

Compliance of Guidelines for Intensive Care Unit Admissions in San Juan City Hospital in a Three Months Period

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Abstract

Purpose: To measure the degree of compliance of national guidelines for admission to the Intensive Care Unit (ICU) at San Juan City Hospital (SJCH).

Design: This was a prospective observational cohort study at an urban academic hospital. We revised prospectively for three consecutive months all the patients admitted to ICU and then compare the admission criteria used with the national guidelines for ICU admission.

Patients and participants: We included all patients who were admitted to ICU from September 1st to November 30th, 2006, for a total of 125 patients.

Interventions: Data collection from the medical record at the time of admission to ICU.

Measurements and results: A total of 125 patients were admitted to ICU during the three months period of the

study. Of these 58% were in compliance with national guidelines. The pulmonary system criteria was the most numerous admission criteria with 41.9% followed by the cardiac system criteria with 25.7% and gastrointestinal system criteria with 13.5%. Regarding the objective parameters model criteria the vital signs and laboratory values was the most frequent with 35.7% followed by electrocardiogram parameters criteria with 21.4% and physical findings criteria with 7.1%.

Conclusions: Our findings revealed that, in general, admissions at SJCH are done accordingly to national guidelines. But a 42% of admissions without criteria is a very high number of admissions which signified a wrong utilization of expensive resources. This finding correlates with the deficiencies in admission criteria knowledge among medical admission officers.

Key words: Intensive Care Unit (ICU), admission guidelines, diagnosis model criteria, objective parameters model criteria, San Juan City Hospital (SJCH)

Introduction

Clinical practice has led to expanded indications for admission to critical care units, (1) which implies the utilization of expensive resources compared to admissions

to an internal medicine ward. (2) Because of this, Intensive Care Units (ICU) should be reserved for patients with reversible medical conditions (1,3,4) which require these resources for their management. Unfortunately, few studies have examined the indications for ICU admissions. (5-8)

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The Ethics Committee of the Society of Critical Care Medicine published a consensus statement on triage, (9) and guidelines for developing admission and discharge criteria to ICU. (10) Every hospital should have their own guidelines for admission to ICU based on objective data,

and they should review and modify as needed on a regular basis (see **Recommendations**).

Patients admitted to ICU should be likely to benefit from it. (11) Griner identified two conditions which would not benefit from ICU, (8) these were patients with low risk of death and those exceedingly high risks of death. These groups are also called “too well or too sick to benefit” from ICU. Defining the “too well or too sick” patients may be difficult (5,12-17) since ICU has demonstrated to improve outcomes in severely ill, unstable patients (18,19).

Materials and methods

We evaluated all the patients admitted to ICU and Coronary Critical Unit (CCU) at the San Juan City Hospital (SJCH) from September 1st to November 30th, 2006. The total of patients was 125.

To collect the data we revised the medical records of all the patients at the moment of admission or transfer to ICU, and evaluated the diagnosis, laboratories, electrocardiograms, imaging studies, vital signs, and the necessity for hemodynamic monitoring.

All the data was collected and processed in the computer using the Excel program.

All the internal medicine residents, which are also the admitting officers, were surveyed (see **Appendix**) to evaluate their knowledge about the admission criteria to ICU and CCU. This helps us identify the admission criteria knowledge of the admission official to the degree of compliance to national guidelines at ICU.

Discussion

A total of 16 residents, 8 PGY 1, 5 PGY 2, and 3 PGY 3, participated in the survey. One of them scored 65%, three scored 60%, and the rest scored 55% or less. 100% of the residents did not know that there are national guidelines for admission to ICU, 68% of residents did not know there are guidelines in our hospital for admission to ICU. As an example of the lack of knowledge by our admitting staff

of the criteria for admission to ICU, thirteen out of sixteen answered that every patient with myocardial infarction with no evidence of complications should always be admitted to ICU or CCU at least 24 hours, which, according to the Society of Critical Care Medicine, is not necessary. (10) A similar percent repeated a wrongful answer in other similar questions about cardiovascular diseases.

125 patients were included in our research, 56.8% were male and 43.2% female (**Figure 1**), with ages between 19 and 90 years, average 54 year-old (**Figure 1**). Admission to ICU was less frequent in both extremes of the spectrum of age, and in these cases female gender predominated considerably.

The most frequent diagnosis for admission was acute coronary syndrome with 29.6% of patients, followed by acute respiratory failure with mechanical ventilation with 13.6%, and upper gastrointestinal bleeding with 9.6%. Those three pathologies represent the 52.8% (**Figure 2**) of all admitted cases and the rest 47.2% correspond to twenty-three other diagnosis.

Figure 3 shows that of the 125 patients, 58% had criteria for admission to ICU, and 42% did not have admission criteria according to the national guidelines. The most frequent admission diagnosis of the patients admitted without criteria were acute coronary syndrome with 36.5%, acute renal failure with 9.6%, upper gastrointestinal bleeding with 9.6%, and congestive heart failure with 9.6%. Those diagnoses represent a 65.3% of the cohort with the remaining 34.7% of the cases distributed in other twelve diagnoses (**Figure 4**).

Figure 5 shows the distribution of primary diagnosis in admitted patients with ICU criteria which illustrate that the most frequent are acute coronary syndrome (24.7%), acute respiratory failure in mechanical ventilation (23.3%), upper gastrointestinal bleeding (9.6%), and pneumonia (9.6%) for a 67.2% and the remaining 32.8% distributed in fourteen others diagnosis.

