

Preoperative Intraoperative and Postoperative assessment

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Anesthesiologist Duties and Responsibilities

- **Evaluate** patients to formulate an adequate anesthetic plan.
- **Manage** and administer anesthesia during surgical procedures.
- **Record** patient medical history and anesthetic amounts.

- Monitor, manage, and treat changes in patient functions during operations, including

breathing,

heart rate,

blood pressure.

- Monitor conditions of patients

- before,

- during, and

- after anesthesia

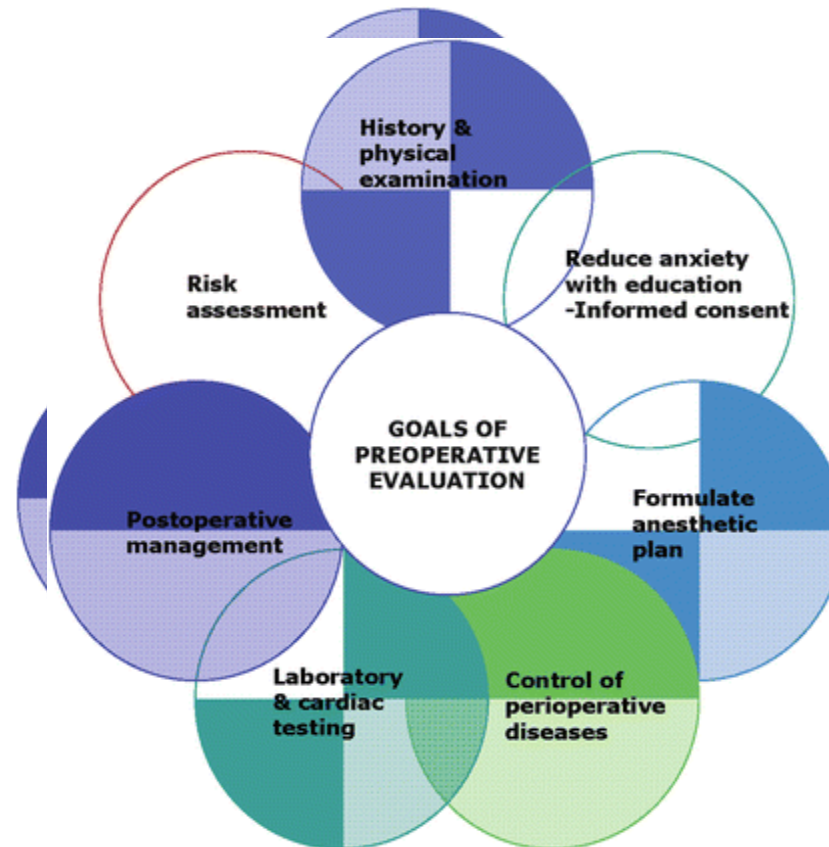
Preoperative assessment



Definition

The process of clinical assessment that precedes the delivery of anaesthesia care

Preparing a patient for anaesthesia requires an understanding of the **patient's pre-operative status**, the **nature of the surgery** the **anaesthetic techniques** required for surgery and **the risks a particular patient may face during this time**.



Objectives

- Evaluate the patient's medical condition
- Optimise the patient's medical condition for anaesthesia and surgery.
- Determine and minimise risk factors for anaesthesia.
- Plan anaesthetic technique and perioperative care.
- Develop a rapport with the patient to reduce anxiety and facilitate conduct of anaesthesia.
- Inform and educate the patient about anaesthesia, perioperative care and pain management
- Obtain informed consent for anaesthesia

Preoperative Evaluation

- ❖ Anesthetic drugs and techniques have profound effects on human physiology. Hence, a focused review of all major organ systems should be completed prior to surgery.
- ❖ Goals of the preoperative evaluation is to ensure that the patient is in the **best** (or optimal) **condition**.
- ❖ Patients with unstable symptoms should be postponed for optimization prior to elective surgery.



Steps of the preoperative visit :

I. Problem Identification

II. Risk Assessment

III. Preoperative Preparation

IV. Plan of Anesthetic Technique



- **Elective operation** should be performed under optimal condition with full physical and psychological preparation of a fully informed patient.
- **Emergency operation** may have to be done in less than ideal circumstances .

