Ain Shams University - Faculty of Medicine
Department of Anesthesiology, Intensive Care and Pain Management

Indications for Postoperative Intensive Care Unit Admission between Anticipation and Urgency

Essay

Submitted for Partial Fulfilment of Master Degree in
Anesthesia

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LIST OF ABBREVIATIONS

Abbrev.	Full Term
ACS	American College of Surgeons
AIDS	Acquired immune deficiency syndrome
AIMS	Australian Incident Monitoring Study
ASA	American Society of Anesthesiologists
BMI	Body mass index
BP	Blood pressure
BSA	Body surface area
BUN	Blood urea nitrogen
CCI	Charlson Comorbidity Index
COPD	Chronic obstructive pulmonary diseases
CPAP	Continuous positive airway pressure
Cr-POSSUM	Colorectal Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity
CRS	Comprehensive risk score
CVP	Central venous pressure
DIC	Disseminated intravascular coagulation
DLCO	Diffusing lung capacity for carbon monoxide
ECF	Extracellular fluids
ECG	Electrocardiogram
E-PASS	Estimation of Physiologic Ability and Surgical Stress
ESICM	European Society of Intensive Care Medicine

LIST OF ABBREVIATIONS (CONT.)

Abbrev.	Full Term
FEV	Forced expiratory volume
FiO$_2$	Fraction of inspired oxygen
FVC	Forced vital capacity
GCS	Glasgow Coma Scale
GFR	Glomerular filtration rate
HDU	High dependency unit
ICF	Intracellular fluids
ICU	Intensive care unit
IDDM	Insulin-dependent diabetes mellitus
INR	International Normalized Ratio
IPPV	Intermittent Positive Pressure Ventilation
JVP	Jugular venous pressure
MAP	Mean arterial pressure
MG	Myasthenia gravis
MH	Malignant hyperthermia
NSAIDs	Non-steroidal anti-inflammatory drugs
NYHA	New York Heart Association
OSS	Operative severity score
PaO$_2$	Partial pressure of arterial oxygen
PAR	Pressure-adjusted heart rate
PE	Pulmonary embolism
PEEP	Positive end-expiratory pressure
PFTs	Pulmonary function tests

LIST OF ABBREVIATIONS (CONT.)

Abbrev.	Full Term
POSSUM	Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity
P-POSSUM	Portsmouth Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity
PRS	Preoperative risk score
PS	Physiological score
RCRI	Revised Cardiac Risk Index
SAS	Surgical Apgar Score
SGOT	Serum glutamic oxaloacetic transaminase
SOB	Shortness of breath
SSS	Surgical stress score
SVR	Systemic vascular resistance
TURP	Transurethral resection of prostate
VA	Veterans Administration
VC	Vital capacity

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Maha Salah Omar Ismail Mansour

﴿قالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ﴾

صدق الله العظيم

...سورة البقرة آية (٣٢)

The concept of intensive care unit (ICU):

In the ١٨٥٠s during the Crimean War, it was the site which defined the pioneering contribution of what became Critical Care by Florence Nightingale, who is generally viewed as the parent of professional nursing. Nightingale segregated the most severely battle injured soldiers and bedded them in close proximity to the nursing station so that they might receive more "intensive nursing care" ***(Weil and Shoemaker, ٢٠٠٤).***

In ١٩٢٣, the concept of postoperative recovery was modelled by Dr. Walter Dandy who organized a neurosurgical postoperative care unit at Johns Hopkins Hospital in Baltimore, enlisting specialized nursing staff. Professional nurses therefore became the first bedside specialists rendering critical care under the direction of neurological surgeons. This initial intensive care also became a model for postoperative recovery units, which provided intensive postoperative management for military causalities during the Second World War ***(Byan, ١٩٩١).***

Bjorn Ibsen in Denmark utilized manual methods of positive pressure ventilation by recruiting medical students who

- Current complain of chest pain considered secondary to myocardial ischemia.
- Use of nitrate therapy.
- ECG with pathological Q waves.

٣. History of congestive heart failure:

- History of congestive heart failure.
- Pulmonary edema.
- Paroxysmal nocturnal dyspnea.
- Bilateral rales or S٣ gallop.
- Chest radiograph showing pulmonary vascular redistribution.

٤. History of cerebrovascular disease:

- History of transient ischemic attack or stroke.

٥. Preoperative treatment with insulin.

٦. Preoperative serum creatinine > ٢,٠ mg/dL.

Table (٤): Revised cardiac risk index ***(Andrew and Lee, ٢٠٠٦):***

Points	Class	Risk
٠	I	٠,٤٪
١	II	٠,٩٪
٢	III	٦,٦٪
٣ or more	IV	١١٪

Anesthesia and surgery combined are independent risk factors for ischemic stroke during the perioperative period ***(Wong et al, ٢٠٠٠).***Patients can experience hypotension secondary to general anesthesia, fluid loss, and blood loss ***(Bernstein, ٢٠٠٦).***

Previous cerebrovascular events were most predictive of perioperative stroke ***(Selim, ٢٠٠٧).***

Delayed recovery from general anesthesia is the main symptoms. Patient may develop disturbed level of consciousness, unequal pupils, motor impairment and sensory impairment.

General supportive care and prevention of complications are also important to patients with perioperative stroke. This may be best achieved by moving the surgical patient to an Acute Stroke Unit, where management is coordinated by stroke neurologists. Partial airway obstruction, hypoventilation, aspiration pneumonia, and atelectasis are common causes of hypoxia that may worsen the brain injury. Both hypertension and hypotension are associated with poor outcome after stroke. Urgent correction of common postoperative causes of hypotension, including volume depletion, blood loss, myocardial ischemia or arrhythmias, may improve neurologic outcomes ***(Julie et al, ٢٠١١).***

utilized bag ventilation for the victims ***(Ristagno and Weil, ٢٠٠٩).***

The modern ICU had evolved in the late ١٩٥٠s in a historical sequence beginning a century earlier with a site of care in proximity to and with the loyalty of professional nursing talent. Recruitment and training of special nursing and medical expertise followed in the mid-٢٠th century. Increasing capability of professionals who were prepared to implement life support interventions followed the introduction of monitors, measurements, and life support technologies. The post anesthesia recovery units maybe viewed, at least in part, as predecessors of the ICUs as we know them today. The first surgical ICU was established in Baltimore, and, in ١٩٦٢, in the University of Pittsburgh. In ١٩٧٠, the Society of Critical Care Medicine was formed ***(Ristagno and Weil, ٢٠٠٩).***

The ICU 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. Care in the ICU differs from other hospital units; seriously ill patients require close observation

and monitoring. Specially trained nurses care for one or two patients at a time, each shift. ICU doctors are specially trained critical care doctors. Patients may have special equipment in their room, depending on their unique situation and condition. The equipment in the ICU may seem overwhelming. Patients are connected to machines to monitor their heart, blood pressure, and respiratory rate. Ventilators help some patients breathe until they are able to breathe on their own ***(Multz et al, ١٩٩٨).***

ICU Admissions:

Over ٤٠ % of ICU admissions are for postoperative patients. An unplanned admission to an ICU within ٢٤ hours of surgery is an event that most patients and physicians would consider to be an important adverse outcome. Such an unfavourable outcome results from an amalgamation of inherent risk factors surrounding a combination of coincidences and even misjudgements in the perioperative period. The multifactorial interaction of patient, anesthesia and surgical variables determines overall patient risk. Early recognition and intervention remains the key to avoidance of unfavourable outcome ***(Rose et al, ١٩٩٦).***