Preoperative Anaesthetic Assessment and Premedication
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Objective

1) learn pre-anesthetic patient evaluation and risk stratification.
2) Obtain a full history and physical examination including allergies, current medications, past anesthetic history, family anesthetic history
3) Understand how patient co-morbidities can affect the anesthetic plan.
4) Understand potential anesthetic options for a given surgical procedure.
5) Able to plan an anesthetic for a basic surgical procedure.
6) Understand risk stratification of a patient undergoing anesthesia
7) The perioperative patient journey

Overview

The preoperative visit

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

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, e.g. trauma, aneurysm
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

The preoperative visit

- Main aim is to assess the patient's fitness for anaesthesia
- The Best to be performed by an anaesthetist
- Preferably the one who is going to administer the anaesthetic

The Goal of Preoperative visit.

- To educate about anesthesia , perioperative care and pain management 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

The preoperative visit

visit allows

- Best anaesthetic technique
- Any potential interactions between concurrent diseases
- Anaesthesia anticipated
- Provides an explanation
- Reassurance for the patient

The preoperative visit

Coexisting Illness

- Improve the patients condition prior to surgery
- Seeking advice from other specialists
- Optimise treatment
- Final decision .

- Three situations where special arrangements are usually made

  1-Patients with complex medical or surgical problems

  - patient is often admitted several days before surgery
  - anaesthetist is actively involved in optimising their condition prior to anaesthesia and surgery

  2-Surgical emergencies

  only a few hours separates admission and operation in these patients urgent investigations or treatment

  3-Day-case patients

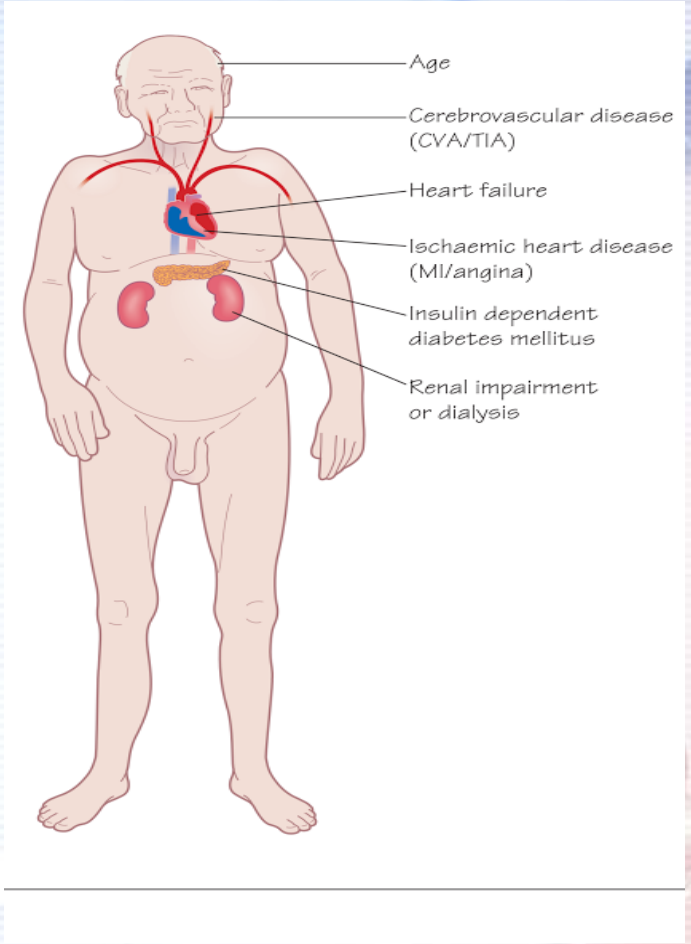
  - These are patients who are planned
  - Generally ‘fitter’ ASA1 or ASA 2
  - Assessment in anesthesia clinic

PREVIOUS ANAESTHETICS AND OPERATIONS

- **Hospitals**
- **Enquire about inherited or 'family' diseases**
  - sickle-cell disease
  - porphyria
- **Difficulties with previous anaesthetics**
  - History of difficult intubation
  - nausea
  - vomiting
  - dreams
  - awareness
  - postoperative jaundice
- **Present & past medical history**
  - all the aspects of the patient's medical history
  - relating to the cardiovascular and respiratory systems and its severity

