TEAM ANESTHESIA

435

Preoperative Anesthetic Assessment and Premedication

{Color index: **Important** ★ | **Notes** | **Book** | **433 Notes** | **Extra** | **Editing File**}

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.
- The medical student will understand how patient comorbidities can affect the anesthetic plan.
- The medical student will be able to understand potential anesthetic options for a given surgical procedure.
- The medical student will be able to plan an anesthetic for a basic surgical procedure.
- The student will understand risk stratification of a patient undergoing anesthesia.
- The perioperative patient journey.

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Preoperative Anesthetic Assessment and Premedication

NCEPOD[1] classification of intervention (National Confidential Enquiry into Patient Outcome and Death)

★MCQs	Description	Example
Immediate	**Life/Limb/Organ saving** • Resuscitation occurs simultaneously with surgery. • Surgery within minutes.	• Rapid bleeding: Trauma, aneurysm. • Intra Abdominal or intrathoracic bleeding. • Venous Thromboembolism
Urgent	**Life/Limb/Organ threatening** • Surgery within hours.	• Perforated bowel or less urgent bleeding.
Expedited	• **Early surgery within day or two.**	• Large bowel obstruction, closed, long bone fracture.
Elective	• **Timing to suit** patient and hospital.	• Joint replacement, unobstructed hernia repair, cataract.

Most complications and increase mortality and morbidity cause by lack of preoperative assessment[2].

Overview: *The preoperative visit:*

- ➢ Anaesthetic history.
- ➢ Examination.
- ➢ Special investigations.
- ➢ Medical referral.
- ➢ Risk assessment.
- ➢ Informing the patient and consent.
- ➢ Premedication.

[1] There are various classifications of the **urgency of surgery**; the most common is the NCEPOD classification: The anesthetist has to ensure that the patient is made as well as they can be made prior to surgery. In *immediate* cases, there will be no time to effect improvement in the patient's condition beforehand, as resuscitation takes place simultaneously during surgery. *emergencies'* there are a few hours which can be well spent to reduce risk and improve outcome by careful treatment (vascular access, urinary catheter, nasogastric tube, i.v. fluids). With *elective* patients there is plenty of time to make the patient as well as they can be (e.g. treatment of hypertension or angina).

[2] In some cases it may be appropriate to refer the patients for other surgery irst (e.g. coronary revascularization or carotid surgery prior to, for example, a joint replacement).

The preoperative visit:

- The preoperative visit of all patients by anesthetist is an essential requirement for the safe and successful conduct of anesthesia.
- Main aim is **to assess the patient's fitness for anesthesia[3].**
- The Best to be performed by an **anesthetist**, preferably the one who is going to administer the anesthetic.

We need to determine;
1-Fitness of patient 2-Plan intra-& Post-operative
3-Pain management 4-Optimization 5-Airway

The Goal of Preoperative visit:

- To educate about anesthesia, perioperative care and pain management (most of the time the pt. is concerned about the postop pain) to reduce anxiety.
- To obtain patient's medical history and physical examination.
- To determine which lab test or further medical consultation are needed .
- To choose care plan guided by patient's choice and risk factors.

Visit allows	Coexisting illness
❏ Best anaesthetic technique. ❏ Any potential interactions between concurrent diseases. ❏ Anaesthesia anticipated and its possible complications. ❏ Provides an explanation. ❏ Recurrence for the patient.	❏ Improve the patient condition prior to surgery. ❏ Seeking advices from other specialties (make referral.). ❏ Optimise treatment.[4] ❏ Final decision. ❏ Should improve pt condition and which drugs should continue and which should stop

★Three situations where special arrangements are usually made:

1- Patients with **complex medical or surgical problems**[5]:	➢ Patient is often admitted several days before surgery and we have time to do all the investigations we need in anesthetic clinic. ➢ Anesthetist is actively involved in optimizing their condition prior to anesthesia and surgery.
2- Surgical **emergencies**:	➢ Only a few hours separates admission and operation in these patients urgent investigations or treatment. See the pt. quickly in the ward!
3- **Day-case** patients:	➢ These are patients who are planned come in the morning at 6, do surgery and leave at night at 4. ➢ **Generally 'fitter' ASA1**(have no medical condition) **or ASA 2** (have controlled medical condition). ➢ Assessment in anesthesia clinic **preoperative anesthesia clinic.** ➢ Such as a 21 y/o patient with left inguinal hernia.

[3] It's also going to guide your choice of the type of the anesthesia > like
1- pt. with bronchial asthma who's going for hernial repair, it's better to go with spinal anesthesia rather than GA.
2- pt. for total knee replacement > go with regional (epidural: bc it will provide postop analgesia and it will help the Pt for postop physiotherapy).
[4] Depending on the medical Hx of the pt. this might need multiple visits until reaching optimization of the pt. fitness for anesthesia
[5] Ex. colon cancer pt. With valvular disease and he is on many medication, admitted for 1 week > he should be seen by all the responsible specialities for his condition, and all of them should share the decision of his fitness to the operation with the anesthesiology team

Anesthetic history And Examination:

Anesthetist should take a **full history & Examine each patient**.