There are two models of admission criteria established by the national guidelines. **Figure 6** corresponds to the distribution of the Diagnostic Model Criteria among the admitted patients with criteria which show that pulmonary system criteria was

the most numerous with a 41.9% followed by cardiac system criteria (25.7%), gastrointestinal system criteria (13.5%), miscellaneous criteria (9.5%), neurology system criteria (6.8%), endocrine system criteria (1.4%), and surgical criteria (1.4%). **Figure 7** display the distribution of the pulmonary system criteria, which reveal that 94% correspond to the criteria of acute respiratory failure in mechanical ventilation leaving the imminent intubation and need for nursing and respiratory care 3.4% each. Among the acute respiratory failure in mechanical ventilation pulmonary system criteria, the most frequent primary admission diagnosis of these patients were pneumonia (45%), cerebrovascular accident (14%), sepsis (7%) and organophosphate intoxication (7%) with the remaining 27% corresponding to 8 others diagnosis as shown in **Figure 8**.

Figure 9 corresponds to the Objective Parameters Model Criteria Distribution, which illustrate that vital signs and

laboratory values were the most frequent parameters criteria with 35.7% each followed by electrocardiogram parameters criteria (21.4%) and physical findings (7.1%). Among the vital signs, the respiratory rate and pulse parameters criteria were the most frequent with 40% each followed by diastolic blood pressure parameters with 20% (**Figure 10**). The admission diagnosis that corresponds to this vital signs parameters criteria were non ST elevation MI and pneumonia with 40% each and beta blocker intoxication with 20% (**Figure 11**). **Figure 12** points up the distribution among the laboratory parameters criteria which demonstrate that the arterial oxygen partial pressure is the leading parameter with 40% followed by serum glucose, serum potassium, and serum sodium level with 20% each. The primary diagnosis of the patients with those parameters criteria were symptomatic hyponatremia, hypokalemia, hyperosmolar state, pneumonia, and ischemic cerebrovascular accident with 20% each (**Figure 13**).

