



Preoperative Anesthetic Assessment

Objectives:

- Learn pre-anesthetic patient evaluation and risk stratification.
- Obtain a full history and physical examination including allergies, current medications, past anesthetic history, family anesthetic history.
- Understand how patient comorbidities can affect the anesthetic plan.
- Be able to understand potential anesthetic options for a given surgical procedure.
- Be able to plan an anesthetic for a basic surgical procedure.
- Understand risk stratification of a patient undergoing anesthesia.
- The perioperative patient journey.

Color index:

•Red: important / •Black: content slides •Gray: extra •Green: dr. Notes





NCEPOD: Classification of intervention (National Confidential Enquiry into Patient Outcome and Death)

	Description	Example
Immediate	Life/Limb/Organ saving - Resuscitation occurs simultaneously with surgery - Surgery within minutes	- Rapid bleeding: trauma, ruptured aneurysm, blunt injury
Urgent	Life/Limb/Organ threatening - Surgery within hours	Perforated bowel or less urgent bleeding
Expedited	Early surgery - within a day or two	Large bowel obstruction, closed long bone fracture
Elective	Timing to suit patient and hospital	Joint replacement, unobstructed hernia repair, cataract

Overview: The preoperative visit



The Goal of Preoperative visit

The preoperative visit of all patients by anesthetist is an essential requirement for the safe and successful conduct of anaesthesia

Main aim is to assess the patient's fitness for anesthesia. The best to be performed by an anesthetist, preferably the one who is going to administer the anesthetic.

The goal of preoperative visit:



Preoperative visit:



Anesthetic history And Examination:

Previous anesthetics and operations:

- Hospitals.
- Enquire about inherited or 'family' diseases: sickle-cell disease, porphyria.
- Difficulties with previous anesthetics

Difficulties with previous anesthetics



Present and past medical history:

- All the aspects of the patient's medical history.
- Relating to the cardiovascular and respiratory systems and its severity.



Specific inquiries must be made about:

- 1. Angina: Incidence, Precipitating factors, Duration, Use of antianginal medications, e.g. glyceryl trinitrate (GTN) oral or sublingual.
- 2. Previous myocardial infarction and subsequent symptoms.
- 3. Symptoms indicating heart failure: Heart failure will be worsened by the depressant effects impairing the perfusion of vital organs ¹
- 4. Myocardial infarction are at a greater risk of perioperative reinfarction
- 5. Elective surgery postponed until at least 6 months after the event
- 6. Untreated or poorly controlled hypertension (diastolic consistently > 110 mmHg) may lead to exaggerated cardiovascular responses.
- 7. Both hypertension and hypotension can be precipitated → which increase the risk of myocardial ischemia.
- 8. Valvular heart disease: prosthetic valves may be on anticoagulants, need to be stopped or changed prior to surgery and give Antibiotic prophylaxis²

Active cardiac condition	Minor cardiac condition
Unstable coronary syndromes (severe or unstable angina, recent MI)	Advanced age >70
Decompensated CHF	Abnormal ECG:
Significant arrhythmia or heart block. Affect hemodynamic of the pt, induce severe chest pain/mental status.	 LV hypertrophy LBBB ST-T abnormalities Rhythm other than sinus
Severe aortic or mitral valvular disease (AS<1.0 cm; mean gradient 40 mmHg; symptomatic mitral or aortic disease)	Uncontrolled systemic hypertension

Anesthesia Inquiries in history





Cardiovascular MET Estimation:

METs	Exercise	Recreation	Work/Household Activities
1.5-2.0 METs	Slow walk 40-60 min mile	Watching TV Playing Cards	- Desk work - Light house work - Making bed - Brushing hair/teeth
2.0-3.0 METs	Walking 24-30 min mile Cycling level 5 mph	Golf with power cart Play musical instrument	- Driving car - Cooking / washing dishes - Ironing / sweeping - Showering
3.0-4.0 METs	Walking 20 min mile Cycling 5.5 mph	Bowling Billiards Golf with pull cart Shopping	- Janitorial work - Vacuuming / Kneeling - Climbing stairs slowly - Sexual intercourse
4.0-5.0 METs	Walking 15-17 min mile Cycling 8 mph	Dancing Gardening Golf carrying clubs	- Painting house - Carrying 20-40 [bs - Raking leaves - Shoveling snow
5.0-6.0 METs	Walking 13-15 min mile Cycling 10 mph	Canoeing Stream Fishing Baseball	- Carpentry - Shoveling heavier snow



Patients with pre-existing lung disease:

- Prone to postoperative chest infections if they are obese or undergoing upper abdominal or thoracic surgery
- Chronic obstructive lung disease: sputum production (volume and color), Dyspnea.
- Bronchial Asthma, including precipitating factor and last attack, previous hospital admission.
- Upper respiratory tract infection (anaesthesia and surgery should be postponed at least 2 weeks, unless it is for a life-threatening condition).
- COVID swab for all suspected patient².