Patient factors associated with cardiac risk

- Age
- Heart failure
- Ischaemic heart disease
- (MI / angina)
- Cerebrovascular disease
  (CVA / TIA)
- Insulin dependent diabetes mellitus
- Renal impairment or dialysis



Cardiovascular system

- **Specific enquiries must be made about:**
  - Angina
    - incidence
    - precipitating factors
    - duration
    - use of anti-anginal medications, e.g. glyceryl trinitrate (GTN) oral or sublingual)
  - Previous myocardial infarction and subsequent symptoms
  - Symptoms indicating heart failure

Cardiovascular system

- Myocardial infarction are at a greater risk of perioperative reinfarction
- Elective surgery postponed until at least 6 months after the event
- Untreated or poorly controlled hypertension (diastolic consistently > 110 mmHg) may lead to exaggerated cardiovascular responses
- Both hypertension and hypotension can be precipitated which increase the risk of myocardial ischemia

Cardiovascular system

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

- valvular heart disease

  * ? prosthetic valves may be on anticoagulants -- need to be stopped or changed prior to surgery

  * Antibiotic prophylaxis

Active Cardiac Conditions

- Unstable coronary syndromes
  - Unstable or severe angina
  - Recent MI
- Decompensated HF
- Significant arrhythmias
- Severe valvar disease

Minor Cardiac Predictors

- Advanced age (>70)
- Abnormal ECG
  - LV hypertrophy
  - LBBB
  - ST-T abnormalities
  - Rhythm other than sinus
- Uncontrolled systemic hypertension

Active Cardiac Conditions

Unstable coronary syndromes (severe or unstable angina; recent MI)
Decompensated CHF
Significant Arrhythmia or Heart Block
Severe aortic or mitral valvular disease (AS < 1.0cm2; mean gradient 40mmHg; symptomatic mitral or aortic dz)

Surgical Risk Stratification

High Risk: Vascular Surgery
Intermediate Risk: Intraperitoneal; Intrathoracic; Carotid; Head & Neck; Orthopedic; Prostate
Low Risk: Endoscopy; Superficial Procedures; Cataract; Breast; Other Ambulatory Surgery

Cardiovascular MET Estimations

METs	Exercise	Recreation	Work / Household Activities
1.5-2.0 METs	Slow walk 40-60 min mile	Watching TV Playing Cards	Desk work Light Housework 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 lbs 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

Surgical factors in assessment of risk of significant cardiac event

Low risk <1%	Minor orthopaedic and urology • Gynaecology • Breast • Dental
Intermediate 1–5%	Major orthopaedic and urology • Abdominal • Head and neck
High risk >5%	Aortic, major vascular • Peripheral vascular • Intraperitoneal/intrathoracic

THEN  RS

Respiratory system

Patients with pre-existing lung disease

- prone to postoperative chest infections if they are obese or undergoing upper abdominal or thoracic surgery
- In the patients with chronic obstructive lung disease they have sputum production (volume and color) , dyspnea. Should be treated preoperatively
- Bronchial Asthma, including precipitating factor and last attack , previous hospital admission
- upper respiratory tract infection (anaesthesia and surgery should be postponed unless it is for a life-threatening condition)

Other conditions in the medical history

- GI
  - Indigestion
  - GER reflux
  - Hurt burn
    - may indicate the possibility of a hiatus hernia
- Rheumatoid disease
    - chronically anaemic
    - severely limited movement of their joints
    - makes positioning for surgery and airway maintenance difficult.
    - Tendency for dislocation of atalnto-occiptal joint

Other conditions in the medical history

- Diabetes
  - Patients have an increased incidence of
    - ischaemic heart disease
    - renal dysfunction
    - autonomic and peripheral neuropathy
  - intra- and postoperative complications
- Neuromuscular disorders
  - Care with muscle relaxants
  - Coexisting heart disease
  - restrictive pulmonary disease

Other conditions in the medical history

- Chronic renal failure
  - Anaemia
  - Electrolyte abnormalities
  - Altered drug excretion
  - Restricts the choice of anaesthetic agents
- Jaundice
  - 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)
  - Predict convulsions which induced by withdrawal effects of anesthesia drugs