Figure 1. Age and Gender Distribution

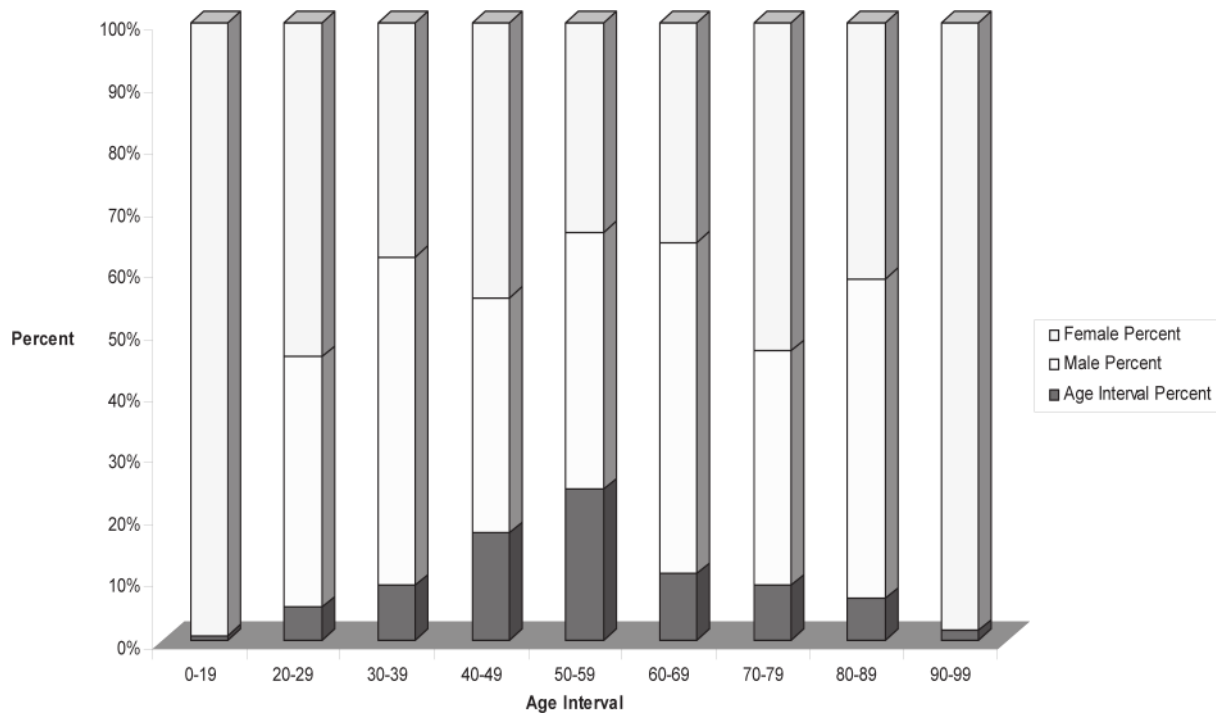


Figure 2. Admission Primary Diagnosis

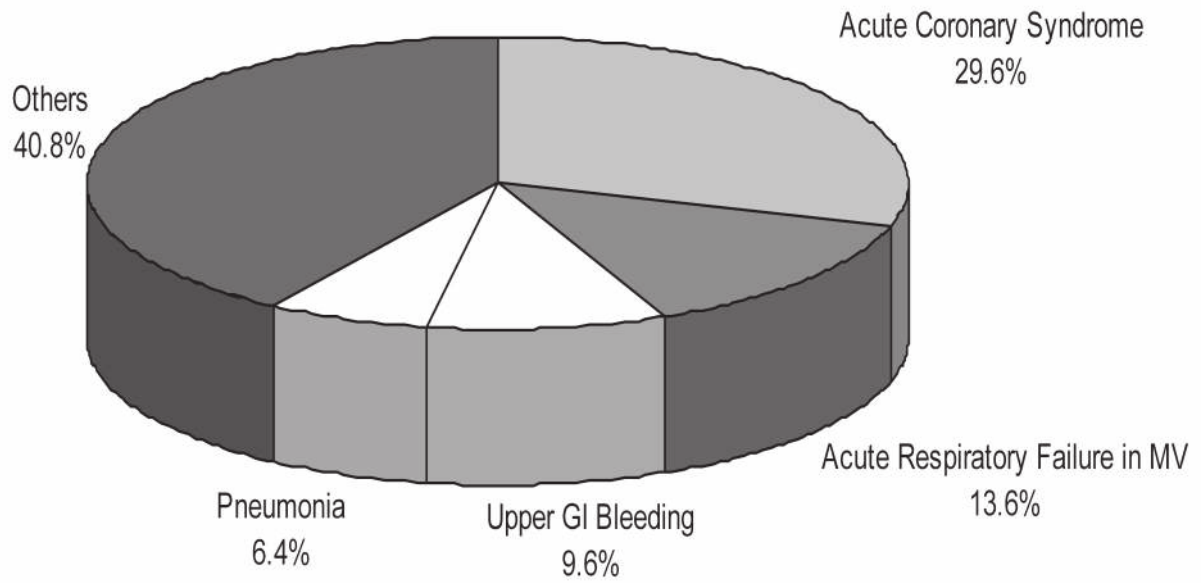


Figure 3. ICU Admission Criteria Compliance

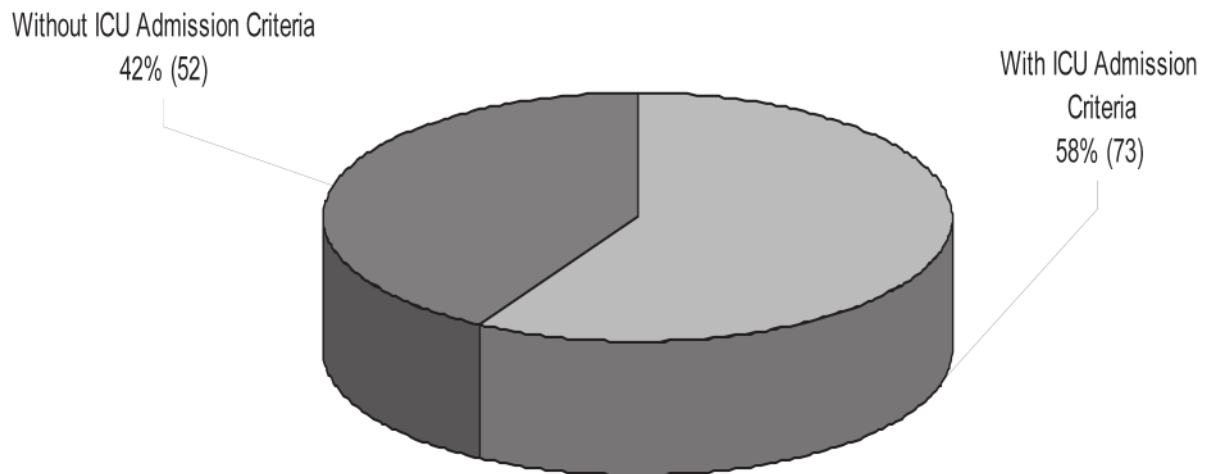


