

Adopting Clinical Guidelines for Admission Criteria of Intensive Care Unit: A Measure to Manage Queues of Patients Waiting for This Section

Afshin Mohammad Alizadeh¹, Maryam Abolghazi^{2*}, Ali Dabbagh³, Bahman Malek⁴, Homeira Yazdi-Nezhad⁵

¹ Infectious and tropical disease specialist, Associate Professor of Shahid Beheshti University of Medical Sciences and Health Services, Head of Medical, Educational and Treatment Center Ayatollah Taleghani, Tehran, Iran

² Master of Health Services Management, Responsible for Hospital Committees of Medical Center, Education and Therapy of Ayatollah Taleghani, Tehran, Iran

³ Professor of Cardiac Anesthesia, Anesthesiology Research Center, Shahid Beheshti University of Medical Sciences and Health Services, Tehran, Iran.

⁴ Assistant Professor, Anesthesiology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

⁵ Anesthesiologist, Anesthesiology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Received: 15 November, 2017; Accepted: 17 February, 2018

Abstract

Background: Due to the need of patients to the intensive care unit (ICU) for receiving medical and nursing services, these services should be provided in a timely manner. This study aimed to develop the clinical guidelines for admission criteria of intensive care unit.

Materials and Methods: This study was observational type study was conducted for nine months in 2015 based on a three-step process of adoption of clinical guidelines including planning, adoption and finalization. After conducting systematic searches, the quality of retrieved clinical guidelines was evaluated by experts from policy makers in the admission of patients in the ICU. Finally, the ultimate version of the guideline was developed after reviewing and organizing expert panel sessions.

Results: The criteria for accepting patients were presented in form of seven clauses based on the neurological status, cardiovascular status, respiratory status, water and electrolyte disorders, gastrointestinal disturbances, endocrine disorders, surgery and postoperative care.

Conclusion: One of the most important factors of creating demand inducing to the patients is the lack of clinical guidelines. It is recommended that departmental doctors should apply the mentioned clinical guidelines in order to make the resources of the intensive care unit more effective.

Keywords: Clinical guidelines, Intensive care unit, Admission, Guideline adoption

***Corresponding Author:** Maryam Abolghazi, Master of Health Services Management, Responsible for Hospital Committees of Medical Center, Education and Therapy of Ayatollah Taleghani, Tehran, Iran. Tel: (+98) 9102686257 Tehran, Chamran Highway, Evin, Shahid Arabi, next to Shahid Beheshti University of Medical Sciences. Email: Pma1984@yahoo.com

Please cite this article as: Alizadeh A M, Abolghazi M, Dabbagh A, Malek B, Yazdi-Nezhad H. Adopting Clinical Guidelines for Admission Criteria of Intensive Care Unit: A Measure to Manage Queues of Patients Waiting for This Section. *Novel Biomed.* 2018;6(2):92-8.

Introduction

Intensive Care Unit (ICU) is a place in which the patients are in dire need of medical and nursing

services. If these services are not provided in a timely manner, serious problems will be occurred such as increasing mortality and disability, an increase in the average length of hospitalization and increasing the

costs¹. Although the intensive care units cover a small part of the hospital, they use the bulk of hospital costs². However, not all patients in the intensive care unit will necessarily benefit from this department, and for some will only lead to a more comfortable death³.

Studies have shown that some patients in the intensive care unit do not really need special care, they only need more frequent monitoring of vital signs or nursing care than the general population⁴.

Therefore, in order to benefit from these costly resources, the intensive care unit should be preserved for those patients who have a reversible medical condition and acceptable prospects of real recovery. Accordingly, the purpose of this study was the establishment of the clinical guidelines of admission criteria in the intensive care unit in a teaching hospital in Tehran in order to achieve an evidence-based clinical guideline based on needs, health conditions and hospital policies.

Methods

This study was observational study. In the first step, reviewing the literature was done through searching in specific websites of clinical guidelines including:

- Agency for Research and Quality of Health Care and National Guidance (www.guideline.gov)
- International Network of Clinical Guidelines (www.g-i-n.net)
- National Institutes of Health and Medical Excellence (www.nice.org.uk)
- National Association for Health and Medical Research (www.nhmrc.gov.au)
- New Zealand Clinical Guides (www.health.govt.nz)
- The Scottish Intercollegiate Guidelines Network (SIGN; www.sign.ac.uk).