- **PREVIOUS ANAESTHETICS AND OPERATIONS:**
  - Hospitals.
  - Enquire about inherited or 'family' diseases: sickle-cell disease, porphyria, pseudocholinesterase deficiency[6], malignant hyperthermia.

Difficulties with previous anesthetics:

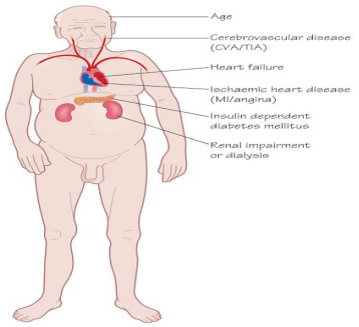
- Nausea, vomiting → they're common in females so if she had a history of such complication you should hydrate the pt and use multimodal antiemetics (good intraoperative fluid resuscitation to maintain perfusion)
- Dreams.
- Awareness: they will say they could hear the surgeons and anesthetists during the surgery but were completely paralyzed.(In short; Hear everything but can not move "Paralysed")
- Postoperative jaundice."hepatic injury"
- Postdural Puncture Headache.
- Present & past medical history:
  - All the aspects of the patient's medical history.
  - Relating to the cardiovascular and respiratory systems and its severity.

Anaesthesia enquiries in history:

1- Cardiovascular system

Patient factors associated with cardiac risk:

- Age.
- Heart failure (especially in pt. With decompensated HF[7]).
- Ischaemic heart disease (MI / angina > especially recent)
- Cerebrovascular disease (CVA / TIA)
- Insulin dependent diabetes mellitus.
- Renal impairment or dialysis.



Specific enquiries must be made about:

- Angina.
  - Incidence
  - Precipitating factors.
  - Duration.
  - Use of antianginal medications, e.g. glyceryl trinitrate (GTN) oral or sublingual)
- Previous myocardial infarction and subsequent symptoms.
- Symptoms indicating heart failure. we should refer the pt and treat him before OR!

[6] an inherited enzyme abnormality that results in abnormally slow metabolic degradation of exogenous choline ester drugs such as succinylcholine and mivacurium. Which leads to paralysis that lasts for 12 hours

[7] Anesthetizing such pt. might lead to his death on the table > that's why the preoperative assessment will affect the mortality rate

- ❏ Heart failure will be worsened by the depressant effects impairing the perfusion of vital organs

❏ Myocardial infarction are at a greater risk of perioperative reinfarction.

1- intraop. → any hypotension or hypertension will expose the pt. to MI.

2- postop. → must maintain good analgesia postoperatively to prevent tachycardia due to pain which might cause another MI.

❏ **Elective surgery postponed until at least 6 months[8] after the event(MI).** no matter what kind of anesthesia.

❏ Untreated or poorly controlled hypertension (diastolic consistently > 110 mmHg) may lead to exaggerated cardiovascular responses. Must wait at least 2 weeks after controlling it, may lead to intracerebral hemorrhage.

❏ Both hypertension and hypotension can be precipitated → which increase the risk of myocardial ischemia.

- Anesthetizing pt. with poorly controlled BP → the pt. will have fluctuations in his BP during anesthesia.
- During intubation with laryngoscope → severe heart depression → MI
- During induction of the anesthetic drug → pt. might have severe hypotension, bradycardia and he will arrest → due to the reverse in his hypertension he will have exaggerated response to the pain
- All HTN pt. have a high systemic vascular resistance → severe vasoconstriction → low CO, due to that any vasodilation (this effect by most anesthesia drugs) will lead to severe hypotension

❏ **Valvular heart disease:** prosthetic valves may be **on anticoagulants,** need to be stopped or changed prior to surgery and give **Antibiotic prophylaxis**.

- Patients on anticoagulants: Warfarin must be stopped 5 days before surgery and switched to heparin and heparin must be stopped 4 hours before surgery . Give pt antibiotic prophylaxis.
- You have to differentiate between **obstructive lesions and regurgitation** in of nonsurgical Rx **:**
  1. **Obstructive lesions: AS, MS and pulmonary HTN →** they easily decompensate → can't tolerate vasodilatation.
     - Ex. full term AS pt. for elective CS → you give her spinal anesthesia (it has severe vasodilating effect) → pt. will arrest !!
  2. **Regurgitation:** can't tolerate bradycardia. "Tolerate vasodilation effects of regional anaesthesia"

❏ We should do echo for cardiac patients.

❏ Renal impairment patients we should check (urea, creatinine, potassium level)

★Active Cardiac Conditions	★Minor Cardiac Predictors
➢ Unstable coronary syndromes: ● Unstable or severe angina. ● Recent MI"less than 6 months" or heart block. ➢ Decompensated HF. ➢ Significant arrhythmias. ➢ Severe valvular disease. Severe mitral or aortic diseases (AS <1.0 cm2, asymptomatic mitral or aortic diseases.)	➢ Advanced age (>70) ➢ Abnormal ECG: ● LV hypertrophy[9]. ● LBBB. ● ST-T abnormalities. ● Rhythm other than sinus ➢ Uncontrolled systemic hypertension. - **Doesn't** mean that the diastolic BP >110 - Even though, it should be controlled before the surgery).

