Anesthesia for patients too sick to be anesthetized

An Essay

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List of Abbreviations

3D	Three dimensional
ACC/AHA	American College of Cardiology/American Heart Association
ACE	Angiotensin-converting enzyme
ACoTS	Acute coagulopathy of trauma-shock
ACS	Acute coronary syndrome
ADP	Adenosine diphosphate
AI	Aortic insufficiency
AI	Aortic incompetence
AKI	Acute kidney injury
ALI	Acute lung injury
ALT	Alanien transaminase
AP	Action potential
APAP	Acetyl-para-aminophenol
APRV	Airway pressure release ventilation
ARBs	Angiotensin receptor blockers
ARDS	Acute respiratory distress syndrome
ARMA	Prospective, Randomized, Multi-Center Trial of 12ml/kg Tidal Volume Positive Pressure Ventilation for Treatment of Acute Lung Injury and Acute Respiratory Distress Syndrome
AS	Aortic stenosis
ASA	The American Society of Anesthesiologists
ASRA	American Society of Regional Anesthesia and Pain Medicine
AST	Aspartate transaminase
ATLS	The Advanced Trauma Life Support
ATP	Adenosine triphosphate
AV	Aortic valve
AVM	Arteriovenous malformations
BiPAP	Biphasic positive airway pressure
BMI	Blunt myocardial injury

CABG	Coronary artery bypass grafting
CBF	Cerebral blood flow
CESAR	Conventional Ventilation or ECMO for Severe Adult Respiratory Failure
CNS	Central nervous system
CO	Cardiac output
CO_2	Carbon dioxide
CPAP	Continuous positive airway pressure
CPP	Cerebral perfusion pressure
CRRT	Continuous renal replacement therapy
CT	Computed tomography
CTA	Computed tomography angiography
CVAs	Cerebrovascular accidents
CVP	Central venous pressure
CVVH	Continuous venovenous hemofiltration
CVVHD	Continuous venovenous hemodialysis
DP	Drive pressure
DP	Oscillatory pressure amplitude
EADs	Early after depolarizations
ECG	Electrocardiogram
ECLS	Extracorporeal life support
ECMO	Extracorporeal membranous oxygenation
ED	Emergency department
FDA	Food and Drug Administration
FES	Fat embolism syndrome
FIO_2	Fractional inspired oxygen
GERD	Gastroesophageal reflux disease
GFR	Glomerular filtration rate
GSH	Glutathione
HERG	Human ether-a-go-go
HFOV	High-frequency oscillatory ventilation
HR	Heart rate
HTS	Hypertonic saline
Hz	Hertez
IABP	Intra-aortic balloon pump

ICP	Intracranial pressure
ICU	Intensive care unit
LA	Left atrial
LAs	Local anesthetics
LSD	Lysergic acid diethylamide
LV	Left ventricle
LV	Left ventricular
LVH	Left ventricular hypertrophy
MAP	Mean arterial pressure
MDMA	Methylenedioxymethamphetamine
MH	Malignant hyperthermia
MHgb	Methemoglobin
mPaw	Mean airway pressure
MRA	Magnetic resonance angiography
MT	Massive transfusion
NAC	N-acetylcysteine
NaCl	Sodium chloride
NADH	Nicotine adenenine dihyronucleide
NAPQI	N-acetyl-p-benzoquinoneimine
NDMB	Non-depolarizing muscle blockers
NICE SUGAR	Normoglycemia in Intensive Care Evaluation–Survival Using Glucose Algorithm Regulation
NMDA	N-methyl-D-aspartate
NMS	Neuroleptic malignant syndrome
NSAIDS	Non steroidal anti-inflammatory drugs
NSTEMI	Non ST-segment elevation
OI	Oxygenation index
OLS	Open lung strategies
OR	Operating room
OSCILLATE	The Oscillation for ARDS Treated Early
PAC	Pulmonary artery catheter
PaO_2	Oxygen dissolved in blood
PAO_2	Alveolar oxygen tension
PBW	Predicted body weight
PCP	Phencyclidine

PCV	Pressure-controlled ventilation
PE	Pulmonary embolism
PECLA	Pumpless extracorporeal lung assist
PEEP	Positive end-expiratory pressure
P_{high}	Inspiratory pressure
PIP	Peak inspiratory pressure
P_{low}	Expiratory pressure
PT	Prothrombin time
RBC	Red blood cell
RRT	Renal replacement therapy
SPV	Systolic pressure variation
SS	Serotonin syndrome
SSRIs	Selective serotonin reuptake inhibitors
STEMI	ST-segment elevation
SVR	Systemic vascular resistance
TAI	Traumatic aortic injury
TBI	Traumatic brain injury
TdP	Torsades de pointes
TEE	Transesophageal echocardiography
TIAs	Transient ischemic attacks
T_{low}	The time spent at P_{low}
TRALI	Transfusion-related acute lung injury
TTE	Transthoracic echocardiography
V/Q	Ventilation-perfusion
VAP	Ventilator-associated pneumonia
VCV	Volume-control ventilation
VILI	Ventilator-induced lung injury
V_T	Tidal volume
VV	Venovenous
VVDL	Venovenous double lumen

Introduction and aim of work

Introduction

By their very nature, surgical patients are ‘‘sick’’, some more so than others.

Anesthesiologists, however, are accustomed to create a very low-risk environment for their patients. The balance between underlying medical problems and the need to provide surgical therapy must include careful consideration of the risks and benefits. However, only with a comprehensive understanding of the underlying pathology and its effect on anesthesia can a decision be made to proceed with the surgery despite significant medical dangers **(Benjamin &Stanley, 2010).**

Surgical patients with limited organic reserve are considered high-risk patients and have increased perioperative mortality. For this reason, they need a more rigorous perioperative protocol of hemodynamic control to prevent tissue hypoperfusion **(Sanderland& Paulo, 2010).**

Preoperative planning should include a plan for the transport to the operating room because patients are at high risk of adverse events during transport. The anesthesiologist must decide which monitors are necessary

for the assessment of the patient's condition, taking into account the advantages and pitfalls of various different options. General anesthesia is most often planned for surgery in the critically ill patient. The anesthesiologist may need to plan a total intravenous anesthetic technique if the patient has severe respiratory failure and requires an ICU ventilator intraoperatively for adequate oxygenation and ventilation. Regional anesthesia should be given due consideration as it can play a valuable adjunctive role to achieve optimum patient comfort and reduce physiologic stress **(Jeanand Judith, 2008).**

Complications can occur as part of any surgical admission. They can be distressing and inconvenient or life threatening. They are most likely to occur after major surgery or in patients with significant cardiac,respiratory, hepatic or renal morbidity. Complications causing single organ or system failure can lead inexorably to multiple system failure or even death. When resources and beds are scarce, treatment of complications occupies medical and nursing time, and increases length of hospital stay.
They can also result in litigation.Complications occur when organs begin to fail. Organs fail when:

- they are not adequately perfused with blood

- They are not supplied with sufficiently oxygenated blood.
- Functionis diminished by toxins.
- Combination of the above **(Dan and Jeremy, 2004**).

This study will discuss recent advances in the anesthetic management of critically ill patients regarding preoperative preparation, choice of anesthetic technique, intraoperative and postoperative management according to patient condition.

Aim of work