Figure 4. ICU Admission Primary Diagnosis Without Criteria

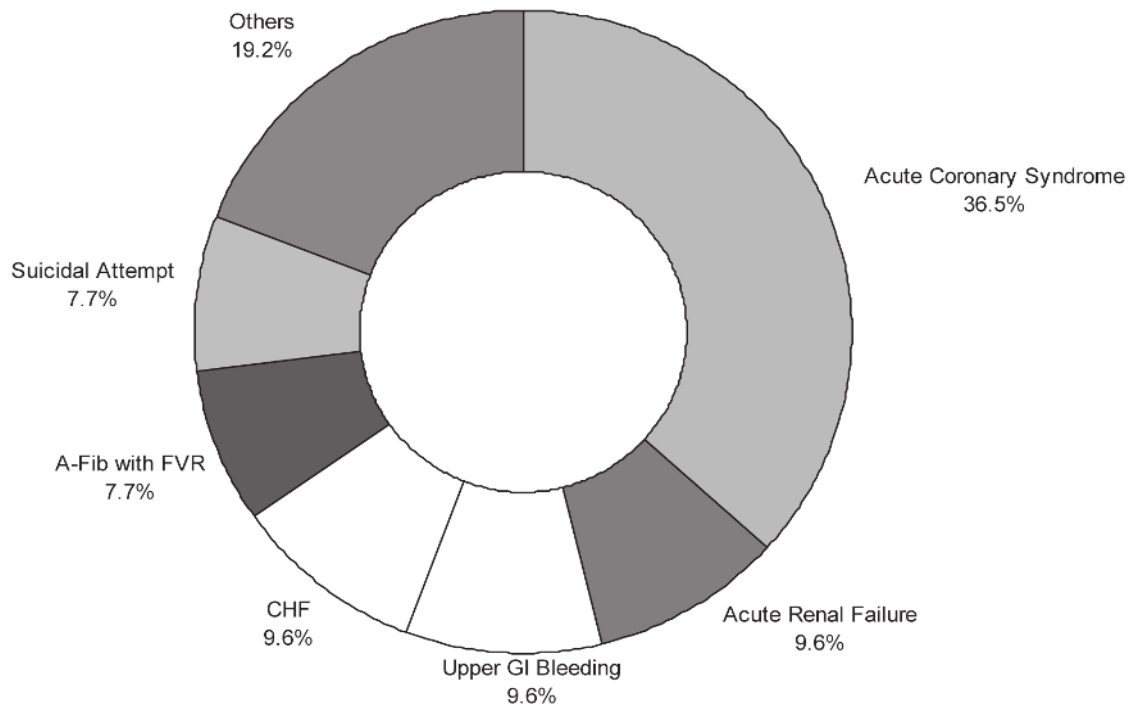


Figure 5. ICU Admission Primary Diagnosis With Criteria

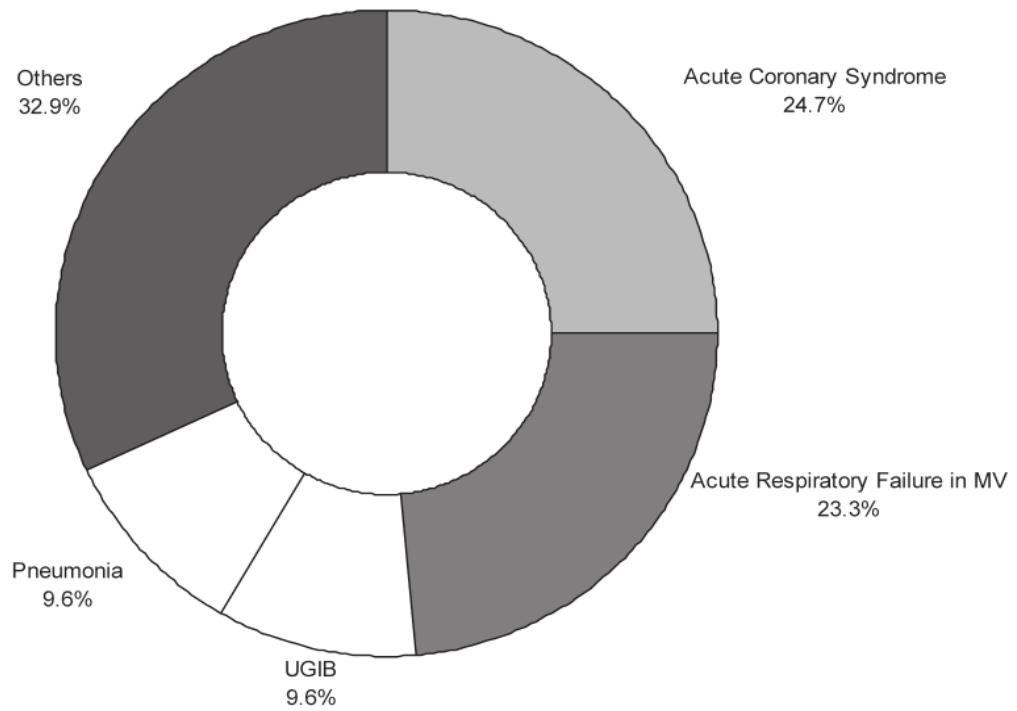


Figure 6. Diagnostic Model Criteria Distribution