[8] Some say 3 months

[9] In any pt. with hx of HTN, they will have ventricular hypertrophic changes on ECG ? bc there is increased contractile force of heart against high resistance

★MCQs★Surgical factors in assessment of risk of significant cardiac event:

- If a pt. With a cardiac disease and he is undergoing surgery , how we can assess the risk of that surgery ? We have risk factor from the surgery side and the cardiac problem side:
  - ➔ Ex. pt. Known of recent MI and he is undergoing cataract surgery:
    - He is having low risk from the surgery side
    - High risk from the cardiac status side.

Low risk <1%	Minor orthopaedic and urology: ● Gynaecology. ● Breast. ● Dental. ● Endoscopy, superficial procedures, Cataract and other ambulatory surgeries.
Intermediate 1-5%	Major orthopaedic and urology: ● Abdominal. Intraperitoneal or intrathoracic. ● Head and neck. Carotid. ● Prostate.
High risk[10] >5%	Aortic, major vascular: ● Peripheral vascular. ● Intraperitoneal/intrathoracic.

2- Respiratory system[11]

Patients with pre-existing lung disease:

- ➢ Prone to postoperative **chest infections** if they are **obese** or undergoing upper abdominal or thoracic surgery[12] with history of lung disease and sputum production (volume and color).
- ➢ Chronic obstructive lung disease sputum production (volume and color).
- ➢ Dyspnea.
- ➢ Bronchial Asthma, including precipitating factor and last attack, previous hospital admission.
  - Pt. with severe BA who suffers from many asthmatic attacks if you intubate him he will have severe bronchospasm → you can't extubate him, so in such case the right choice is to be far from a plan that needs intubation and ventilation and going with regional anesthesia.
- ➢ Upper respiratory tract infection (anaesthesia and surgery should be postponed "at least two weeksf ree of symptoms Preoperative" unless it is for a life-threatening condition).
  - Most of the cancelation of the surgeries are due to URI ?? (especially with the pediatrics)
    - ➔ With GA there is a high chance of transfering infection from URT to LRT
    - ➔ The area will be very sensitive → any instrumentation will lead to laryngospasm
- ➢ Any patient with BA or COPD should have chest physiotherapy before surgery.
- ➢ Pt. with bronchiectasis should take antibiotics.

[10] We have to optimize the pt. first.
[11] **Both infection and whether we can extubating Pt. with chest problem is important**
[12] They can't take a good breath > retention of the secretion > infection

3- Other conditions in the history:	
GIT:	➢ Indigestion and GER reflux. ➢ Heartburn (may indicate the possibility of a hiatus hernia → **Increase aspiration**). To prevent aspiration give antacids, H2 blockers or PPIs + ensure fasting of 8 hours prior to operation and do **rapid sequence induction: (giving fast IV anesthetic agent, keep suction ready, reoxygenate the pt. … we will teach you about it)**
Rheumatoid diseases: Systemic disease	➢ Chronically anaemic. ➢ Severely limited movement of their joints → makes positioning for surgery and airway maintenance difficult. ➢ Most imp are the temporomandibular joint and atlanto-occipital joint: - **Tenancy for dislocation of atlanto-occipital joint**. High risk of atlanto occipital subluxation.
Diabetes[13]:	➢ Patients have an increased incidence of: should ask about complications, medications and fasting[14] ● Ischaemic heart disease. ● Renal dysfunction. ● **Autonomic[15]** and peripheral neuropathy ➢ Intra- and postoperative complications. - (measure the fasting blood glucose prior to the OR) - Intraop > we fear hypoglycemia more than hyperglycemia b/c of risk of brain injury(Hypoglycemic encephalopathy) > check frequently the blood glucose intraop > maintain around 6-8 mmol
Neuromuscular disorders:	➢ Care with muscle relaxants. Because pts are very sensitive to relaxants "titrate doses" ➢ Coexisting heart disease. ➢ **Restrictive pulmonary disease** Some pt with neuromuscular disease might develop malignant hyperthermia - Avoid halothane inhalation agent
Chronic renal failure: **"Don't forget to check coagulation profile"**	➢ Anaemia > most of them their Hgb around 8 ➢ Electrolyte abnormalities → Hyperkalemia, hyponatremia & hypomagnesemia ➢ Altered drug excretion. you have to be selective and chose a drug that is metabolized extrarenal ➢ Restricts the choice of anaesthetic agents. Never use suxamethonium in renal failure it'll cause rapid hyperkalemia - **Always try to give such pt. Regional rather than GA**
Jaundice:Or liver	➢ Infectious or obstructive liver disease . We should rule out hepatitis, order blood tests

[13] **It should be controlled**

[14] **No anaesthetic should be undertaken (unless it is an emergency) until the patient is fasted.** This is to prevent both gastric acid and particulate matter entering the tracheobronchial tree, which can cause in the former case pneumonitis and in the latter case airway obstruction.