The researcher performed the primary screening of clinical guidelines based on criteria such as English language, availability of the full version of the guides and their credibility. This way, he gave the following guides as valid credentials to the experts for reviewing: “The Clinical Guide of Admission Criteria and Triage in the ICU of American Association of Intensive Care⁵, Clinical Guide of Admission Criteria and Dispensing of the ICU of Minerva Anesthesiology Society⁶, Suggestions of Clinical Guide for the End of Patient Care in the ICU

of American Association of Intensive Care⁷, Admission Policy in the ICU of NHS Care Department⁸”. In order to select the most valid and at the same time the most appropriate clinical guide, the panel of experts was consisted of seven people including two anesthetists, two gastroenterologists, a hematologist and two senior healthcare management specialists.

The formal validity and content validity guideline confirmed by experts panel. Reliability was test-retest method.

For assessment of guideline components & their prepare adoption 2 indices were selected and each guideline components was assessed based on these 2 indices. They were CVI (Content Validity Index) and CVR (Content Validity Ratio).

The final version of the clinical guidelines was developed after reviewing the texts of the clinical guidelines and the comments of the panel members and considering the criteria for admission in the ICU of the educational hospital. The final version of the developed clinical guidelines was sent to the hospital headquarters in a letter for ethical considerations, designed and reviewed in Medical Ethics Committee. After approval by the Medical Ethics Committee, a clinical guide was provided by the head of the hospital to the head of the intensive care unit.

Results

The experts confirmed the formal validity of the tool. Then with the opinion of 20 experts (two groups of ten individuals including professors of anesthesia, hematology, gastroenterology and professors in the management of health services in several parts of the hospital and a number of colleagues at the university headquarters), the content validity was evaluated through calculating the CVI and CVR indices. CVR above 0.33 and CVI above 0.7 confirmed the item according to Lawshe table (9). If these indicators were not in the scope of approval, the relevant item would be reviewed once; in case of non-supply, the permitted CVI and CVR would be removed from the set of items.

Reliability of the tool was measured by the comments of those 20 experts using test-retest method. Cronbach's alpha 0.895 and the correlation coefficient 0.85 were a sign of high reliability. Spearman Brown's

internal consistency coefficient was 0.18, indicating the inner consistency of the tool.

The guidance target group were the patients admitted to the ICU of the desired hospital during the first 9 months in 2015 (639 patients) who had the priority of admission based on the criteria contained in the clinical guides. Users of the guide were the doctors of the intensive care unit.

Patients with one of the following conditions needed to be admitted to the intensive care unit (annex1 to the article)

Patients with priority 1, 2 and 3 were admitted to the intensive care unit, and patients with priority 4 were not suitable for admission due to the lack of beds in the intensive care unit:

Priority 1: Patients with hemodynamic instability requiring comprehensive treatment and monitoring, so that they cannot be performed outside of the ICU. These treatments include respiratory support, continuous infusion of vasoactive drugs, and the like. These patients do not have any limits on the extent of the treatments they should receive and need emergency hospitalization in the ICU. Examples of these patients include post-operative patients or acute respiratory failure that requires mechanical ventilation and shock.

Priority 2- These are patients with high risk of sudden and worsening situations, who require comprehensive and invasive monitoring and potentially need immediate intervention. Examples are patients with concomitant chronic diseases that are prone to acute internal illness or surgery. There are no therapeutic restrictions for this category of patients either.

Priority 3- This category includes instable patients who are very sick and have little chance of recovery due to the underlying illness or the nature of their acute illness. These patients may receive extensive treatments for their acute illness, but therapeutic efforts will come with a few results. Examples of these patients include those with metastatic malignancies that are infected, such as cardiac tamponade or airway obstruction.

Priority 4 - These patients are not normally eligible for admission to the ICU. Examples of these patients include patients with irreversible illness and the last stage of death such as sever irreversible brain

injuries, Irreversible multi-organ failure, metastatic cancers that did not respond to chemotherapy or radiotherapy (except for patients who are on a specific treatment protocol), patients who can decide to attend in the ICU and do not accept it, patients with cerebral dysfunction that are not donors, vegetative patients and patients who are permanently unconscious.

Admission of these patients should be based on an individual condition, under unconventional conditions and under the supervision of the supervisor of the ICU. The status of patients admitted to the care unit should be reviewed continuously and the patients who need ICU no more should be determined.

In the two following conditions, the patient can be discharged from the ICU:

- 1) When the physiological condition of the patients has stabilized and there is no more need for monitoring and care of the ICU.
- 2) When the physiological state of patients has worsened and there is no more planning for active interventions, (examples of these patients are similar to those with priority 4 in the intensive care unit).

