

Guidelines for ICU Admission, Discharge, and Triage



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These guidelines can also be found in the March 1999 issue of *Critical Care Medicine* --
Crit Care Med 1999 Mar; 27(3):633-638

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ABSTRACT

Appropriate utilization of Intensive Care Unit (ICU) resources is an important issue as the nation struggles to contain health care expenditures. The guidelines proposed here provide models which ICUs may use in formulating admission, discharge and triage criteria. A process for implementation, monitoring and performance review of policies and procedures is also included.

INTRODUCTION

The ICU concept prevalent today proliferated in the 60's (1-3). The first Consensus Conference on Critical Care Medicine led by the National Institutes of Health (NIH) in 1983 pointed out that clinical practice has led to expanded indications for admissions to critical care units (4). Most physicians are of the opinion that the benefits of ICU care are unmeasured rather than uncertain (5). Because of the utilization of expensive resources, ICUs should, in general, be reserved for those patients with reversible medical conditions who have a "reasonable prospect of substantial recovery" (4-6). With recent changes in the health care environment, efficient use of ICUs has become a priority. Unfortunately, few studies have examined the indications for and the outcome of ICU care (7-10). Those that have, suggest that we may not be categorizing patients accurately. For example, Kraiss, et al. evaluated 196 patients undergoing carotid endarterectomy over a two-year period. There was no difference in outcome or complications between the group admitted to intensive care and those admitted to a general ward (8).

The Ethics Committee of the Society of Critical Care Medicine has previously published a consensus statement on triage (11). Guidelines for developing admission and discharge criteria were also proposed (12). The current document is a compilation and revision of the previously published guidelines.

Individual ICUs, using the guidelines presented below, should create policies specific to their unit. Criteria for ICU admission and discharge should be explicitly described. In addition, each ICU should define the scope of services it provides, and the patient population it serves, as approved by the professional staff. Specific circumstances under which the patients are admitted should also be defined (12-14). Guidelines and implementation policy should be written by a multiprofessional team. While the composition of the ICU Committee may vary, it should assure an adequate voice for those who regularly provide service to ICU patients, including respiratory care practitioners, nurses, physicians, and social workers.

The ICU Committee should review the policies of the intensive and intermediate care units. The Committee should also help educate the staff on admission/discharge/triage criteria, and efficient resource consumption.

Policies written for admission, discharge, and triage should be reviewed on a regular basis and revised as needed. Revisions should be based on objective data. Compliance with the policy should be monitored in an appropriate forum, which in most institutions would be the ICU Committee. A policy should be in place for accommodating admissions when unit capacity is reached. Options may include limiting elective surgery or re-routing critical care admissions from the emergency department. Increasing the functional capacity of the ICU by boarding patients in other advanced care areas (assuming appropriate personnel and technological resources are available) may be an alternative to limiting services.

The admission, discharge, and triage criteria should also recognize patient autonomy, including advance directives, living wills, or durable powers of attorney for health care decisions. It also should indicate who can admit patients to the ICU. Specific credentialing procedures should be in place.

Levels of Recommendations for the Intensive Care Unit

The Intensive Care Unit serves as a place for monitoring and care of patients with potentially severe physiological instability requiring technical and/or artificial life support. The level of care in an ICU is greater than that available on the floor or Intermediate Care Unit.

Rating System

Level 1: Convincingly justifiable on scientific evidence alone

Level 2: Reasonably justifiable by available scientific evidence and strongly supported by expert critical care opinion

Level 3: Adequate scientific evidence is lacking but widely supported by available data and critical care expert opinion

1. (Level 3) The Intensive Care Unit should have designated medical and nursing directors who are responsible for assuring appropriate patient triage through enforcement of patient admission and discharge criteria. This triage must consider the needs of the patient and institution.
2. (Level 3) The physician and nurse directors should determine the limits of care, telemetry, mechanical ventilation and types of intravenous medications.
3. (Level 3) Intensive Care Unit Committee - A multiprofessional committee should be involved in developing and implementing the admission and discharge criteria.
4. (Level 2) The provision of intensive care improves the outcome of critically ill patients.
5. (Level 2) An intensivist-led multiprofessional team improves the outcomes of critically ill patients as measured by mortality, length of stay, and resource consumption. (15, 16)