I. Problem Identification

- **Cardiovascular** : hypertension ; ischemic , valvular or congenital heart disease; CHF or cardiomyopathy, , arrhythmias
- **Respiratory** : smoking; COPD; restrictive lung disease; altered control of breathing (obstructive sleep apnea, CNS disorders, etc.)
- **Neuromuscular** : raised ICP ; TIA's or CVA's; seizures; spinal cord Injury; disorders of NM junction e.g myasthenia gravis, muscular dystrophies ,MH
- **Endocrine** : DM; thyroid disease; pheochromocytoma; steroid therapy
- **GI - Hepatic** : hepatic disease; gastresophageal reflux
- **Renal** : renal failure
- **Hematologic** : anemias; coagulopathies
- **Elderly , Children, Pregnancy**
- **Medications and Allergies**
- **Prior Anesthetics**
- **Related to Surgery** : significant blood loss; respiratory compromise; positioning



I. Problem Identification

through :

- **History** (including a review of the patient's chart)
- **Physical examination**
- **laboratory investigation**



The History

The history is the most important component of the preoperative evaluation.

The history should include

- a past and current medical history,
- a surgical history,
- a family history,
- a social history (use of tobacco, alcohol and illegal drugs),
- a history of allergies, current and recent drug therapy, unusual reactions or responses to drugs and any problems or complications associated with previous anesthetics

History

A family history of adverse reactions associated with anesthesia should also be obtained.

In children, the history should also include birth history, focusing on risk factors such as prematurity at birth, perinatal complications and congenital chromosomal or anatomic malformations and

history of recent infections, particularly upper and lower respiratory tract infections.

The history should include

a complete review of systems to look for undiagnosed disease or inadequately controlled chronic disease.

Diseases of the cardiovascular and respiratory systems are the most relevant in respect of fitness for anesthesia and surgery



Physical Examination:

❖ General & Local examination

❖ Should focus on evaluation of :

- Upper airway
- Respiratory system
- Cardiovascular system
- other systems' problems identified from the history



Physical examination

The physical examination should build on the information gathered during the history.

At a minimum, a focused preanesthesia physical examination includes an assessment of **the airway, lungs** and **heart**, with documentation of vital signs

Unexpected abnormal findings on the physical examination should be investigated before elective surgery

Predictors of difficult intubation (4 M)

Mallampati

Measurements 3-3-2-1 or 1-2-3-3 Patient 's fingers

Movement of the Neck

Malformations of the **S**kull

Teeth

Obstruction

Pathology



Mallampati Score

Sensitivity: 44% - 81%

Specificity: 60% - 80%

- Roughly corresponds to Cormack and Lehane's laryngoscopy views
 - *Class I (easy)*—visualization of the soft palate, fauces, uvula, and both anterior and posterior pillars
- *Class II*—visualization of the soft palate, fauces, and uvula
- *Class III*—visualization of the soft palate and the base of the uvula
- *Class IV (difficult)*—the soft palate is not visible at all



Class I



Grade I



Class II



Grade II



Class III



Grade III



Class IV



Grade IV



Class 1



Class 2



Class 3



Class 4

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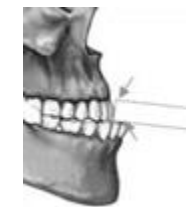
Measurements 3-3-2-1

3 Fingers Mouth Opening

3 Fingers Hypomenal Distance. (3 Fingers between the tip of the jaw and the beginning of the neck (under the chin))

2 Fingers between the thyroid notch and the floor of the mandible (top of the neck)

1 Finger Lower Jaw Anterior subluxation



Malformation of the skull

Skull (Hydro and Microcephalus)

Teeth (Buck, protruded, & loose teeth. Macro and Micro mandibles)

Obstruction (obesity, short Bull Neck & swellings around the head and neck)

Pathology (Craniofacial abnormalities & Syndromes e.g. Treacher Collins, Goldenhar's, Pierre Robin syndromes)

“Patients with an abnormal airway (including Class III or IV airway) should be considered at higher risk “.



Movement of the Neck







Treacher Collins
(mandibulofacial dysostosis)





Bird Faces



Pierre Robin

(hypertelorism; and external and middle ear deformities)





Goldenhar's
(oculoauriculovertebral dysplasia)



Preoperative Laboratory Testing:

only if indicated from the preoperative history and physical examination.

"Routine or standing" pre operative tests should be discouraged

-**CBC** anticipated significant blood loss, suspected hematological disorder (eg.anemia, thalassemia, SCD), or recent chemotherapy.