Discussion

Studies reported that the highest mortality rate in the ICU was in the first-fourth days and the lowest mortality rate had been occurred two weeks after hospitalization¹⁰. This indicates that all diagnostic treatments in the ICU should be provided in the first days for patients. Therefore, the necessity of receiving timely and appropriate services for these patients emphasizes the need for sufficient beds for the ICU and suitable equipment and qualified personnel.

It should be noted that both long-term and short-term and unnecessary hospitalization in the ICU is costly; it is like a burden on patients and their families, which also affects the society and health system in a broader view¹¹.

Unfortunately, the indication of admission to the ICU has been defined much general and it is difficult to recognize whether a patient will really benefit from special cares. This has led to inappropriate and non-optimal use of equipment and beds in the ICU¹².

Since direct use of the best evidences in terms of care in this research is a time-consuming and difficult process for health workers, the clinical practice guides are applied as a facilitating tool for this purpose¹³.

Evidence-Based Clinical Practice Guides include suggestions and recommendations that are formulated in a systematic way. They help decision-makers in terms of care and patients for appropriate health care in specific clinical situations¹⁴.

Clinical practice guides are developed and applied as an essential tool for improving the quality of health care, promoting the outcomes of the disease, decreasing diversity in clinical performance, reducing costs and measuring the staff performance^{15,16}.

Compilation of clinical guidelines is a complicated process and time consuming and requires many resources. For this reason, it is recommended that the process of adaptation be conducted in developing countries in order to achieve adaptation clinical guidelines¹⁵.

The adaptation process of guidelines is a systematic approach for converting the produced guides in specific cultural contexts into usable guides in other environments and conditions. This makes the guides suitable for specific situations of a country, region and hospital¹⁷. The adaptation of existing clinical guidelines can prevent reworking, save resources and increase the efficiency of guides^{17,18}.

The research results and, consequently, the organizations suggest the use of clinical guides in this process^{19,20}. For the patients who need to receive the ICU services, it is very essential that these services be provided timely with appropriate quality. Because these patients are in a critical condition and if these services are not provided in a timely manner, the likelihood of death, disease defects and complications will be raised in them. Thus, it is essential to distinguish the patients who do not need special care from truly needed patients. This leads to plan for services that are more suitable and assessment of the way resources of the intensive care unit are used and designing strategies for grading care services in the ICU with the lowest cost²¹.

Considering that some performance indicators such as the bed occupancy rate of the intensive care unit of the hospital under study in the 9 months of the year 2015 were 96.8%, the average length of stay of patients was obtained more than four days. Having reviewed the medical records of patients, some of patients admitted to the ICU of the hospital were not

eligible for the hospitalization. There were patients with irreversible disease and late stage that care and accommodation in the ICU do not improve their disease.

This study demonstrated that admission criteria of Intensive Care Unit is a document with the aim of guiding decisions and criteria regarding diagnosis, management, and treatment in specific areas of healthcare.

Considering that one of the most important factors in inducing demand and imposition of unnecessary services to patients is the lack of clinical guidelines, it is suggested that departmental doctors use the mentioned clinical guideline continually in order to make the resources of intensive care unit more effective.

Excessive cost of maintaining a patient in the ICU requires patients to be transferred to other specialized departments when they are unwilling to receive treatment in this unit. Ideally, only the patients should be hospitalized in the ICU who has benefited the most from the ICU. The patients who are very good or dying are not candidates of admission in the intensive care unit.

It seems that with the implementation of the clinical guidelines, increasing available beds, increasing elective surgery with a shorter waiting time, better use of physicians and nurses and, generally, the performance indicators of the ICU will be improved. Grando et al. in their study on determining a goal-oriented framework for clinical guidelines and handling medical errors showed that clinical guidelines help doctors and patients to make decisions and prepare themselves to do the best of the treatment process. It would be possible to prevent errors that occur in abnormal or unpredictable conditions by creating a framework for clinical guidelines. The admission would be done based on the indication and increase the income of health centers²².

Rashidian and Yan studied on developing a model for the application of clinical guidelines in clinical services and their effects on the methods of prescribing drugs by general practitioners. They provided a simple model for guiding the providers of clinical services and general practitioners in the application of clinical guidelines. This model is summarized in six steps: choosing a clinical problem,

selecting clinical guidance, identifying the influential people, detecting organizational variables, planning and implementing a specific strategy for applying the clinical guidelines and reviewing the results of applying clinical guidelines. This model was a good framework for planning clinical guidelines and identifying the barriers of the application path. It also explains some of the causes that make a difference in the use of various clinical guidelines²³.