[15] They can't compensate, suppose the pt. Had vasodilation he can't compensate with tachycardia , so he will end up with severe bradycardia > hypotension > arrest ! SO , **IN DIABETIC PT. USE CARDIAC BASED ANESTHESIA** whatever the surgery was even he wasn't having cardiac symptoms.

impairment	➢ Altered drug metabolism. ➢ Altered Coagulation function. *use extrahepatic extrarenal metabolized drugs
Epilepsy:	➢ Well controlled or not, compliance to medication. If last attack before month refer to neurologist. ➢ Avoid anaesthetic agents potentially epileptogenic (e.g. enflurane) ➢ Predict convulsions which induced by withdrawal effects of anesthesia drugs. ➢ Anticonvulsant medication should be taking before taking the pt. To the OR It used to be (give General and avoid regional) but the updated practice **nowadays** ; espacily in obstetric pt. Who came for Normal vaginal delivery or for CS. > **give regional** ; bc if you give GA , with the drwal of GA at the end of the surgery they will have epilepsy - Pt came for normal vaginal delivery and epidural was requested: ➔ Labor pain analgesia is standard for epileptic pt. > bc it will reduce the epileptic attack ➔ YOU HAVE TO ROLL-OUT SPACE OCCUPYING LESIONS >bc any epidural puncture will make herniation. - Imaging should be done before. - **A recent epilepsy or pt. With no previous imaging, you should not give them epidural**
Drug and allergic Hx:	**Identify all medications:** ➢ Prescribed: - Medication that is **OK** to be taken before surgery: thyroxin - Medication will be **stopped** before surgery: **ACE** (stop the morning dose to avoid refractory HTN unless he is a HF pt. Don't stop it) ➢ Self-administered **and herbal remedies.** ➢ Allergies to drugs: Topical preparations (e.g. iodine), Adhesive dressings, Foodstuffs and latex.
Social x:	**Smoking**: (Number of cigarettes, amount of tobacco). exaggerated during intubation lead to increase cough. ➢ Nicotine stimulates the sympathetic nervous system causing: tachycardia, hypertension and coronary artery narrowing. - (smoking is the commonest cause of high BP & tachycardia in teenager) ➢ The clearance function is damaged > they can't cough properly and they will retain secretion. ➢ Smoking affect the wound healing , make the pt. Prone to infections , and his recovery will be. ➢ But the pt. On ventolin before surgery to clear the chest (at bedtime and 2 hours PO)+ he should stop smoking at least 1 month prior to surgery (stopping it 2-3 days will only improve the oxygenated Hgb, but it won't affect the secretions) **Alcohol**: (Induction of liver enzymes, tolerance) - Increased liver enzymes > increase the metabolism of the anaesthetic agents > resistance to anesthesia. **Addiction**: Difficulty with venous access, Thrombosis of veins and Withdrawal syndromes) - Most of the smoker are addicted to caffeine that also has it own effect.

	Look for tattooing? Risk of HIV & hepatitis B
Pregnancy:	➢ Increased risk of **regurgitation and aspiration. >** do rapid sequence induction ➢ Elective surgery is best postponed until after delivery.
Obesity:* **Check the pic imp**	➢ Cardiovascular, Respiratory, Sleep apnea[16], Diabetics, Fatty liver. ➢ Technical problem: Airway, aspiration, Intravenous access and Positioning.
Past anaesthetic Hx:	➢ Ask specifically about anaesthetic problems. ➢ Previous Hx of anesthesia allergy → usually the pt. will be provided with a card about his previous allergy
Family history:	➢ Ask specifically about malignant hyperthermia.

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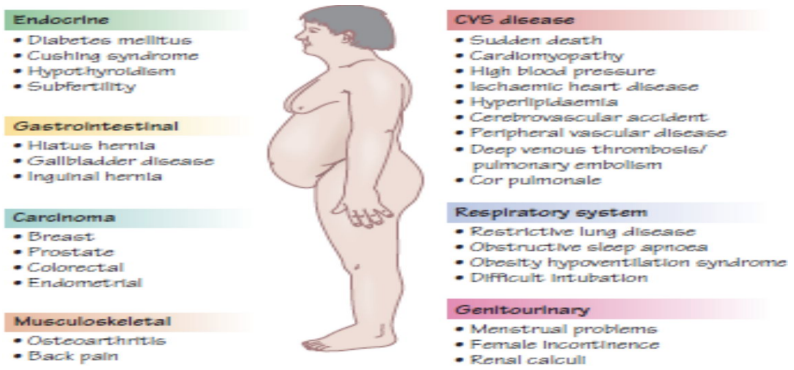


The Examinations:

