
بسم الله الرحمن الرحيم
إقرأ باسم ربك
الذي خلق﴿1﴾خلق
الإنسان من
علق﴿2﴾ إقرأ
وربك
الأكرم﴿3﴾الذي
علم بالقلم﴿4﴾علم
الإنسان ما لم
يعلم﴿5﴾
صدق الله العظيم
سورة العلق

INNOVATION IN THE INTENSIVE CARE UNIT DESIGN AND POLICY

Presented By

Shirin Fekry Abd Elazim Emara
M.M.B.B.CH, Faculty of Medicine
Misr University for Science and Technology

Supervised By

Prof. Dr. Sherif Wadie Nashed
Professor of Anesthesia and Intensive Care
Faculty of Medicine - Ain Shams University

Dr. Heba Bahaa El Din El Serwi
Lecturer of Anesthesia and Intensive Care
Faculty of Medicine - Ain Shams University

Dr. Mayar Hassan El Sersi
Lecturer of Anesthesia and Intensive Care
Faculty of Medicine- Ain Shams University

Faculty of Medicine
Ain Shams University
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List of Abbreviations

Abb.	Full term
AAH	Academy of Architecture for Health
AAST	American Association for the Surgery of Trauma
ACE	Angiotensin converting enzyme
ACS	Acute coronary syndrome
ACTH	Adreno cortico tropic hormone
AIA	American Institute of Architects
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

List of Abbreviations

Abb.	Full term
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
CPOE	Computerized Physician Order Entry
CRAMS	Circulation, Respiration, Abdomen, Motor, Speech
CRRT	Continuos Renal Replacement Therapy
CSSD	Central Sterile Supply Department
CT	Computed tomograph
CVP	Central venous pressure
CXR	Chest X ray
DAI	Diffuse axonal injury
DIC	Disseminated intravascular coagulation
DKA	Diabetic ketoacidosis
DNR	Do not resuscitate

List of Abbreviations

Abb.	Full term
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
HDU	High Dependency Unit.
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
HVRs	High visible rooms

List of Abbreviations

Abb.	Full term
ICD	Implantable cardioverter defibrillator
ICD	International Classification of Diseases
ICF	Intra cellular fluid
ICH	Intracerebral haemorrhage
ICISS	International Classification of Diseases based Injury Severity Score
ICU	Intensive care unit
IE	Infective endocarditis
IEEE	Institute of Electrical and Electronics Engineers
INR	International normalized ratio
ISS	Injury Severity Score
Kph	Kilo per hour
LBBB	Left bundle branch block
LV	Left ventricle
LVRs	Low visible rooms
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
NIBP	Non-invasive measurement of blood pressure

List of Abbreviations

Abb.	Full term
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
RRT	Renal Replacement Therapy
RRTs	Rapid response teams
RTS	Revised Trauma Score
RV	Right ventricle
SAH	Sub arachnoid haemorrhage
SAH	Subarachnoid hemorrhage

List of Abbreviations

Abb.	Full term
SBP	Spontaneous bacterial peritonitis
SBP	Systolic blood pressure
SCCM	Society of Critical Care Medicine
SCI	Spinal cord injury
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
SVC	Superior vena cava syndrome
TBI	Traumatic brain injury
TBSA%	percentage of total burn surface area
TLC	Total leucocytes count
TRISS	Trauma and Injury Severity Score
TS	Trauma Score
UK	United kingdom
UOP	Urine output
URL	Upper rate limit
URL	Upper rate level
V/Q	ventilation/ perfusion
VTE	venous thromboembolism
WBCs	White blood cells
WPW	Wolf Parkinson white syndrome

INTRODUCTION

The intensive care unit is a highly specified and sophisticated area of a hospital which is specifically designed, staffed, located, furnished and equipped, dedicated to management of critically ill patients, injuries or complications. It is a department with dedicated medical, nursing and allied staff. It is operated with defined policies, protocols and procedures, having its own quality control, education, training and research programs. It is emerging as a separate specialty that has to have its own separate team in terms of doctors, nursing personnel and other staff who are tuned to the requirement of the specialty ***(Narendra et al., 2010).***

In 1997 a task force of the European Society of Intensive Care Medicine (ESICM) published a paper aimed to describe minimum requirements for intensive care departments. These recommendations had an impact on guidelines of national intensive care societies as well as legislative documents (e.g., in Greece). Since then intensive care medicine and even more the conditions of its practice have changed considerably causing the need for an update of these recommendations. In 2008 the ESICM Working Group of Quality Improvement (WGQI) addressed this task and was endorsed by the ESICM council and the ESICM executive committee ***(Andreas Patrick, 2011).***

The old concept of identifying the intensive care units as just a separate area with high-tech equipment no longer holds true. The sheer volume of technology, the unfamiliar, sterile surroundings, lack of privacy, constantly revolving medical teams, incessant noise and glaring light, and the lack of natural forms, materials, and sensory experiences all are considered to be a traumatic experience for the patient and his family. As a result, the patients feel trapped in an environment they dislike and cannot control and their families feel helpless so patients and their families are asking for friendly environments that have a more natural feel and look. For that reason the patient-centered design has become the hallmark of most new construction in the health care field where the intensive care unit design should provide comfort to patients, reduce hospital acquired infections and cost of intensive care unit stay. Consequently, improved décor, more privacy, reduced environmental stressors, natural surroundings, and greater patient control are becoming common concerns ***(Alex, 2004).***

The ICU Design Team should be approached by a multidisciplinary team consisting of the ICU medical director, the ICU nurse manager, the chief architect, hospital administration, and the operating engineering staff ***(Suzanne et al., 1995).***

The effective team communication and coordination are recognized as being crucial for improving quality and safety in

acute medical settings such as the intensive care unit ***(Reader et al., 2006).***

The intensive care unit is a dynamic environment with often rapidly changing patient conditions. We have to provide daily, timely information on the patient's condition. Families will be asked to identify a spokesperson that will then be able to inform family and friends about the patient's condition. This ensures that information about the patient is given to the appropriate people. Also, it decreases the number of enquiries that staff receives about each patient. Additional information is available at reception describing the benefits and risks of various procedures the patient may undergo as part of their treatment ***(Reader et al., 2006).***

An ICU should have a policy for patient admission, discharge and deaths as well as policy for patient's management, transferring and procedures done ***(Robert and Royal, 2010).***

Units smaller than 5 or 6 beds are inefficient to operate and manage, It is important to suggest that units larger than 8–9 beds are difficult to design with high quality observation from a central position, which has been a fundamental principle of ICU design from the beginning. If larger *numbers are required, suggestion* of breaking them into pods or clusters of 7 or 8 beds, grouped together to form a larger department under single management ***(Kirk, 2010).***