Anesthesia Outside OR and Patient Safety

Essay

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Marwa Mohamed Abd El Hady

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List of Abbreviations

ASA	American society of anesthiologists
PFTs	Pulmonary function tests
OSA	Obstructive sleep apnea
ECG	electrocardiography
NYHA	New York Heart association
BUN	Blood urea nitrogen
LVEF	Left ventricular ejection fraction
PS	Physical status
BMI	Body mass index
ABG	Arterial blood gases
FEV1	Forced expiratory volume 1
Hb A1C	Glycosylated hemoglobin
HTN	Hypertension
ACC/ AHA	American College of Cardiology and the American Heart Association
PT	Prothrombin time
NPH	Neutral protamine hagedron
NPO	Nill per os
COHb	carboxyhemoglobin
O2Hb	oxyhemoglobin
MetHb	methemoglobin
ETCO2	End tidal carbon dioxide
OR	Operation room
GA	General anesthesia
MAC	Monitored Aesthesia care
GABA	Gamma –aminobutyric acid
CNS	Central nervous system
EEG	electroencephlography
ETT	Endotracheal tube
LMA	Laryngeal mask airway
TIVA	Total intravenous anesthesia

List of Abbreviations (Cont.)

NSAIDs	Non steroidal anti-inflammatory drugs
MRI	Magnetic Resonance
CT	Computed Tomography
FDA	Food and Drud administration
RFA	radiofrequency
ERCP	Endoscopic retrograde cholangiopancreatography
GI	gastrointestinal
CSF	Cerebrospinal fluid
MRA	Magnetic Resonance Angiography
MRV	Magnetic Resonance Venography
DTPA	Dithylenteriaminepentaacetic acid
fMRI	Functional Magnetic Resonance

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Introduction

For many years the realm of choise for most anesthesiologists has been the operating room. However, because of recent advances in other medical practices we have seen an exponential growth in the need for anesthesia sources outside of the operating room.***(Missant C, Van de velde M,2008)***.

Many intervensions develop the anesthesia outside the operating room such as:

Radiology suites, interventional radiology, magnetic resonance imaging, Computed tomography, Ultrasound, Cardiac catheterization and electrophysiology, Endoscopy suite Emergency room, Out patient (dentists) Critical care units. When providing care at such locations, anesthesiologists must maintain the same high standard of anesthetic care provided in the operating suit. The anesthetizing location must be surveyed by the anesthesiologist to determine whether anesthetic care can be delivered safely in that location before delivery of that care. ***(Eichorn JH and Cooper JB,,2009)***

Anaesthesiology is the key specialty in medicine to take up responsibility for achieving the goals listed in HELSINKI Declaration of patient safety ***(Mellin-Olsen J, and O'Sullivan E, 2007).***

- Patients have a right to expect to be safe and protected from harm during their medical care and anesthesiologist has a key role to play improving patient safety perioperatively.

- Patients have an important role to play in their safe care which they should be educated about and given

opportunities to provide feedback to further improve the process for others.

- Education has a key role to play in improving patient safety, and we fully support the development, dissemination and delivery of patient safety training.

- Human factors play a large part in the delivery of safe care to patients, and we will work with our surgical, nursing and other clinical partners to reliably provide this.

- Anaesthesiology has been a key specialty in medicine leading the development of patient safety. We are not complacent and know there are still more areas to improve through research and innovation.

(Mellin-Olsen J, and O'Sullivan E, 2007).

Aim of the Work

To highlight the procedures that need anesthesia outside the OR and ensure the presence of standard monitors to allow patient safety.

Preoperative Evaluation, Monitoring of Patient and Anesthetic Techniques Outside Operation Room

Preoperative evaluation and optimization of medical status of patients are important components of anaesthesia practice. Increased numbers of patients with serious comorbidities undergo procedures outside the operating room as in Radiology suites (Interventional radiology as angiography Magnetic resonance imaging Computed tomography), Ultrasound, Endoscopy suite, Emergency room Outpatient procedure rooms (dermatologists, dentists. Often the location alters the challenges of caring for these patients. Surgical, anaesthesia, or nursing personnel who can assist with airway and resuscitation management may not be available; equipments and medications may be limited, Yet patients and / or providers may be reluctant to expend time and energy in extensive preoperative evaluation before seemingly minor procedure ***(Girish et al.,2001)***.