Cardiovascular system ❖ Dysrhythmias: Atrial fibrillation. ❖ Heart failure. ❖ Valvular heart disease: Heart murmur ❖ **Blood pressure is best measured at the end of the examination**.	**Respiratory system** ❖ Cyanosis. > smoking (also they have secretion and crips) ❖ Hyperemia in corplamonale pt. ❖ Pattern of ventilation. ❖ Respiratory rate . ❖ Dyspnoea. ❖ Wheeziness. ❖ Signs of collapse. ❖ Consolidation and effusion (low air entry in auscultation)
Nervous system ❖ Chronic disease of the peripheral and central nervous systems: - Including foot drop in case of peripheral	**Musculoskeletal** ❖ Restriction of movement and deformities >be careful especially with the anesthetized pt. Any force movement you might break his bone

[16] In obstructive sleep apnea when they sleep and their breathing stop > cause retention to the CO2 > increase the CO2 will cause increase in the catecholamines > will lead to both pulmonary and systemic HTN

neuropathy > **always document what you see to avoid legal issue after the surgery** ❖ Evidence of motor or sensory impairment should be documented.	❖ Reduced muscle mass. ❖ Peripheral neuropathies. ❖ Pulmonary involvement. ❖ Particular attention to the patient's **cervical spine** and **temporomandibular joints** - **For the intubation**

The Examination "The Airway":

➢ Try and **predict difficult intubation**:

- poor mouth opening, obesity, a receding mandible and inability to protrude the mandible suggest difficult tracheal intubation.

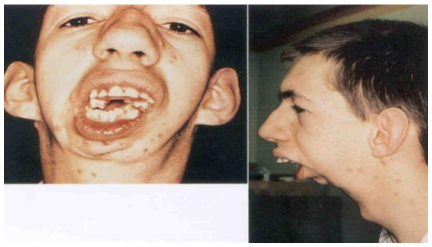
➢ Assessment is often made in **three stages.**

(documentation of everything that you observe is really important)

1. Observation of the patient's anatomy:

- In sitting position , ask the pt. To open his mouth
- **Look for:**
  1. limitation of mouth opening,
  2. Receding mandible position,
  3. Mouth hyagen, number and health of teeth,
  4. Size of tongue.
- Examine the front of the neck for soft tissue swellings, deviated larynx or trachea.
- Check the mobility of the cervical spine in both flexion and extension.
  - (pic)**Why would this man's airway be difficult to manage** ?

    b/c of Restricted mouth opening and **receding mandible** (small thyromental distance > no space for the tongue> poor visualization with laryngoscopy)



  - How to manage it ?

    With fiber optic laryngoscope.

★ Airway Evaluation:

- Oropharyngeal Visualization
- **Mallampati Score**
- Sitting Position, protrude tongue, **don't say "AHH"**
- Jaw Movement:
  - Both inter-incisor gap and anterior subluxation
  - <3.5 cm inter-incisor gap concerning > considered difficult
  - Inability to sublux lower incisors beyond upper incisors
    - Receding Mandible
    - Protruding Maxillary Incisors (buck teeth)

2. Simple bedside tests:

- Wilson score (weight, head and neck movement, jaw movement, receding mandible and buccal teeth).
- Mallampati criteria. Class 1: easy intubation, class 4: difficult intubation (you will find more details in airway management lecture)

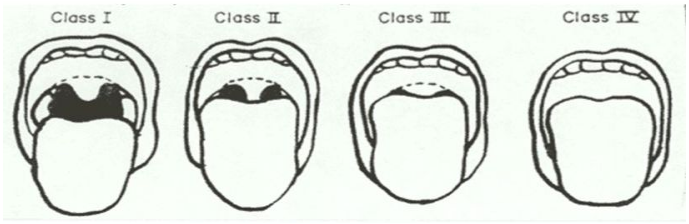
- **Thyromental distance** it should be 7 cm, <7 cm suggests difficult intubation.

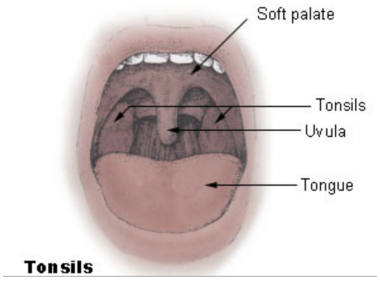
3. X-rays: we will not ask about it

- Lateral X-ray of the head and neck.
- Reduced distance between the occiput and the spinous process of C 1 (< 5 mm) and an increase in the posterior depth of the mandible (> 2.5 cm).
- **Rarely we do it**

This is exam Q

- **Mallampati score:**





Investigations:

Special Investigations "**Baseline investigations":**

If **no concurrent disease**, investigations can be limited as:

Age	Sex	Investigations
<40	Male	Nil. this is the universal criteria
<40	Female	**Hb**.
41-60	Male	ECG, Blood sugar, creatinine.
41-60	Female	Hb, ECG, Blood sugar, creatinine.
>61	**All**	Hb (anemia due to ageing), ECG, Blood sugar, creatinine.

Additional Investigations:

Urea and electrolytes	**Liver function tests**
❖ In patients taking **digoxin** ❖ Diuretics (hypokalemia). ❖ Diabetes (bc of the insul in effect on the potassium that lead to its entry to the cells with the glucose), **DKA,** renal disease. ❖ Vomiting/ Diarrhea	❖ Hepatic disease. ❖ High alcohol. ❖ Metastatic disease. ❖ Evidence of malnutrition.