ADMISSION CRITERIA

ICU admission criteria should select patients who are likely to benefit from ICU care (2). Griner identified two conditions in which ICU care was of no greater benefit than conventional care (10). Situations involved patients who were at the two extremes of the risk of death spectrum; relatively low risk of death and exceedingly high risk of death. These groups can be referred to as "too well to benefit" and "too sick to benefit" from critical care services. ICU care has been demonstrated to improve outcome in severely ill, unstable patient populations (17, 18). Defining the "too well to benefit" and "too sick to benefit" population may be difficult solely based on diagnosis (7, 19-24). For example, drug overdose patients are commonly admitted to an ICU. However, Brett et al. (19), demonstrated that patients without clinically determined high risk criteria never required ICU interventions. Nonetheless, 70% of these low risk patients were admitted to an ICU for observation.

In addition to difficulties in determining the patient population who are too well or too sick to benefit, the specific criteria defining "substantial benefit" are subject to interpretation. For example, Paz, et al, examined admissions to the medical ICU following bone marrow transplantation. Bone marrow transplantation patients undergoing

mechanical ventilation had an ICU discharge rate of only 3.8% compared to a discharge rate of 81.3% for those patients not requiring this therapy (21). Previous published reports documented similar poor survival rates for ventilator-requiring bone marrow transplantation patients (2.5% to 7.0%) (22-24). Whether a 2.5% to 7% discharge rate of bone marrow transplantation patients requiring mechanical ventilation is substantial or not may depend on the institution. These interpretations will lead to differences in admission criteria between institutions and physicians.

Thus, it is recommended that ICU practitioners understand tools for assessing severity of illness and prognosis of critically ill patients. These instruments in conjunction with clinical judgement represent the best tools currently available to determine prognosis (11, 25-27). **It should be noted, however, that in general, these predictive instruments have only been applied to patients already admitted to an ICU and have not been tested as preadmission screening tools.**

The ICU admission decision may be based on several models utilizing prioritization, diagnosis, and objective parameters models. **We wish to emphasize that these models are presented as guidelines and individual institutions must create specific criteria to meet their special requirements.**

Prioritization Model

This system defines those that will benefit most from the ICU (Priority 1) to those that will not benefit at all (Priority 4) from ICU admission.

Priority 1: These are critically ill, unstable patients in need of intensive treatment and monitoring that cannot be provided outside of the ICU. Usually, these treatments include ventilator support, continuous vasoactive drug infusions, etc. Priority 1 patients generally have no limits placed on the extent of therapy they are to receive. Examples of these patients may include post-operative or acute respiratory failure patients requiring mechanical ventilatory support and shock or hemodynamically unstable patients receiving invasive monitoring and/or vasoactive drugs.

Priority 2: These patients require intensive monitoring and may potentially need immediate intervention. No therapeutic limits are generally stipulated for these patients. Examples include patients with chronic comorbid conditions who develop acute severe medical or surgical illness.

Priority 3: These unstable patients are critically ill but have a reduced likelihood of recovery because of underlying disease or nature of their acute illness. Priority 3 patients may receive intensive treatment to relieve acute illness but limits on therapeutic efforts may be set such as no intubation or cardiopulmonary resuscitation. Examples include patients with metastatic malignancy complicated by infection, cardiac tamponade, or airway obstruction.

Priority 4: These are patients who are generally not appropriate for ICU admission. Admission of these patients should be on an individual basis, under unusual circumstances and at the discretion of the ICU Director. These patients can be placed in the following categories:

- A. Little or no anticipated benefit from ICU care based on low risk of active intervention that could not safely be administered in a non-ICU setting (too well to benefit from ICU care). Examples include patients with peripheral vascular surgery, hemodynamically stable diabetic ketoacidosis, mild congestive heart failure, conscious drug overdose, etc.
- B. Patients with terminal and irreversible illness facing imminent death (too sick to benefit from ICU care). For example: severe irreversible brain damage, irreversible multi-organ system failure, metastatic cancer unresponsive to chemotherapy and/or radiation therapy (unless the patient is on a specific treatment protocol), patients with decision-making capacity who decline intensive care and/or invasive monitoring and who receive comfort care only, brain dead non-organ donors, patients in a persistent vegetative state, patients who are permanently unconscious, etc.

Diagnosis Model

This model uses specific conditions or diseases to determine appropriateness of ICU admission.

