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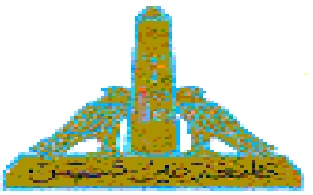

Approaches to

Admission & discharge criteria in intensive care departments

An essay submitted for partial fulfillment of master degree in intensive care medicine

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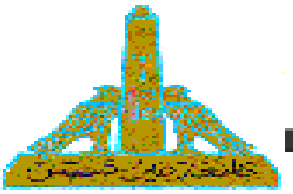

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معايير الحجز والخروج في الرعايات المركزه

رسالة توطئة للحصول علي درجة الماجستير
للغاية المركزة مقدمة من الطبيب:

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English summary

ICU beds are too precious to be wasted by admission of inappropriate patients that can be admitted safely to the ward or those that not expected to recover. Several systems developed to decompress the ICU facilities and team and best classify and arrange the patients and may provide them with higher level of care outside, pre or post admission to ICU to save beds for more critical patients via outreach mechanisms as medical emergency teams and rapid response teams. Each ICU should have it's own protocols for admission and discharge due to difference in facilities, targets and capacities.

The ICU director should be responsible for these local protocols, there application and training of the ICU team about use of them. The decision to admit to ICU still depending largely on the opinion of the physician and no guidelines can replace completely the experience of the intensivist. There are several models designed to help the physician to take a decision, one of them are the priorities system that categorizes patients according to their benefits from ICU, giving the first priority for patients who will have maximal benefit from admission. Diagnosis model system categorizes patients by diagnosis and objective parameter model use objective parameters and data to triage the

patient, usually vital signs, laboratory, radiographic and physical parameters. Most ICUs use a combined model taking into consideration all of the previous models. Scoring systems are usually numerical methods for initial and serial evaluation of ICU patients that can also determine prognosis of them and may influence some decisions regarding treatment plan for critical patients. The most common scoring systems are APACHE I, II, III, IV, sequential organ failure assessment score, simplified acute physiology score, multiple organ dysfunction score and different trauma scoring systems. As a general rule haemodynamic or ventillatory instability and need for support/monitoring are the main indications for ICU admission. Most admissions related to cardiovascular system usually involve shock by it's different types, acute coronary syndrome, acute life threatening arrhythmia, heart failure and hypertensive disorders, acute aortic syndromes, severe cardiac trauma and infective endocarditis.

Admissions to neuroscience ICUs usually due to disturbance of conciousness or need for neurological monitoring as an end result of several disorders and trauma involving central nervous system as haemorrhages, infarctions, infections and seizures.

Actual respiratory failure or liability to develop it and the need for respiratory monitoring and mechanical ventilation as in cases of COPD exacerbation, asthmatic episode, severe chest infection and life threatening pleural disease are the main indications for admissions related to respiratory system.

Most admissions due to gastro intestinal tract disorders usually related to bleeding, pancreatititis, acute/ fulminant hepatic failure. Diabetes millets complications are common causes for ICU admission, usually hypoglycemic coma, diabetic ketoacidosis and hyperosmolar states. Other endocrine emergencies should mandate ICU admission as life threatening thyroid storm, myxedematous coma, addisonian crisis, and pheochromocytoma crisis. Severe electrolytes disturbance and acute renal failure may mandate admission. Many ICUs consider admission of most of trauma victims under observation at least for 24 hours but different scoring/triaging systems and admission criteria have been developed for trauma victims to categorize them and prevent unnecessary admissions. High risk surgical patients should be admitted to ICU post operatively or may be preoperatively according to the condition of the patient and multiplicity of co morbidities but it's justifiable to routinely admit patients with emergency procedure.

Several scoring systems have developed to triage patients with burns and help decision either to admit to intensive care setting or surgical ward or managed on out patient admission are setting. Hematological emergencies requiring mainly severe coagulopathy with ongoing bleeding or severe anemia causing hemodynamic changes. Poisoned patients require careful triaging to prevent over or under estimstion of the condition. Emergencies that occur in some patient with malignancies as a result of compression or post chemo/radio therapy usually warrants admission, examples include tumor lysis syndrome, severe hyper calcemia and superior vena cava syndrome. Obstetric severe hemorrhages and eclampsia/pre eclampsia still the two major conditions that bring the pregnants to the ICU. As a general rule discharge from ICU may be done when a patient's physiologic status has stabilized and the need for ICU monitoring and care is no longer necessary.

Content

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LIST OF ABREVIATION

Abbreviation	*Meaning*
AAST	**American Association for the Surgery of Trauma**
ACE	**Angiotensin converting enzyme**
ACS	**Acute coronary syndrome**
ACTH	**Adreno cortico tropic hormone**
AIS	**Abbreviated Injury Score**
ALF	**Acute liver failure**
ALL	**Acute lymphocytic leukemia**
AMI	**Acute myocardial infarction**
AMI	**Acute mesenteric ischemia**
AP	**Anatomic Profile**
APACHE	**Acute physiology and chronic health**
aPTT	**Activated partial thromboplastin time**
ARAS	**Reticular activating system**
ARDS	**Adult respiratory distress syndrome**
ARF	**Acute renal failure**
ASA	**American Society of Anesthesiologist**
ASCOT	**A Severity Characterization of Trauma**
ASIA	**American spinal injury association**
ATLS	**Acute tumor lysis syndrome**
ATN	**Acute tubular necrosis**
ATS	**American Thoracic Society**
AV	**Atrio ventricular**
AVM	**Arterio venous malformation**
BMI	**Body mass index**
BTS	**British Thoracic Society**
CABG	**Coronary artery bypass graft**
CAP	**Community acquired pneumonia**
CCO	**Critical care outreach**
CHF	**Congestive heart failure**
CK	**Creatine kinase**
CK-MB	**Creatinine Kinase M band**
CMI	**Chronic mesenteric ischemia**
CNS	**Central nervous system**
COPD	**Chronic obstructive pulmonary disease**
CRAMS	**Circulation, Respiration, Abdomen, Motor, Speech**
CT	**Combuted tomography**
CVP	**Central venous pressure**
CXR	**Chest X ray**