GI system ³

- Indigestion and GERD reflux.
- Heartburn (may indicate the possibility of a hiatus hernia)

1- Any Pt with COPD, severe asthma, bronchiectasis should be referred to a pulmonologist to optimize their condition before going to surgery

2- Done for all patients NOT only suspected.

3- Those conditions (GERD, hiatal hernia) will aspirate gastric content so we do modified rapid induction to shorten the time of anesthesia induction thus secure airway and prevent aspiration

Anesthesia Inquiries in history cont..



Anothetic latery

What is the symptoms of rheumatoid diseases that are very important for preoperative assessment?

(1) Chronically anaemic¹.

(2) Severely limited movement of their joints \rightarrow (3) makes positioning for surgery and airway maintenance difficult.

(4)Tendency for dislocation of atlanto-occipital joint ².

Diabetes

- Patients have an increased incidence of:
 1- Ischaemic heart disease. 2- Renal dysfunction. 3-Autonomic and peripheral neuropathy
- Intra- and postoperative complications.



Neuromuscular disorders

- Care with muscle relaxants³.
- Coexisting heart disease.
- Restrictive pulmonary disease



Chronic renal failure

- Anaemia
- Electrolyte abnormalities ⁴
- Altered drug excretion ⁵
- Restricts the choice of anaesthetic agents



Liver disease ⁶

- Infectious or obstructive liver disease
- Altered drug metabolism
- Altered coagulation function.



Epilepsy

- Well controlled or not, compliance to medication.
- Avoid anaesthetic agents potentially epileptogenic (e.g. enflurane, ketamine).
- Predict convulsions which induced by withdrawal effects of anesthesia drugs ⁷



Drug history and allergies

- Identify all medications: 1- Prescribed. 2- Self-administered.
- Allergies to drugs: Topical preparations (e.g. iodine), Adhesive dressings, Foodstuffs.

1- Can mask cardiac disease

4- Hyperkalemia, hyponatremia and acidosis

6- FFP prescription, they have tendency for bleeding

²⁻ During intubation do not flex the patient's head

³⁻ We give small small doses of muscle relaxant succinylcholine if indicated because it may induce malignant hyperthermia

⁵⁻ e.g. recronium is a muscle relaxant, if it's secretion is prolonged the Pt will be paralyzed for longer time

⁷⁻ We have to be prepared in the recovery room for convulsions, if it happened give diazepam

Anesthesia Inquiries in history cont..



Social history

- Smoking: (Number of cigarettes, amount of tobacco). Nicotine stimulates the sympathetic nervous system causing: tachycardia, hypertension and coronary artery narrowing.
- Alcohol: (Induction of liver enzymes, tolerance)
- Addiction: Difficulty with venous access, Thrombosis of veins and Withdrawal syndromes)
- Look for tattooing.¹

Pregnancy

- Increased risk of regurgitation and aspiration.
- Elective surgery is best postponed until after delivery.

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Obesity

- Cardiovascular, Respiratory, Sleep apnea and snoring, Diabetics, Fatty liver.
- Technical problem: Airway, aspiration, intravenous access and positioning.

The examination

Cardiovascular system:

- Dysrhythmias: Atrial fibrillation.
- Heart failure².
- Valvular heart disease: heart murmur.
- Blood pressure is best measured at the end of the examination.

Nervous system:

- Chronic disease of the peripheral and central nervous system.
- Evidence of motor or sensory impairment should be documented.