Blood sugar ❖ Diabetes. ❖ Peripheral arterial disease. ❖ Taking long-term steroids.	**Electrocardiogram (ECG) we do it if more than 60yo** ❖ Hypertensive. ❖ With symptoms or signs of heart disease.
Chest X-ray[17]	**Pulmonary function tests**
Coagulation screen	**Sickle-cell screen if;** **Black race** **Family Hx of SCD**

For patients at risk and/or those undergoing major surgery (particularly vascular surgery) further, more detailed tests might include:

- Liver function tests.
- Arterial blood gas analysis.
- Respiratory function tests.
- Cardiac echocardiography and other imaging (including angiography) to assess left ventricular function, valve gradients and quantify ischaemic heart disease.

Referral !

Medical referral:

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). (Rx in the cath lab) ➢ Dysrhythmias: uncontrolled atrial fibrillation, paroxysmal supraventricular tachycardia, second and third degree heart block. (might need defibrillator) ➢ Congenital heart disease or symptomatic valvular heart disease.
RESPIRATORY DISEASE	➢ **Basically you need to clean the chest with physiotherapy , control the bronchospasm and treat the infections** ➢ Chronic obstructive airways disease, if dyspnoeic at rest. ➢ Bronchiectasis. ➢ Asthmatics: ❑ Unstable. ❑ Taking oral steroids or have a FEV_1 % 60% predicted.
ENDOCRINE DISORDERS[18]	➢ DM pt. Should be controlled. ➢ Insulin and non-insulin dependent diabetics[19].

[17] Cervical spine X ray may be required in those with suspected cervical spine degeneration, surgery and trauma as neck mobility is a key determinant of ease of tracheal intubation.

[18] Surgery pus the pt.in stress > needs a functioning adrenal gland to produce cortisol > if not you have to provide it to the pt.

[19] For insulin-dependent diabetic patients, long-acting insulin is generally discontinued and a sliding scale with short-acting i.v. insulin is commenced.

	➢ Ketonuria. ➢ Random blood sugar > 12 mmol/L ➢ Hypo- or hyperthyroidism. (check the function) ➢ Cushing's. ➢ **Addison's disease (hyper**kalemia and **hyponatremia**> prone to hypotension) ➢ **Hypopituitarism (tendency to the hypotension)**
RENAL DISEASE	➢ Chronic renal failure. ➢ Patients undergoing chronic dialysis (they mostly on anticoagulants , so you need to check the coagulation profile to avoid possible coagulopathy) ➢ Repeat the Renal function and electrolytes before taking the pt. to the OR)
HAEMATOLOGICAL DISORDERS	➢ Bleeding diathesis: haemophilia, thrombocytopenia. ➢ Therapeutic anticoagulation (sometime we need to shift the pt. from warfarin to heparin) ➢ Haemoglobinopathies. ➢ Polycythaemia. ➢ Haemolytic anaemias. ➢ Leukaemias.

FACTORES INCREASED RISK OF MORTALITY:

- ❑ **Inadequate preoperative preparation** including resuscitation.
- ❑ **Lack of and inappropriate monitoring during surgery**.
- ❑ **Poor postoperative care (you should decide after the surgery where should the pt. Go ... ward? HDU? ICU?)**, including lack of intensive care beds.
- ❑ Inadequate supervision of trainees.

★ Mortality related to anaesthesia:

- Approx 1:26,000 anaesthetics. (in the last update 2016 it get less 1:100,000)
- One third of deaths are preventable.
- Causes in order of frequency:
  - **Inadequate patient preparation.**
  - Inadequate postoperative management.
  - Wrong choice of anaesthetic technique.
  - Inadequate crisis management. Means that the anesthesiologist should update himself about the crisis protocol

★ Anaesthetic associated deaths:

- ➢ 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. (Expose the pt. To more fluids imbalance , hypothermia, DIC and the other complications)
- Emergency operations.

MCQs ★ ASA grading "American Society of Anesthesiologists":[20]

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).

ASA PS Classification	Definition	Examples, including, but not limited to:
ASA I	A normal healthy patient	Healthy, non-smoking, no or 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), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or 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 ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD 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 the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

[20] Cardiac risk is the major area that has been studied, as perioperative cardiac events are not uncommon and carry a significant mortality.

Informing the patient:

- The choice of anaesthetic technique rests with the anaesthetist, but most patients appreciate some details of what to expect.
- ★**MCQs The perioperative patient journey:** (Consent - Surgical safety checklist "Sign In | Time Out | Sign Out" - Criteria for discharge from a day surgery unit).
- Patients will ask about their immediate recovery.
- Finally:
  - Reassure patients about postoperative pain control.
  - Informed of the technique.
- Consent for anaesthesia.

Consent:

- 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:
  1. **Common side effects**, e.g. postoperative nausea and vomiting.
  2. **Rare side effects**, e.g. nerve damage after spinal or epidural Anaesthesia.
  3. **Risks specific to that patient** – this can relate to a career (e.g. an opera singer and the risk of vocal cord injury) or the risk of perioperative myocardial infarction in a patient with a significant history of cardiac disease.
- Consent must be obtained before any sedating , premedication is given.

