarms, specifically for oxygen saturation alarms, which are the most common source of nuisance alarms [13].

The alarm middleware is employed in the ICU to enhance patient monitoring by generating specific secondary alerts. Secondary alerts refer to alarms that are sent from the device to secondary recipients who are located outside the patient room, such as the charge nurse in an ICU or a respiratory therapist who is responsible for ICU ventilated patients. Without filtering, these warnings would be raw information that would need to be communicated through nurse call systems, contributing to the excessive and unhelpful noise in the ICU. In another approach, these alarms are directed through alarm middleware that can allocate the alarms to specific individuals or groups and refine the alarms by applying time delay and/or middleware modified threshold levels to reduce the occurrence of unnecessary escalated alarms [14].

At the onset of the pandemic, the Ministry of Health, in collaboration with other governing authorities, implemented various measures to effectively address the spread of the disease and accelerate the provision of treatment. Saudi Arabia recorded its inaugural incidence of the coronavirus on March 3rd, involving a citizen who had recently traveled from Iran. By the

middle of March, schools were shut down, air travel was halted, and public gathering places like movies, malls, and religious gatherings were ceased. Additional measures were implementing a stringent curfew for all individuals, with the exception of critical workers who were needed to get a permit for travel. To expedite the detection and management of instances, the government has declared universal access to healthcare services at no cost. The objective of implementing these procedures was to decelerate the pace of escalation in the quantity of COVID-19 cases and achieve a more gradual curve of infection spread.

As previously stated, anaesthesiologists and critical care physicians have a crucial role in combating COVID-19, which has consequently heightened their risk of being exposed to the virus. A study conducted in China found that 3.5% of healthcare staff were infected with the virus. Among those infected, 14.8% experienced a severe infection. The fatality rate among this group was 0.3%, with a total of 5 deaths. By the conclusion of March, a total of 190 cases in Saudi Arabia, accounting for 12.5% of the total, were healthcare personnel. A number of nations were obliged to modify their surgical protocols and delay several elective and semi-urgent surgical interventions [16].

High flow oxygen therapy is currently extensively utilized during the perioperative period, as well as for providing support to medical and surgical patients in single system wards, and in the intensive care unit (ICU). An air-oxygen blender is utilized to administer large volumes of heated and humidified oxygen at a predetermined oxygen concentration to patients through a nasal or facial interface. The high flow rates, reaching up to 60 litres per minute, are believed to decrease the effort required for breathing and enhance the functioning of the respiratory system by delivering a modest amount of positive end expiratory pressure (PEEP) and removing stagnant gases from the airways. This combination, when used with humidification, prevents the drying of the mucous membranes, improves tolerability, and enhances the clearance of secretions. Studies have demonstrated that high flow nasal cannula (HFNC) is advantageous in treating patients with severe acute hypoxic respiratory failure, as compared to non-invasive ventilation or face mask oxygen [17].

Imaging is crucial in the diagnostic process, although its interpretation differs among individuals. Even seemingly insignificant mistakes at this point might have significant repercussions for patients. Therefore, it is imperative to optimize work procedures in order to minimize the probability of errors and detect them before they result in any harm [18]. Although organized feedback from senior to young radiologists is a regular practice in our department and many others, there has not been a specific method for interdisciplinary input between physicians and radiologists for patients in critical care units (ICUs) in the past. Patients in the intensive care unit (ICU) have intricate medical problems and necessitate care from a diverse team of healthcare professionals. This, in turn, necessitates the need for organized and systematic communication.

Prior research has examined error prevention and safety event reporting in the field of radiology. Garland, a trailblazer in the realm of diagnostic accuracy research, reported mistake rates of approximately 30% in the 1950s and 1960s. Recent investigations indicate that there has been only marginal improvement in this scenario over time [19]. These findings emphasize the significance of incorporating regular and organized feedback into clinical practice to promptly detect any diagnostic errors before patients suffer harm. This approach has only been used by a limited number of quality initiatives, as far as we know. For instance, in mammography, it is customary to do a systematic and independent second reading in order to enhance patient safety. However, the degree of statistical data supporting this rationale may differ. Additionally, numerous other research have specifically examined the caliber of radiological reports [20].

Conclusion:

Critical care is the provision of medical attention to patients who are either experiencing life-

threatening conditions or are at high risk of developing such conditions. The intensive care unit (ICU) is a separate physical area where patients receive specialized care with a focus on high staffing levels, enhanced monitoring, and organ support. These interventions aim to enhance patient outcomes by reducing both illness severity and death rates. Nevertheless, achieving optimal intensive care requires a comprehensive approach that extends beyond the confines of the critical care unit. Prevention, early warning, and response mechanisms, together with a multidisciplinary approach before and during an ICU stay, as well as complete follow-up or high-quality palliative care are necessary.

The fundamental principles of intensive care management involve optimizing a patient's physiological state, providing advanced support for organs, and identifying and treating underlying disease processes. The most effective way to accomplish this is by employing a multidisciplinary team approach, where both the admitting staff and a specialized critical care team, led by a critical care physician, share responsibility.

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