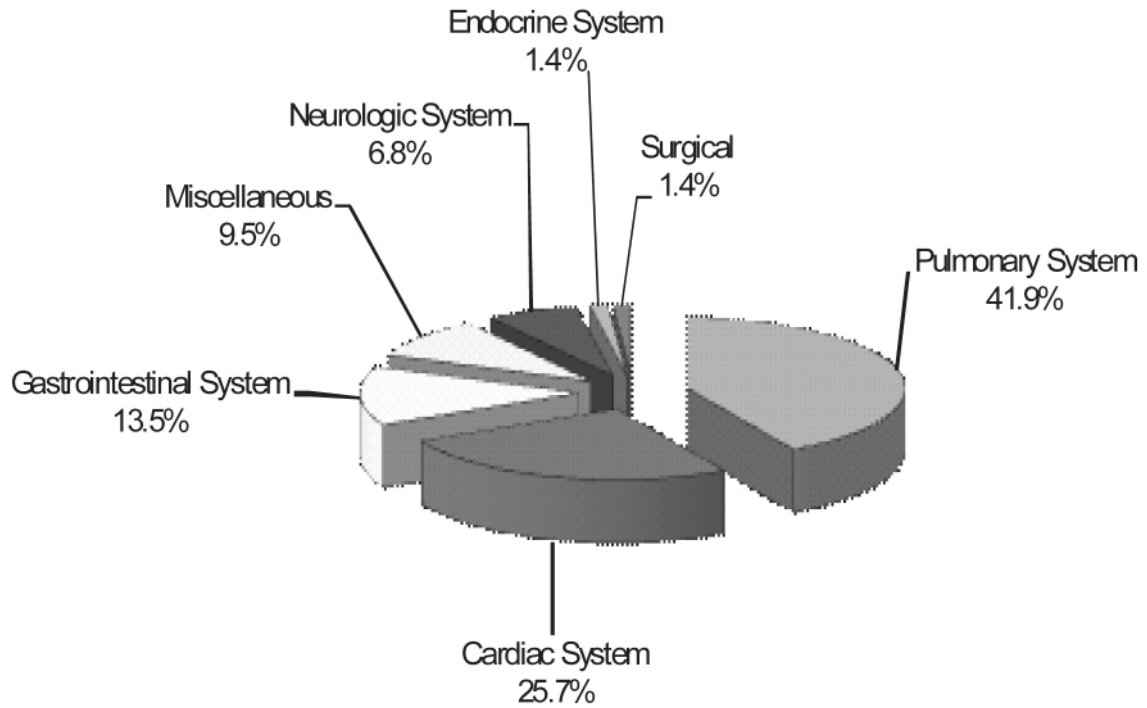


Figure 7. Pulmonary Diagnostic Criteria Distribution

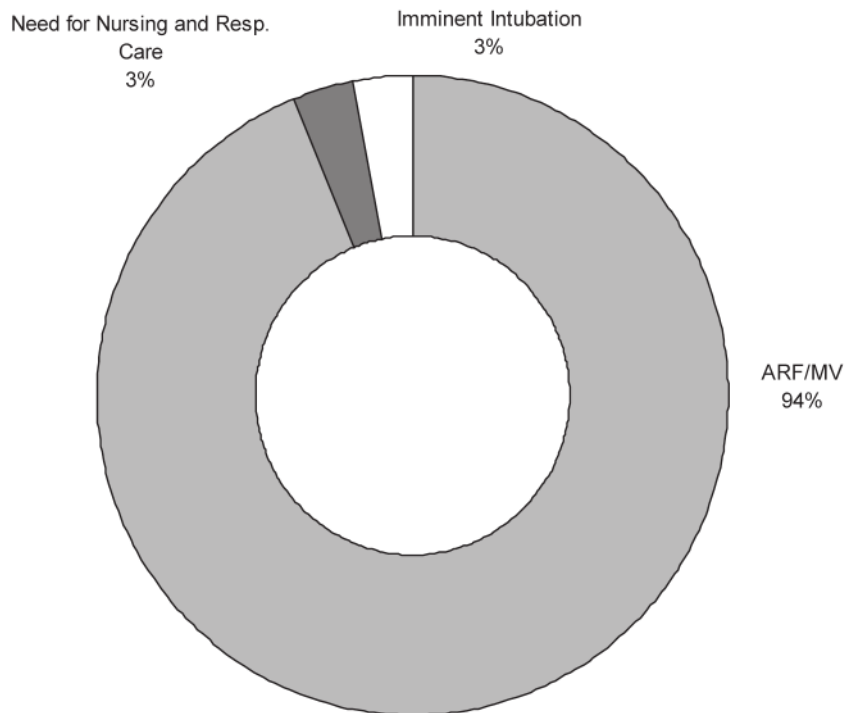


Figure 8. Respiratory Failure in Mechanical Ventilation Criteria: Diagnosis Distribution