Consent requires:

➢ **Capacity** necessitates:

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

➢ **Enough relevant information.**

➢ **Voluntariness.**

Pre-Medication:

The 6As of premedication[21]:

- **Anxiolysis:**
  - The best anxiolytic is the anesthetist who visits the patient and listens to the patient.
  - Benzodiazepines | Phenothiazines.
- **Amnesia:** Lorazepam(long acting) | anterograde amnesia.
- **Anti-emetic:** [22]
  - 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 inhibitors| Metoclopramide naso- or orogastric tube.
- **Anti-autonomic:**
  - ➢ Parasympathetic reflexes: increased muscarinic effects
    - Excessive vagal activity causing profound bradycardia.
    - Halothane.
    - Suxamethonium.
    - Surgery.
    - Traction on the extraocular muscles. Stimulation of the 6th cranial nerve > bradycardia
    - Handling of the viscera. Anal and cervical dilation > bradycardia
    - During elevation of a fractured zygoma.
- **Analgesic**

Patients at risk of gastric aspiration even after fasting:

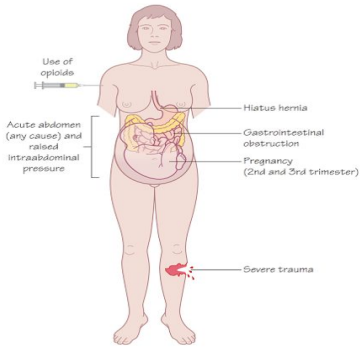


Figure 6.2 Patients at risk of gastric aspiration even after fasting

- **Gastrointestinal obstruction.** (Decompression prior to anesthesia is a must, if wasn't done > head down rapid suction)
- Hiatus hernia.

[21] Generally, all medication is continued perioperatively except: Drugs that affect coagu heparin, aspirin, clopidogrel). | Hypoglycemics. | some hypotensive drugs, e.g. ACE inh on the day of surgery.

[22] before consider pharmacological treatment you can reduce N/V by;
1-Fasting for 12 hours Pre-operative
2-Avoid hyperventilation? Induce N/V as air escape to GI
3-Hydrate well
Shock fact; Smoking reduce N/V

- Pregnancy (2nd and 3rd trimester).
- Severe trauma.
- Use of opioids. Delay the gastric emptying time
- Acute abdomen (any cause).
- Raised intra abdominal pressure.

Surgical safety checklist "Sign In | Time Out | Sign Out" :

Sign In **"**Before induction of anesthesia"	➢ **Patient has confirmed**: Identity | Site | Procedure | Consent. ➢ **Site marked**/not applicable. ➢ Anesthesia safety check completed, Pulse oximeter on patient and functioning. ➢ *Does patient have a:* ● Known allergy? ● Difficult airway/aspiration risk? Yes | NO? (equipment/assistance available). ● Risk of >500mL blood loss (7 mL/kg in children)? If yes, and adequate intravenous access and fluids planned. **Intraoperative stage:** ● The patient arrives in the anaesthetic room, sign in. ● Apply monitoring (ASA standard monitors, invasive monitor). ● Large IV cannula. A small cannula is used if minimal blood loss is anticipated. ● Invasive monitors neuraxial intervention (spinal epidural) or general anesthesia with endotracheal intubation or LMA insertion. ● Peripheral nerve block should be in block area before general anesthesia. ● Application of limb tourniquets and urinary catheter insertion occur, if indicated.
Time Out "After induction of anesthesia and Before skin incision"	➢ **Occurs in the operating theatre before the start of the operation.** ➢ The team all introduce themselves. ➢ **Identify the patient and the planned operation and site** (including anticipated blood loss). ➢ Any medical concerns about the patient. ➢ A check of availability of all equipment and imaging for the proposed operation is also established. ➢ Confirm all team members have introduced themselves by name and role. ➢ Surgeon, Anesthesia professional and nurse verbally confirm (Patient, Site, Procedure). **Anticipated critical events:** ● Surgeon reviews: what are the critical or unexpected steps, operative duration, anticipated blood loss? ● Anesthesia team reviews: are there any patient specific concerns? ● Nursing team reviews: has sterility (including indicator results) been confirmed? Are the equipment, issues or any concerns? **Has antibiotic prophylaxis been given within the last 60 minutes? Yes, Not applicable.** - **If it was before more than 60 min we should repeat the dose**