DAI	**Diffuse axonal injury**
DIC	**Disseminated intravascular coagulation**
DKA	**Diabetic ketoacidosis**
DNR	**Do not resussitate**
ECG	**Electrocardiogram**
ED	**Emergency department**
ERCP	**Endoscopic retrograde cholangio pancreatography**
ESCC	**Epidural spinal cord compression**
EWS	**Early-warning score**
FEV	**Forced expiratory volume**
FIO2	**Fraction of inspired oxygen**
FOUR	**Full Outline of Un Responsiveness**
FVC	**Forced vital capacity**
GCS	**Glascow coma score**
GFR	**Glomerular filtration rate**
GIT	**Gastro intestinal tract**
HAART	**Highly active antiretroviral therapy**
HARM	**Harborview Assessment for Risk of Mortality**
HCV	**Hepatitis C virus**
HELLP	**Hemolysis , elevated liver enzymes ,low platelets**
HHS	**Hyperosmolar hyperglycemic non ketotic syndrome**
HIV	**Human immunodeficiency virus**
HOCM	**Hypertrophic obstructive cardiomyopathy**
HRS	**Hepato renal syndrome**
HTN	**Hypertension**
ICD	**Implantable cardioverter defibrillator**
ICD	**International Classification of Diseases**
ICF	**Intra cellular fluid**
ICISS	**International Classification of Diseases based Injury Severity Score**
ICH	**Intracerebral haemorrhage**
ICU	**Intensive care unit**
IE	**Infective endocarditis**
INR	**International normalized ratio**
ISS	**Injury Severity Score**
Kph	**Kilo per hour**
LBBB	**Left bundle branch block**
LV	**Left ventricle**
MELD	**Model for end-stage liver disease**
METs	**Medical emergency teams**
MRI	**Magnetic resonance imaging**
MSCC	**Malignant spinal cord compression**

MVCs	**Motor vehicle crashes**
NASH	**Nonalcoholic steatohepatitis**
NCCU	**Neurocritical care units**
NG	**Naso gastric**
NIH	**National Institutes of Health**
NISS	**New Injury Severity Score**
NOMI	**Nonocclusive mesenteric ischemia**
NSAIDS	**Non steroidal anti inflammatory drugs**
NSU	**Neuro science ICU**
OIS	**Organ Injury Scale**
PA	**Pulmonary artery**
PATI	**Penetrating Abdominal Trauma Index**
PC	**Prothrombin concentration**
PCI	**Per catenous coronary intervention**
PCP	**Pneumocystis pneumonia**
PPCM	**Peripartum cardiomyopathy**
PT	**Prothrombin time**
PTH	**Parathormon hormone**
PTHrP	**parathyroid hormone-related protein**
RBCs	**Red blood cells**
RIFLE	**Risk, Injury, Failure, Loss, End stage**
RPLS	**Reversible posterior leukoencephalopathy syndrome**
RR	**Respiratory rate**
RRTs	**Rapid response teams**
RTS	**Revised Trauma Score**
RV	**Right ventricle**
SAH	**Sub arachnoid haemorrhage**
SBP	**Spontaneous bacterial peritonitis**
SBP	**Systolic blood pressure**
SDH	**Subdural hemorrhage**
SE	**Status epilepticus**
SIRS	**Systemic Inflammatory Response Syndrome**
SOFA	**Sequential Organ Failure Assessment**
SRR	**Survival Risk Ratios**
STEMI	**ST segment myocardial infarction**
TBI	**Traumatic brain injury**
TBSA%	**percentage of total burn surface area**
TLC	**Total leucocytes count**
TRISS	**Trauma and Injury Severity Score**
TS	**Trauma Score**
UOP	**Urine output**
UK	**United kingdom**

URL	**Upper rate limit**
SAH	**Subarachnoid hemorrhage**
SCI	**Spinal cord injury**
SVC	**Superior vena cava syndrome**
URL	**Upper rate level**
VTE	**venous thromboembolism**
V/Q	**ventilation/ perfusion**
WBCs	**White blood cells**
WPW	**Wolf Parkinson white syndrome**

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 . 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" . With recent changes in the health care environment, efficient use of ICUs has become a priority. ***(Kollef et al., 1994).***

Few studies have examined the indications for and the outcome of ICU care, and suggested that we may not categorize patients accurately. This can be noted in cases of drug overdose patients that commonly admitted to an ICU , although they are not in need for ICU interventions without clinically determined high risk criteria (hemodynamic unstability,significant laboratory abnormalities, unresponsiveness and threatened airways). ***(Kollef et al., 1994).***