-**Electrolytes** diuretics, chemotherapy, renal or adrenal disorders

-**ECG** age >50 yrs ,history of cardiac disease, hypertension, peripheral vascular disease, DM, renal, thyroid or metabolic disease.

-**Chest X-rays** prior cardiothoracic procedures ,COPD, asthma, a change in respiratory symptoms in the past six months.

-**Urine analysis** DM, renal disease or recent UTI.

-tests for different systems according to history and examination



II. Risk Assessment

Components for evaluating perioperative risk:

- patient's medical condition preoperatively
- extent of the surgical procedure
- risk from the anesthetic

“Most of the work, however, addresses the operative risk according to the patient's preoperative medical status”



Perioperative risk assessment

Perioperative risk is a function of the preoperative medical condition of the patient, the invasiveness of the surgical procedure and the type of anesthetic administered.

- **American Society of Anesthesiologists' Classification of Physical Status**

<i>Status</i>	<i>Disease State</i>
ASA class 1	No organic, physiologic, biochemical, or psychiatric disturbance
ASA class 2	Mild to moderate systemic disturbance that may or may not be related to the reason for surgery <i>Examples:</i> Heart disease that only slightly limits physical activity, essential hypertension, diabetes mellitus, anemia, extremes of age, morbid obesity, chronic bronchitis
ASA class 3	Severe systemic disturbance that may or may not be related to the reason for surgery, <i>(does limit activity)</i> <i>Examples:</i> Heart disease that limits activity, poorly controlled essential hypertension, diabetes mellitus with vascular complications, chronic pulmonary disease that limits activity, angina pectoris, history of prior myocardial infarction
ASA class 4	Severe systemic disturbance that is life-threatening with or without surgery <i>Examples:</i> Congestive heart failure, persistent angina pectoris, advanced pulmonary, renal, or hepatic dysfunction
ASA class 5	Moribund patient who has little chance of survival but is submitted to surgery as a last resort (resuscitative effort) <i>Examples:</i> Uncontrolled hemorrhage as from a ruptured abdominal aneurysm, cerebral trauma, pulmonary embolus.
ASA class 6	A declared brain-dead patient whose organs are being removed for donor purposes
E	An "E" is added to the status number to designate an emergency operation

Fasting preoperative time

Liquid and Food Intake	Minimum Fasting Period (hours)
Clear liquids (for example, water, clear tea, black coffee, carbonated beverages, and fruit juice without pulp)	2
Breast milk	4
Nonhuman milk, including infant formula	6
Light meal (for example, toast and clear liquids)	6
Regular or heavy meal (may include fried or fatty food, meat)	8

III. Preoperative Preparation

- **Anesthetic indications:**

- Anxiolysis, sedation and amnesia. e.g. benzodiazepine(diazepam ,lorazepam)
- Analgesia e.g narcotics
- Drying of airway secretions e.g atropine,glycopyrrolate,scopolamine
- Reduction of anesthetic requirements ,Facilitation of smooth induction
- Patients at risk for GE reflux :ranitidine ,metoclopramide , sodium citrate

- **Surgical indications:**

- Antibiotic prophylaxis for infective endocarditis.
- Prophylaxis against DVT for high risk patients : low-dose heparin or aspirin intermittent calf compression, or warfarin.

- **Co-existing Disease indications:**

Some medications should be continued on the day of surgery e,g B blockers, thyroxine. Others are stopped e.g oral hypoglycemics and antidepressants . Steroids within the last six months may require supplemental steroids



IV. Plan of Anesthetic Technique

1. Is the patient's condition optimal?
2. Are there any problems which require consultation or special tests?
“Please assess and advise “
3. Is there an alternative procedure which may be more appropriate?
4. What are the plans for postoperative management of the patient?
5. What premedication if any is appropriate?



Finally, we plan our anesthetic technique :

1. Local or Regional anesthesia with 'standby' monitoring with or without sedation.
2. General anesthesia; with or without intubation. Spontaneous or controlled ventilation is used.
3. Combined regional with general anesthesia.



Intraoperative care is patient care during an operation

Activities such as monitoring the patient's vital signs , blood oxygenation levels, fluid therapy, medication transfusion, anesthesia, radiography, and retrieving samples for laboratory tests, are examples of **intraoperative care**.