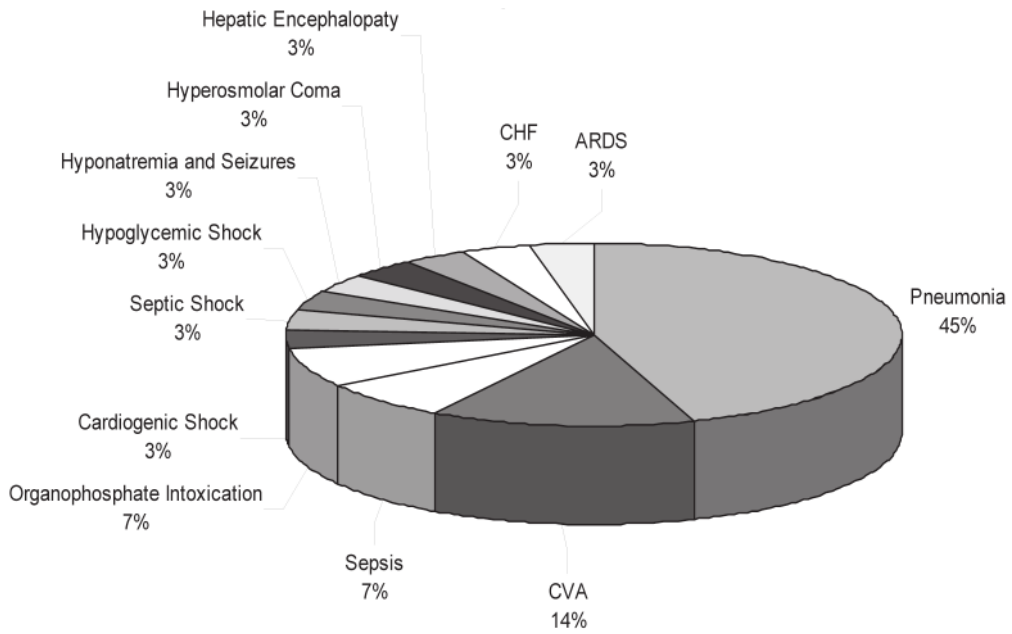


Figure 9. Objective Parameters Model Criteria

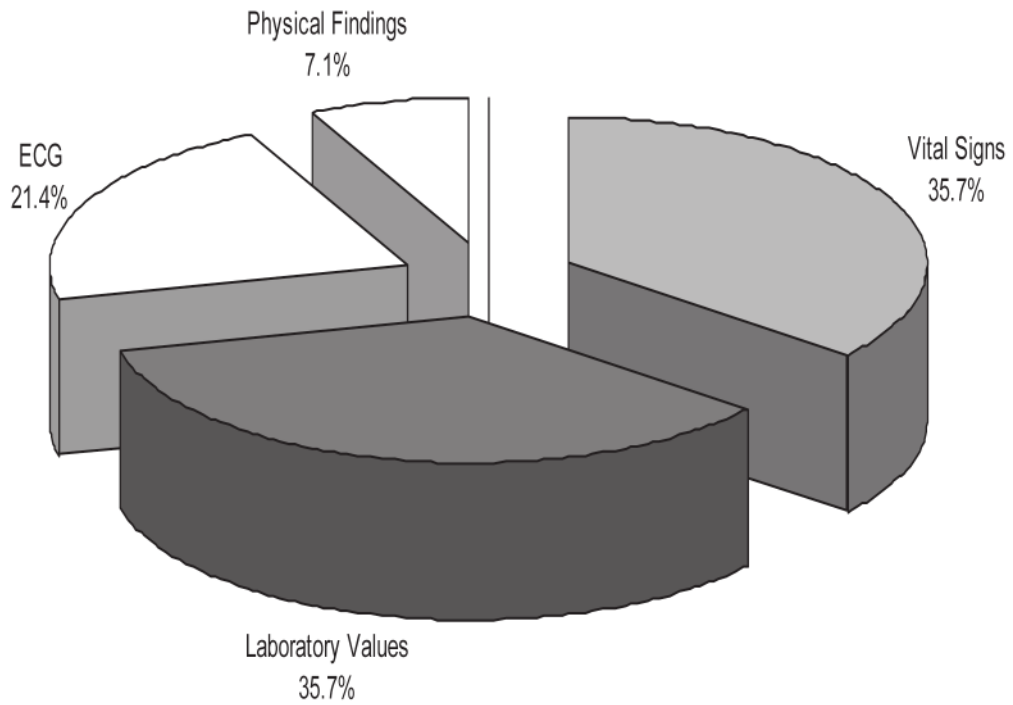


Figure 10. Vital Signs Parameters Criteria Distribution

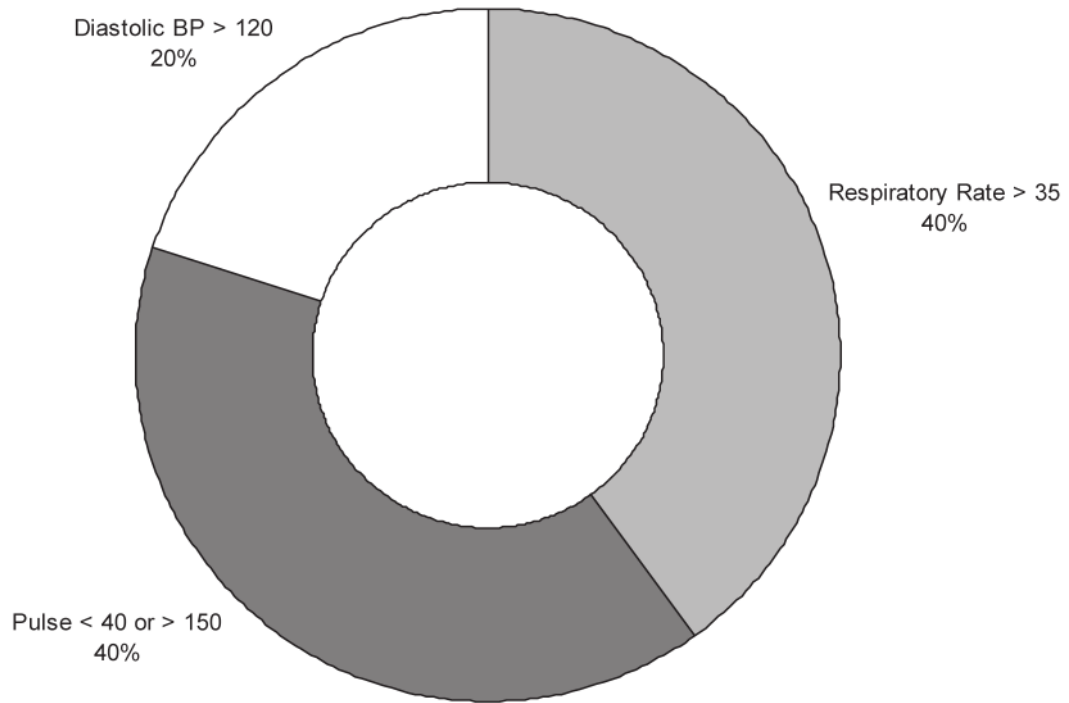