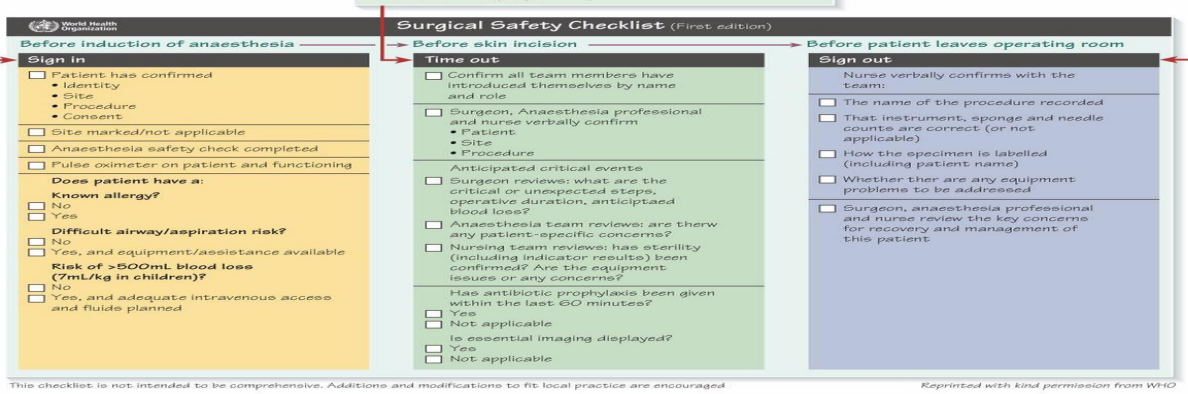
Sign Out "Before patient leaves operating room"	➢ Nurse verbally confirms with the team: 1. The name of the procedure recorded That instrument, **sponge and needles counts are correct** (or not applicable). 2. How the specimen is labelled (including patient name). 3. Whether there are any equipment problems to be addressed. ➢ Surgeon, anesthesia professional and nurse review the key concerns for recovery and management of this patient post operatively. ## Postoperative stage: ● At the end of the operation, the patient is either extubated in the operating theatre (and an oropharyngeal airway inserted if needed) or transferred to the recovery room with an LMA still in situ. ● All patients receive supplemental oxygen during transfer. ● Many patients who do not have a general anesthesia/sedation bypass the recovery room and go straight from the operating theatre to stage 2 recovery in the day surgery unit. Examples include local anesthesia cases (e.g. minor surface surgery, cataract removal, some regional anesthesia cases). ## Once in the recovery room: ➢ A handover occurs between the anaesthetist and a recovery nurse. ➢ Important information passed on includes: (patient's name and age | operation details | blood loss. ➢ *Anaesthetic technique with emphasis on:* - Analgesia given. - Regional/nerve blocks. - Antiemetics given. - Antibiotics. - The use of local anaesthetic infiltration. - Thromboprophylaxis. Figure 8.3 Criteria for discharge from a day surgery unit **Before discharge from the day surgery unit, the patient must:** • Be pain free • Have taken oral fluids } Preferred but not essential • Have passed urine • Have a carer at home for first 24 hours • Be given and understand oral and written instructions • Be given a contact number to call in case of problems and have access to a telephone at home • Have adequate oral analgesia • Be given instructions not to do any of the following for first 24 hours: – drive a car – operate any sort of machinery – cook

Figure 8.2 Surgical safety checklist

Sign in occurs before anaesthesia starts. The patient's details are checked, as well as the operation, consent, appropriate marking of site, allergies, potential airway issues and the anticipated blood loss.

Time out occurs in the operating theatre before the start of the operation. The team all introduce themselves, formally identify the patient and the planned operation and site (including anticipated blood loss), as well as any medical concerns about the patient. A check of availability of all equipment and imaging for the proposed operation is also established.

Sign out at the end of the operation. There is a summary of the procedure, including a check of swabs and instruments, and there is a log of any unexpected events during the operation.



★MCQs

Q1: Which one of the following is the most significant predictor of difficult airway during preoperative assessment?

A. Past History of difficult intubation
B. Mallampatti grade III
C. Missing teeth
D. Morbid obesity

Q2: Which of the following consider ASA 1 standard monitors?

A. Pulse oximetry
B. Capnography
C. Anesthesiologist presence
D. Blood pressure monitoring

Q3: Which of the following is the intra operative time period?

A. From leaving floor to operating room
B. From entering the OR theatre to recovery room
C. From leaving the hospital for discharge
D. From leaving recovery room till time of follow up

Q4: A 75 year old patient presents with sign and symptoms of uncontrolled HTN and T2DM. He underwent prostatectomy. **Which one of the following is ASA classification for this patient?**

A. I
B. II
C. III
D. IV

Q5: Which on of the following is considered a high perioperative risk?

A. Age above 60
B. Essential HTN
C. Hyperlipidemia
D. Severe aortic stenosis

Q6: A 75 year old male patient came to ER complaining of severe abdominal pain diagnosed as perforated bowel. **What is the classification of this surgery regarding time factor?**

A. Elective
B. Expedited
C. Urgent
D. Immediate

Q7: A 34 year old patient booked for elective C/S. when the antibiotics prophylaxis should be given preoperatively?

A. 60 min
B. 90 min
C. 120 min
D. 150 min

Q8: What is the main reason for giving 2 mg oral lorazepam to a 24 patient who is scheduled for left hemithyroidectomy?

A. Antisialagogue
B. Amnesia
C. Analgesia
D. Antiemesis

Q1: A | Q2: C | Q3: B |Q4: C | Q5: D | Q6: C | Q7: A | Q8: B