Intraoperative monitoring: Introduction

The FOUR BASIC Monitors:

- We are NOT authorised to start a surgery in the absence of any of these monitors:
 - ECG.
 - SpO₂: arterial O₂ saturation.
 - Blood Pressure: NIBP (non-invasive), IBP (invasive).
 - ± [Capnography].
- The most critical 2 times during anesthesia are: **INDUCTION - RECOVERY.**
- Exactly like "*flying a plane*" induction (= take off) & recovery (= landing). The aim is to achieve a smooth induction & a smooth recovery & a smooth intraoperative course.

7- Monitoring During anaesthesia



❖ Monitors :

- a) non-invasive blood pressure
- b) ECG
- c) pulse oximetry capnography (CO₂ monitor) and oxygen analyzer
- d) Temperature probe nerve stimulator

❖ Specialized monitors :

- a) arterial line (invasive blood pressure)
- b) central venous line (cvp monitoring)
- c) pulmonary artery flotation catheter (monitors function of right and left side of the heart)
- d) BIS monitor (depth of anaesthesia)



Monitoring Depth of Anaesthesia



Over-sedated or under-sedated?

- Some 26,000 patients awoken during surgery under general anaesthesia

Entropy

RE **35**
SE **34**



Calculating blood loss in theatre:

1. Weigh a dry **swab**.
2. Weigh blood soaked swabs as soon as they are discarded and subtract their dry weight (1ml of blood weighs approximately 1gm).
3. Subtract the weight of empty **suction bottles** from the filled ones.
4. Estimate blood loss into surgical **drapes**, together with the pooled blood **beneath the patient** and onto the **floor**.
5. Note the volume of **irrigation fluids**, subtract this volume from the measured blood loss to estimate the final blood loss.

Postoperative care

The management of a patient after surgery .

- This includes care given during the immediate postoperative period , both in the operating room and postanesthesia care unit (PACU), as well as during the days following surgery .
- The goal of postoperative care :
 - to prevent complications such as bleeding,
 - to promote healing of the surgical incision,
 - and to return the patient to a state of health.

Postoperative care has three phases

- Immediate post-op care (Recovery phase)
- Care in the ward
- Continued care after discharge from the hospital

Discharge from the theatre . Anesthetic and surgical staff should record the following items in the patients case notes:

- Any anesthetic, surgical or intraoperative complications.
- Any specific treatment or prophylaxis required(eg: fluids, nutrition, antibiotics , analgesia , anti-emetic , thromboprophylaxis)

Postanesthesia care unit (PACU)

- The patient is transferred to the PACU after the surgical procedure, anesthesia reversal, and extubation (if it was necessary).
- The amount of time the patient spends in the PACU depends on the length of surgery, type of surgery, status of regional anesthesia (e.g., spinal anesthesia), and the patient's level of consciousness. Rather than being sent to the PACU, some patients may be transferred directly to the critical care unit.

Postoperative Handover Proforma

Patient Information	Recovery
1. Patient Name & Age	
2. Medical History	
3. Allergy Status	
4. Name of Procedure	
5. Current status of the patient	
Anaesthetic Information	
6. Type of Anaesthesia	
7. Intraoperative anaesthetic course & any complications	
8. Anticipated Postoperative problems especially bleeding, pain and airway problems	
9. Monitoring & Range for Physiological parameters eg BP, Urine output	
10. Analgesia plan	
11. Plan for IV fluids	
12. Postop Investigations	
13. Contact number of person in case of anaesthetic problems	
Surgical Information	
14. Intraoperative surgical course & any complications	
15. Blood loss	
16. Antibiotic Plan	
17. Medication plans- Drugs to be restarted	
18. DVT prophylaxis	
19. Plan for tubes and drains	
20. NG tube & feeding plan	
21. Postop Investigations	
22. Contact number for any surgical problems	

Assessment Postanesthesia care unit (PACU)

- airway patency + respiratory status , vital signs , and level of consciousness

Other assessment categories:

- surgical site (intact dressings with no signs of overt bleeding)
- patency (proper opening) of drainage tubes/drains
- body temperature (hypothermia/hyperthermia)
- patency/rate of intravenous (IV) fluids
- circulation/sensation in extremities after vascular or orthopedic surgery
- level of sensation after regional anesthesia
- pain status
- nausea/vomiting



Postoperative Care: *Later postoperative period*

Ongoing Assessment

- Respiratory function
- General condition
- Vital signs
- Cardiovascular function
- Fluid status
- Pain level
- Bowel and urinary elimination
- Dressings, tubes, drains, and IV lines