Respiratory system:

- Cyanosis ³
- Pattern of ventilation
- Respiratory rate
- Dyspnoea⁴
- Wheeziness ⁴
- Signs of collapse
- Consolidation and effusion

Musculoskeletal system:

- Restriction of movement and deformities
- Reduced muscle mass
- Peripheral neuropathy
- Pulmonary involvement
- Particular attention to the patient's cervical spine ⁵ and temporomandibular joints

- 2- You have to auscultate looking for tachycardia, S3, S4 and basal crepitation.
- 3- Indicate very low oxygen saturation "emergency"
- 4- Should be treated before surgery
- 5- Especially with rheumatoid arthritis patients will have subluxation.

¹⁻ Sometimes it accompanied with hepatitis C or HIV





Examining the airway:

- Try and predict difficult intubation.
- Assessment is often made in three stages



Observation of the patient's anatomy: Look for:



Airway evaluation:

Take very serious history of prior difficulty.

Head and neck movement (extension).



Alignment of oral, pharyngeal, laryngeal axes

Jaw Movement:





Receding Mandible: Inability to sublux lower incisors beyond upper incisors

Protruding Maxillary Incisors (buck teeth)

Cervical spine arthritis or trauma,

burn, radiation, tumor, infection,



Laryngoscopy view: Cormack and Lehane:

1- Grade I: complete glottis visible 2- Grade II: anterior glottis not seen 3- Grade III: epiglottis seen, but not glottis4- Grade IV: epiglottis not seen







Baseline examinations

If no concurrent diseases, investigations can be limited to:

Age	Sex	Investigations
<40	Male	Nill
<40	Female	Hb.
41-60	Male	ECG, blood sugar, creatinine
41-60	Female	Hb, ECG, blood sugar, creatinine
>61	All	Hb, ECG, blood sugar, creatinine

Additional investigations



Medical referral:

Acceleric husy Special investigation Speci

Optimization of coexisting medical (or surgical) problems may mean postponing surgery

Cardiovascular disease:

- Untreated or poorly controlled hypertension or heart failure.
- Symptomatic ischaemic heart disease (unstable angina).
- Dysrhythmias: uncontrolled atrial fibrillation, paroxysmal
- supraventricular tachycardia, second and third degree heart block.
- Congenital heart disease or symptomatic valvular heart disease.

Respiratory disease:

- Chronic obstructive airways disease, if dyspnoeic at rest.
- Bronchiectasis.
- Asthmatics: 1. Unstable 2. Taking oral steroids 3. have a FEV1 < 60% predicted.



Renal disease:

- Chronic renal failure. Patients undergoing chronic dialysis
 - Endocrine disorders:
 - Insulin and non-insulin dependent diabetics.
- Ketonuria.
- Random blood sugar > 12 mmol/L
- Cushing's.
- Addison's disease
- Hypopituitarism

Hypo- or hyperthyroidism.

Hematological disorders:

- Bleeding diathesis: haemophilia, thrombocytopenia.
- Therapeutic anticoagulation
- Haemoglobinopathies.
- Polycythaemia.
- Haemolytic anaemias.
- Leukaemias.



One third of deaths are preventable.



Anaesthetic associated death:

- Increasing age: >60 years. -
- Sex: male > female. 🦃
- Worsening physical status.
- Increasing number of concurrent medical conditions, in particular: myocardial infarction and _ diabetes mellitus.
- Renal disease
- Increasing complexity of surgery: intracranial, major vascular and intrathoracic.
- Increasing length of surgery. -
- Emergency operations.

Causes in order of frequency:

- 1- Inadequate patient preparation.
- 2- Inadequate postoperative management.
- 3- Wrong choice of anaesthetic technique.
- 4- Inadequate crisis management.





ASA (American Society of Anesthesiologists) Grading:

ASA PS classification	Definition	Example, including, but not limited to
ASA I	A normal healthy patient	Healthy, non-smoking, minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity (30 <bmi<40), dm="" htn,="" lung<br="" mild="" well-controlled="">disease</bmi<40),>
ASA III	A patient with severe systemic disease	Substantive functional limitation; one or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM/HTN, COPD, morbid obesity (BMI =>40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA<60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (<3 months) MI, CVA, TIA, or CAD/stents, ongoing cardiac ischemic or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purpose	

The addition of "E" denotes Emergency surgery: (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part)

Informing the patient and consent:



Informing the patient

• The choice of anaesthetic technique rests with the anaesthetist, but most patients appreciate some details of what to expect.



- Patients will ask about their immediate recovery.
- Finally:
 - 1. Reassure patients about postoperative pain control.
 - 2. Informed of the technique.
- Consent for anaesthesia.