Preoperative evaluation

The guidelines of the American Society of Anesthesiologists (ASA) indicate that a pre-anesthesia visit should include the following:

1. Interview with the patient to review medical, anesthesia, and medication history.

2. Appropriate physical examination

3. Review of diagnostic data (laboratory, electrocardiograms, radiographs)

4. Assignment of ASA physical status score.

5. Formulation and discussion of anesthesia plan with patient or responsible adult.

(Longnecker, 2008).

Medical History:

The patient's medical problems, past operations, previous anesthesia-related complications, allergies, and use of tobacco, alcohol, or illicit drugs should be documented. Equally important to identify the presence of a disease is establishing the severity, the stability, and prior treatment of the condition. A screening review of systems needs special emphasis on airway abnormalities, personal or family history of adverse events related to anesthesia, and cardiovascular, pulmonary, endocrine, or neurologic symptoms. ***(Eagle et al., 2005)***.

Physical Examination:

The pre-anesthetic examination should include the airway, a heart and lung examination, vital signs, including oxygen saturation, and height and weight. Body mass index (BMI) is one of many factors associated with development of chronic diseases such as heart disease, cancer, and diabetes. ***(Longnecker,2008)***.

Components of the airway examination should include the following:

- Length of upper incisors
- Condition of the teeth
- Relationship of upper (maxillary) incisors to lower (mandibular) incisors
- Ability to protrude or advance lower (mandibular) incisors in front of upper (maxillary) incisors

- Interincisor or intergum (if edentulous) distance
- Visibility of uvula
- Compliance of mandibular space
- Thyromental distance
- Length of neck
- Thickness of neck
- Range of motion of head and neck.

*(**American Society of Anesthesiologists, 2003**).*

Auscultation of the heart and inspection of the pulses, peripheral veins, and extremities for the presence of edema are important diagnostically and for risk assessment in development of care plans. One should auscultate for murmurs, rhythm disturbances, and signs of volume overload. The pulmonary examination should include auscultation for wheezing, decreased or abnormal breath sounds, notation of cyanosis or clubbing, and effort of breathing. Observing whether the patient can walk up 1–2 flights of stairs can predict a variety of postoperative complications, including pulmonary and cardiac events, and aid in decisions regarding the need for further specialized testing such as pulmonary function tests (PFTs) or noninvasive cardiac stress testing. Obesity, and large neck circumference predict an increased incidence of obstructive sleep apnea (OSA). ***(Girish et al., 2001).***

Preoperative Testing:

Preoperative testing is performed to evaluate existing medical conditions and to diagnose asymptomatic conditions based on known risk factors for particular diseases. Diagnostic tests can aid in the assessment of the risk of anesthesia and operation, guide medical intervention to lower this risk, and provide baseline results to direct intra- and postoperative decisions. ***(O'Connor & Drasner, 1990).***

Preoperative diagnostic testing standard order:

CBC, W/Plt, BUN / Creat, glucose. ***(Longnecker, 2008)***

High-Risk patient:

Here is a brief review of some conditions commonly seen in the pre anesthetic assessment clinic and for which preoperative intervention is important.

1.Ischemic Heart Disease:

The goals in the pre-anesthetic encounter are to Identify the risk of heart disease based on co morbid diseases.

- Identify the presence and severity of heart disease from symptoms, physical findings, or diagnostic tests.
- Determine the need for preoperative interventions.
- Modify the risk of preoperative adverse events.

The basis of cardiac assessment is the history, the physical examination, and ECG. ***(Eagle et al., 2005)***.

Clinical predictors, functional or exercise capacity, and level of surgical risk guide further diagnostic and therapeutic interventions. Exercise tolerance is indicated for patients with normal ECGs who can exercise pharmacological tests, such as dobutamine echocardiography or nuclear perfusion imaging, are necessary for those unable to exercise or who have significant ECG abnormalities that interfere with the interpretation of ischemia via ECG. The American Heart Association / American College of Cardiology Task Force on preoperative evaluation of the cardiac patient Undergoing Non-Cardiac surgery has defined three risk groups+ major, intermediate, and minor (Table 1). They indicate the recent MI (MI< 30 days) places patients in the group at high risk;