A. Cardiac System

1. Acute myocardial infarction with complications
2. Cardiogenic shock
3. Complex arrhythmias requiring close monitoring and intervention
4. Acute congestive heart failure with respiratory failure and/or requiring hemodynamic support
5. Hypertensive emergencies
6. Unstable angina, particularly with dysrhythmias, hemodynamic instability, or persistent chest pain
7. S/P cardiac arrest
8. Cardiac tamponade or constriction with hemodynamic instability
9. Dissecting aortic aneurysms
10. Complete heart block

B. Pulmonary System

1. Acute respiratory failure requiring ventilatory support
2. Pulmonary emboli with hemodynamic instability
3. Patients in an intermediate care unit who are demonstrating respiratory deterioration
4. Need for nursing/respiratory care not available in lesser care areas such as floor or intermediate care unit
5. Massive hemoptysis
6. Respiratory failure with imminent intubation

C. Neurologic Disorders

1. Acute stroke with altered mental status
2. Coma: metabolic, toxic, or anoxic
3. Intracranial hemorrhage with potential for herniation
4. Acute subarachnoid hemorrhage
5. Meningitis with altered mental status or respiratory compromise
6. Central nervous system or neuromuscular disorders with deteriorating neurologic or pulmonary function
7. Status epilepticus
8. Brain dead or potentially brain dead patients who are being aggressively managed while determining organ donation status
9. Vasospasm
10. Severe head injured patients

D. Drug Ingestion and Drug Overdose

1. Hemodynamically unstable drug ingestion
2. Drug ingestion with significantly altered mental status with inadequate airway protection
3. Seizures following drug ingestion

E. Gastrointestinal 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

F. Endocrine

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. Other endocrine problems such as adrenal crises with hemodynamic instability
5. Severe hypercalcemia with altered mental status, requiring hemodynamic monitoring
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

G. Surgical

1. Post-operative patients requiring hemodynamic monitoring/ventilatory support or extensive nursing care

H. Miscellaneous

1. Septic shock with hemodynamic instability
2. Hemodynamic monitoring
3. Clinical conditions requiring ICU level nursing care
4. Environmental injuries (lightning, near drowning, hypo/hyperthermia)
5. New/experimental therapies with potential for complications

Objective Parameters Model

Objective criteria have been requested, expected and reviewed from individual hospitals as part of the Joint Commission on Accreditation of Healthcare Organizations' review process of special care units in the past. While the review process has recently been changed (13), it is understandable that hospitals would continue to incorporate objective parameters as part of the admitting criteria. **The criteria listed, while arrived at by consensus, are by necessity arbitrary.** They may be modified based on local circumstances. Data demonstrating improved outcome using specific criteria levels are not available.

Vital Signs

- * Pulse < 40 or > 150 beats/minute
- * Systolic arterial pressure < 80 mm Hg or 20 mm Hg below the patient's usual pressure
- * Mean arterial pressure < 60 mm Hg
- * Diastolic arterial pressure > 120 mm Hg
- * Respiratory rate > 35 breaths/minute

Laboratory Values (newly discovered)

- * Serum sodium < 110 mEq/L or > 170 mEq/L
- * Serum potassium < 2.0 mEq/L or > 7.0 mEq/L
- * PaO₂ < 50 mm Hg
- * pH < 7.1 or > 7.7
- * Serum glucose > 800 mg/dl
- * Serum calcium > 15 mg/dl
- * Toxic level of drug or other chemical substance in a hemodynamically or neurologically compromised patient

Radiography/Ultrasonography/Tomography (newly discovered)

- * Cerebral vascular hemorrhage, contusion or subarachnoid hemorrhage with altered mental status or focal neurological signs
- * Ruptured viscera, bladder, liver, esophageal varices or uterus with hemodynamic instability
- * Dissecting aortic aneurysm

Electrocardiogram

- * Myocardial infarction with complex arrhythmias, hemodynamic instability or congestive heart failure
- * Sustained ventricular tachycardia or ventricular fibrillation
- * Complete heart block with hemodynamic instability

Physical Findings (acute onset)

- * Unequal pupils in an unconscious patient
- * Burns covering > 10% BSA
- * Anuria
- * Airway obstruction
- * Coma
- * Continuous seizures
- * Cyanosis
- * Cardiac tamponade

DISCHARGE CRITERIA

The status of patients admitted to an ICU should be revised continuously to identify patients who may no longer need ICU care.