Figure 11. Vital Signs Parameters Criteria: Diagnosis Distribution

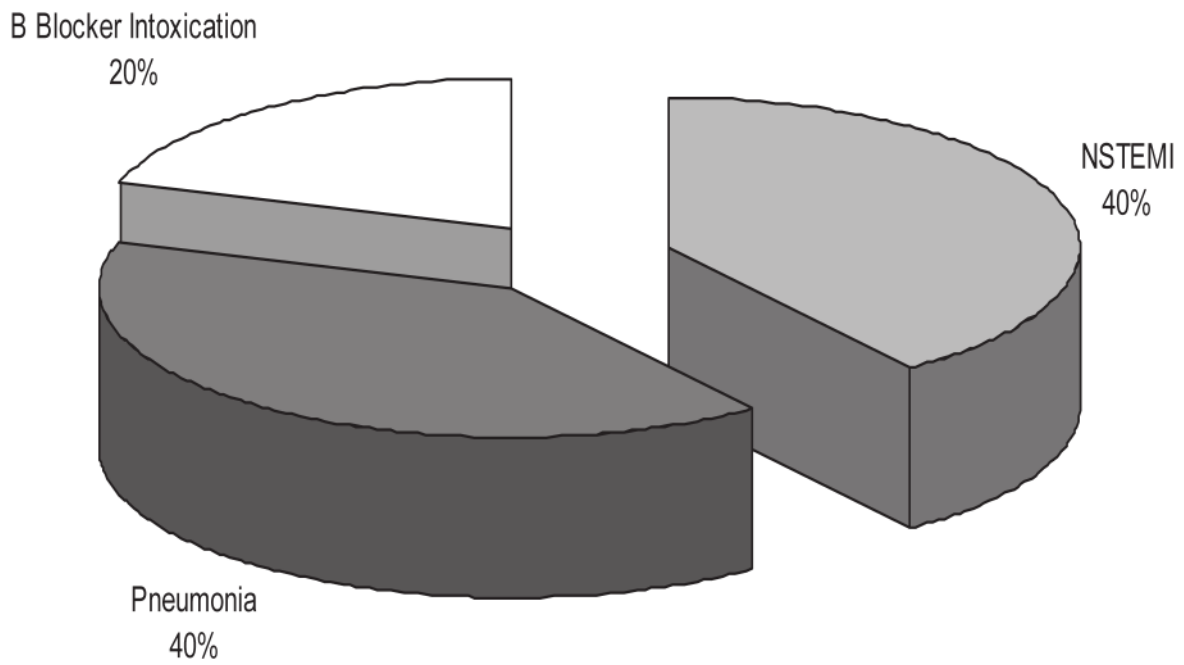


Figure 12. Laboratory Parameters Criteria Distribution

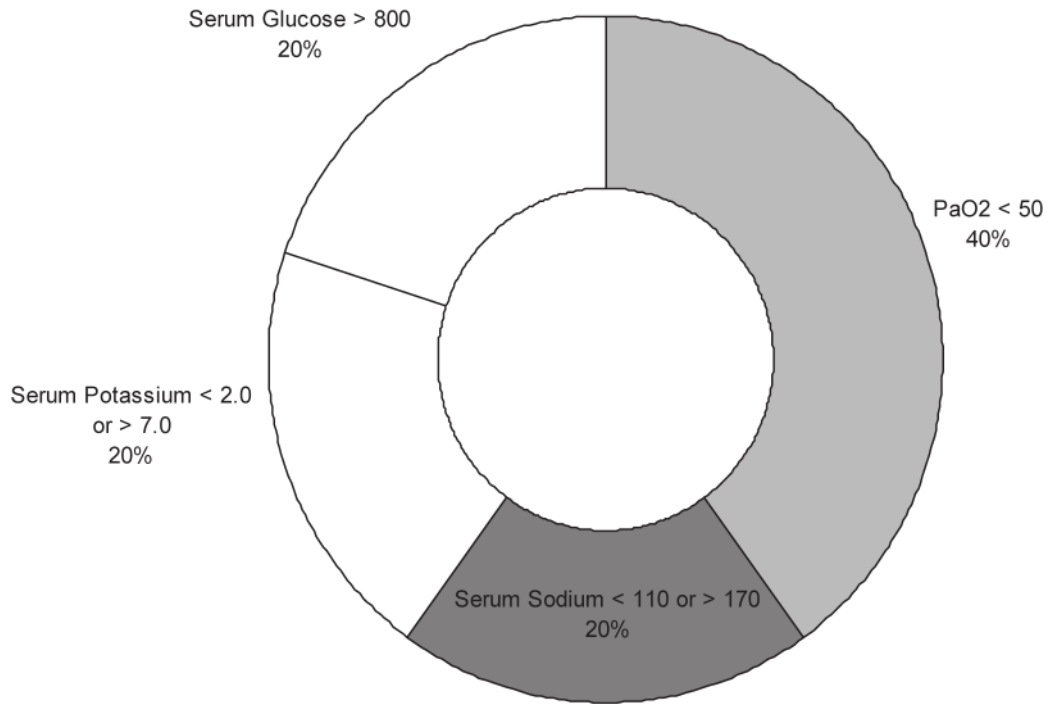
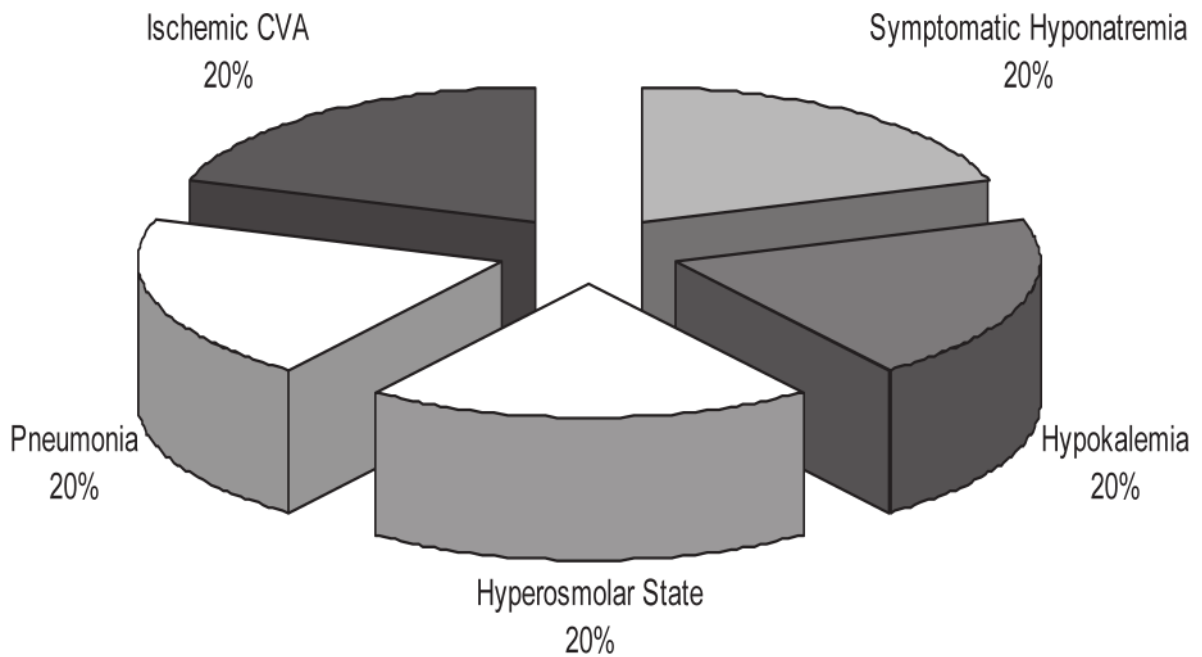