Consent form

- Anaesthetic consent is an important aspect of operative consent.
- All patients should have received written information in advance as well as an explanation of side effects

explanation of side effects:



• Consent must be obtained before any sedating , premedication is given



- 1. Ability to understand and retain information about the treatment.
- 2. Ability to weigh up the information.
- 3. Ability to make a free choice.





NPO Guidelines for elective sedation:

Ingested

Time

Clear liquids (water, fruit juices w/o pulp, carbonated beverages, clear tea, black coffee)	2 hours
Breast milk	4 hours
Infant formula	6 hours
Nonhuman milk (similar to solids)	6 hours
Solids (light meal; if includes fatty/fried food, consider longer faster period)	6 hours

* In emergency situation, carefully weigh the need for immediacy with increased risk of pulmonary aspiration. Use lightest effective sedation possible.

Patients at risk of gastric aspiration even after fasting:



Premedication



The 6As of Premedication:



Anxiolysis:

- The best anxiolytic is the anesthetist who visits the patient and
- listens to the patient.
- Benzodiazepines | Phenothiazines.



Amnesia:

Lorazepam | anterograde amnesia.



Antiemetic:

Dopamine antagonists| Antihistamines | Anticholinergics | Phenothiazines | 5-hydroxytryptamine antagonists | a2- agonists: clonidine, Dex.



Antacid:

- Patients who have received opiates.
- Present as emergencies.
- If in pain
- Delayed gastric emptying.
- Hiatus hernia
- Drugs: Oral sodium citrate, Ranitidine, Proton inhibitors¹, Metoclopramide, naso- or orogastric tube.



Anti-autonomic²: given to patients have parasympathetic reflexes.

- Excessive vagal activity causing profound bradycardia.
- Halothane.
- 2nd dose of Suxamethonium.
- Surgery.
- Traction on the extraocular muscles.
- Handling of the viscera.
- During elevation of a fractured zygoma.



Analgesic

e.g. omeprazole
 e.g. hyoscine and glycopyrronium

Post-operative stage



Second: Receive supplemental oxygen during transfer

- Third: Many patients who do not have a general anesthesia/sedation bypass the recovery room and go straight from the operating theatre
 - Examples include local anesthesia cases (e.g. minor surface surgery, cataract removal, some regional anesthesia cases).

Once in the recovery room:

Handover occurs between the anesthetist and a recovery nurse. Important information passed on includes:



Question 1: Regarding preoperative management of the high-risk patient, which of the following statements are true?

- A. A course of antibiotics should always be given in patients with chronic sputum production.
- B. Stopping smoking prior to surgery is of little benefit.
- C. Oral medications can still be given with a little water in patients who are nil-by-mouth.
- D. A course of steroids prior to surgery may be necessary in patients with chronic obstructive airways disease.

Question 2: Regarding consent for surgery, which of the following are true?

- A. Children below the age of 16 years cannot give consent
- B. A social worker can give consent for a child under a care order
- C. All minor complications with an incidence above 1% should be discussed
- D. Consent is not required for life-saving surgery in a competent patient
- E. Two senior doctors need to sign the form explaining reasons for actions if an adult is deemed not competent to consent

Question 3: Which of the following statements regarding preoperative management of specific medical problems are true?

- A. Patients with a diastolic pressure above 95 mmHg should have their elective operations postponed.
- B. Elective surgery should be delayed until at least 1 year after a myocardial infarction (MI).
- C. There is no need to control tachyarrhythmias preoperatively.
- D. Preoperative transfusion should be considered if the Hb level <10 g/dL.
- E. In patients with malnutrition, preoperative nutrition therapy should be started 2 weeks prior to surgery

Question 4: Regarding sedation during endoscopy, which of the following statements are false?

- A. Sedation has no significant dangers and can be used without restrictions.
- B. All sedated patients require secure intravenous access.
- C. Co-administration of opiates and benzodiazepines has a synergistic effect.
- D. The use of supplementary oxygen is essential in all sedated patients.
- E. All sedated patients require pulse oximetry to monitor oxygen saturations

Question 5: Preoperative assessment of patients with diabetes mellitus should include:

- A. An assessment of functional status
- B. 24-Hour creatinine clearance
- C. Pulmonary function testing
- D. Cancellation of the surgical case if HbA1c >10%





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