- A. When a patient's physiologic status has stabilized and the need for ICU monitoring and care is no longer necessary
- B. When a patient's physiological status has deteriorated and active interventions are no longer planned, discharge to a lower level of care is appropriate

Discharge criteria from Critical Care Units should be similar to the admitting criteria for the next level of care such as intermediate care where available. However, not all patients require intermediate care after ICU discharge.

TRIAGE

Under ideal conditions patients would be admitted or discharged strictly on their potential to benefit from ICU care. Unfortunately, in many instances the number of potential ICU patients exceeds the available beds. A method of prioritizing or triaging patients is necessary (11, 29). Initial triage of patients may follow the guidelines given in the prioritization model for admissions. In an environment where ICU admissions are rigorously screened for benefit, and discharge is ongoing and continuous, the need for triage is minimized.

When all ICUs and step-down units are filled, the ICU/Critical Care Director should have access to all of these units and have the responsibility and authority to admit/discharge patients from these units. Triage policies for an institution should be written in advance. Triage decisions should be made explicitly, and without bias. Ethnic origin, race, sex, social status, sexual preference or financial status should never be considered in triage decisions. Triage decisions may be made without patient or surrogate consent, and can be made despite an anticipated untoward outcome. Religious or moral convictions may be the basis for providing treatment "if the costs are not borne by the general society and the provision of such services does not foreclose the treatment of other patients who

would benefit from critical care" (30). The topic of triage of critically ill patients has been recently reviewed by the Society of Critical Care Medicine Ethics Committee (11). The reader is referred to this document for a more in-depth discussion of this topic.

PERFORMANCE REVIEW

The performance evaluation and review of an ICU should include its admission/discharge/triage policy. A multiprofessional team should review performance at least annually. In order to adequately review performance as it relates to admission, outcome, and the decision-making process, a database able to track these and other variables would be extremely useful. Severity adjusted outcomes should be utilized whenever possible in order to minimize the effect of severity of illness on raw mortality data, independent of policy or care standards. As guidelines to limit these types of admissions are instituted, care must be taken to track the patients sent to other areas to assure equivalency of outcome, length of stay, etc. A mechanism to review requested admissions that were denied should be in place to assure appropriateness of both the policy and the decision-making process. Conflicts over discharges should be reviewed so that possible improvements in the discharge policy can be identified and incorporated. Readmissions to the ICU for a similar problem should be monitored closely as they may directly relate to the quality of the discharge process (31-33). The quality and efficiency of an ICU should be continually examined and improved through this process. Studies examining objective criteria for admission and benefit of admission to ICUs should be encouraged in order to better define appropriate utilization of this important and expensive resource.

Administrative Recommendations to Facilitate Appropriate Admissions, Discharges and Delivery of Intensive Care Units

A. Personnel

1. A Physician Director must be appointed who, on the basis of training, interest, type of practice, and availability can give clinical, administrative and educational direction to the Intensive Care Unit. The Physician Director should meet "Guidelines for the definition of an intensivist and the practice of critical care medicine" published by the Society of Critical Care Medicine (34). Collaboration with nursing and ancillary staff should be emphasized. The Director should assume responsibility for assuring the quality, safety, and appropriateness of care in the Intensive Care Unit. The Director must work collaboratively with the Directors of other areas in the institution so that patient care, triage, and patient flow are effective and efficient.

The ultimate authority for ICU admission, discharge, and triage rests with the ICU Director.

2. An ICU Director has the responsibility to ensure that the patients meet ICU admission and discharge criteria. Formal recognition of the role of the ICU Director should occur through established hospital pathways. A knowledge of the various prognostic models is required of the ICU Director (11). A clearly written procedure for conflict resolution as it relates to admission and discharge of patients must be in place.
3. The multiprofessional team of professionals should meet on a regular basis to identify and solve problems through quality assurance and continuous quality improvement activities.

SUMMARY

The Intensive Care Unit can provide efficient and effective care to the critically ill patients by implementing well thought out admission, discharge, and triage policies and procedures.

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These guidelines, originally published by the Society of Critical Care Medicine in 1988 and last revised and published in 1993, have been revised by a Task Force of the American College of Critical Care Medicine of the Society of Critical Care Medicine, and thereafter reviewed by the Society's Council. These guidelines reflect the official opinion of the Society of Critical Care Medicine and should not be construed to reflect the views of the specialty boards or any other professional medical organization.

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Approved by the Council of the Society of Critical Care Medicine in May 1998. To be revised in 2002.