Figure 13. Laboratory Parameters Criteria: Diagnosis Distribution



Recommendations

- Create a committee which would review the admission criteria to ICU at San Juan City Hospital, and modify them in relation to national guidelines. This review should be done periodically.
- Instruct residents with the admission criteria to ICU, so we can decrease drastically the amount of patients admitted without criteria.
- Consider opening a Telemetry Unit and/or an Intermediate Care Unit at San Juan City Hospital in order to provide nursing care to patients who require close monitoring but not have ICU criteria.
- The ICU Committee should be revised, as frequent as needed, the compliance, of admitting staff, with the admission criteria to ICU.
- The ICU Committee should review the Protocol of Brain Death Management in our hospital, and instruct residents about it.

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Appendix

Diagnostic Test for Residents Internal Medicine.

SJCH

PGY _____

True (T) or False (F) Questions

1. ___ I know that in our hospital there are specific guidelines that regulate what kind of patient should be admitted to ICU.
2. ___ I know exactly what are the national guidelines for ICU Admission, Discharge and Triage.
3. ___ According to national guidelines for admission to ICU the age of 75 y/o or more is an important criteria to exclude the patient for ICU admission.
4. ___ If a patient signs a DNR order at any moment during his admission this would exclude him for ICU admittance.
5. ___ A patient with a diagnosis of Acute MI, even with no complications, should be admitted to ICU (or CCU) at least for the first 24 hours.
6. ___ The simply fact of necessity of hemodynamic monitoring in a patient is an important criteria for admission to ICU (or CCU).
7. ___ DKA is an enough criteria for admission to ICU, at least for 24 hours.
8. ___ According to national guidelines, Blood Glucose higher or equal to 800 mg/dL is a laboratory criteria for ICU admission.
9. ___ PaO₂ < 50 mmHg , PH < 7.1 or pH > 7.7 are very important independent laboratory parameters to decide admission to ICU.
10. ___ Seizures following drug ingestion is a criteria for ICU admission.
11. ___ Life threatening GI bleeding in a patient is a major criteria for admission to ICU.
12. ___ Acute ischemic stroke, even without altered mental status, is a major criteria for admission to ICU for at least the first 24 hours.
13. ___ A patient with a complete heart block, even if he is hemodinamically stable, should be admitted to ICU (CCU).
14. ___ Unstable critically ill patients who have a reduced likelihood of recovery, because their underlying diseases or the nature of their illness, has priority 3 level for ICU admission.
15. ___ Brain death or potentially brain death patients who are being aggressively managed while determining organ donation status is an appropriate ICU admission.
16. ___ Any postoperative patient who requires extensive nursing care should be admitted to ICU.
17. ___ During my rotation in the Urgency Department, the attending explain to me the hospital guidelines for admission to ICU and the levels of priority which are important to consider according to beds availability.
18. ___ As established in the SJCH guidelines, every patient in acute renal failure should be admitted to ICU at least for the first 24 hours.
19. ___ Hypertensive crisis should be admitted to ICU (CCU) for close monitoring during the first 24 hours.
20. ___ During my training as a Second Year Internal Medicine Resident, specially when I'm the admitting officer, I have the responsibility to decide if a patient qualifies for ICU admission.