Studies conducted on the obstacles to the use of clinical guidelines of organizational constraints and lack of knowledge have identified the guidance recommendations as environmental factors and the ambiguity in the recommendations as a factor related to clinical guidelines. Therefore, it seems that the support of policy makers and health workers and training the health system staff towards familiarity with evidence-based performance and the importance of its' application is an essential step for the implementation of clinical guidelines and then eliminating knowledge breaks and improving the quality of services.

Conclusion

This clinical practice guideline developed based on evidence can guide admission criteria of ICU a process in clinical practice. Criteria were adopted that define patients who are optimal candidates for management in an intensive care unit. These recommendations provide a comprehensive framework to guide practitioners in making informed decisions during the admission process as well as in resolving issues of non-beneficial treatment and rationing.

Acknowledgment

Thanks for the leadership, hospital management, physicians and nursing staff at the intensive care unit, who worked together to develop a clinical guide.

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Annex1: Clinical Guidelines for Admission Criteria of Intensive Care Unit.

Neurologic Conditions:

- 1- Acute change in mental status that is perceived as life-threatening
- 2- Coma: metabolic, toxic, or anoxic
- 3- CNS(Central Nervous System)
- 4- Status epilepticus
- 5- Acute stroke with altered mental status
- 6- Brain dead or potentially brain dead patients

Cardiovascular:

- 1- Dissecting aortic aneurysms
- 2- Acute congestive heart failure with respiratory failure and/or requiring hemodynamic support
- 3- Hypertensive emergencies
- 4- Cardiac tamponade or constriction with hemodynamic instability
- 5- S/P cardiac arrest
- 6- Arterial occlusion with limb ischemia at rest

Pulmonary System:

- 1- Acute respiratory failure requiring ventilator support
- 2- Chronic Obstructive Pulmonary Disease
- 3- Massive hemoptysis
- 4- Respiratory failure with imminent intubation
- 5- The need for respiratory nursing care that is not available in all wards
- 6- Patients admitted to the hematology, oncology and digestive departments where their respiratory state has worse

Fluid and Electrolyte Disorders:

- 1- Hypovolemia with hemodynamic instability
- 2- Life-threatening electrolyte and acid-base abnormalities
- 3- Acute renal failure with potential need for dialysis
- 4- Any condition that requires hemofiltration or emergent hemodialysis

Gastro intestinal Disorders:

- 1- Life threatening gastrointestinal bleeding including hypotension, angina, continued bleeding, or with comorbid conditions
- 2- Fulminant hepatic failure
- 3- Severe pancreatitis
- 4- Esophageal perforation with or without mediastinitis
- 5- Severe Sepsis
- 6- IBD(Inflammatory bowel disease)

Endocrine Disorder:

- 1- Diabetic ketoacidosis complicated by hemodynamic instability, altered mental status, respiratory insufficiency, or severe acidosis.
 - 2- Thyroid storm or myxedema coma with hemodynamic instability
 - 3- Hyperosmolar state with coma and/or hemodynamic instability
 - 4- Adrenal crises with hemodynamic instability
 - 5- Severe hypercalcemia with altered mental status, requiring hemodynamic monitoring
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- 6- Hypo or hypernatremia with seizures, altered mental status
 - 7- Hypo or hypermagnesemia with hemodynamic compromise or dysrhythmias
 - 8- Hypo or hyperkalemia with dysrhythmias or muscular weakness
 - 9- Hypophosphatemia with muscular weakness
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Vital Sign:

- 1- HR is less than 40 / min or more than 150 / min
 - 2- Arterial systolic pressure is less than 80 mmHg or 30 mmHg less than the patient's usual pressure
 - 3- Median arterial pressure is less than 60mmHg
 - 4- arterial diastolic pressure greater than 120 mmHg
 - 5- Respiratory rate (RR) greater than 35 breaths per minute
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Laboratory values:

- 1- Serum Na ≤ 120 meq/L or ≥ 160 meq/L
 - 2- Serum K ≤ 2.5 meq/L or ≥ 6.5 meq/L
 - 3- PaO₂ ≤ 50 mmHg
 - 4- PH > 7.7 & PH ≤ 7.20
 - 5- Serum glucose ≥ 600 mg/dL
 - 6- Serum calcium ≥ 15 mg/dL
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