DRUG HISTORY AND ALLERGIES

- **Identify all medications**
  - Prescribed
  - self-administered
  - Allergies to drugs
    - topical preparations (e.g. iodine)
    - adhesive dressings
    - foodstuffs
    - Latex allergy

SOCIAL HISTORY

- **Smoking**
  - number of cigarettes
  - amount of tobacco *nicotine stimulates the sympathetic nervous system*
    - *causing tachycardia*
    - *hypertension*
    - *coronary artery narrowing*
- **Alcohol**
  - induction of liver enzymes
  - tolerance

Addiction

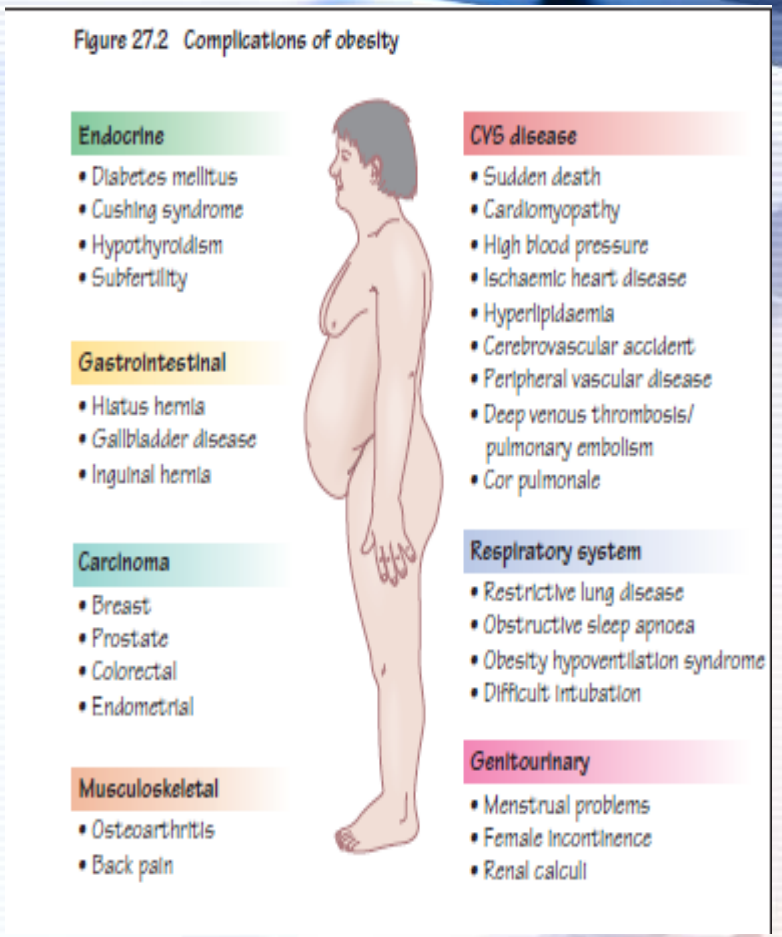
- Difficulty with venous access
- Thrombosis of veins
- Withdrawal syndromes

Look for tattooing ????

- **Pregnancy**
  - increased risk of regurgitation and aspiration
  - Elective surgery is best postponed until after delivery.

Obesity

- Cardiovascular
- Respiratory
- Sleep apnea
- Diabetics
- Fatty liver
- Technical problem
  - Airway , aspiration
  - Intravenous access
  - Positioning



THE EXAMINATION

THE EXAMINATION

Cardiovascular system

- dysrhythmias
- atrial fibrillation
- heart failure
- heart murmur
- valvular heart disease
- blood pressure is best measured at the end of the examination

Respiratory system

- cyanosis
- pattern of ventilation
- respiratory rate
- Dyspnoea
- Wheeziness
- signs of collapse
- consolidation and effusion

THE EXAMINATION

Nervous system

- Chronic disease of the peripheral and central nervous systems
- evidence of motor or sensory impairment should be documented

Musculoskeletal

- restriction of movement and deformities
- reduced muscle mass
- peripheral neuropathies
- pulmonary involvement
- Particular attention to the patient's cervical spine and temporomandibular joints

THE EXAMINATION

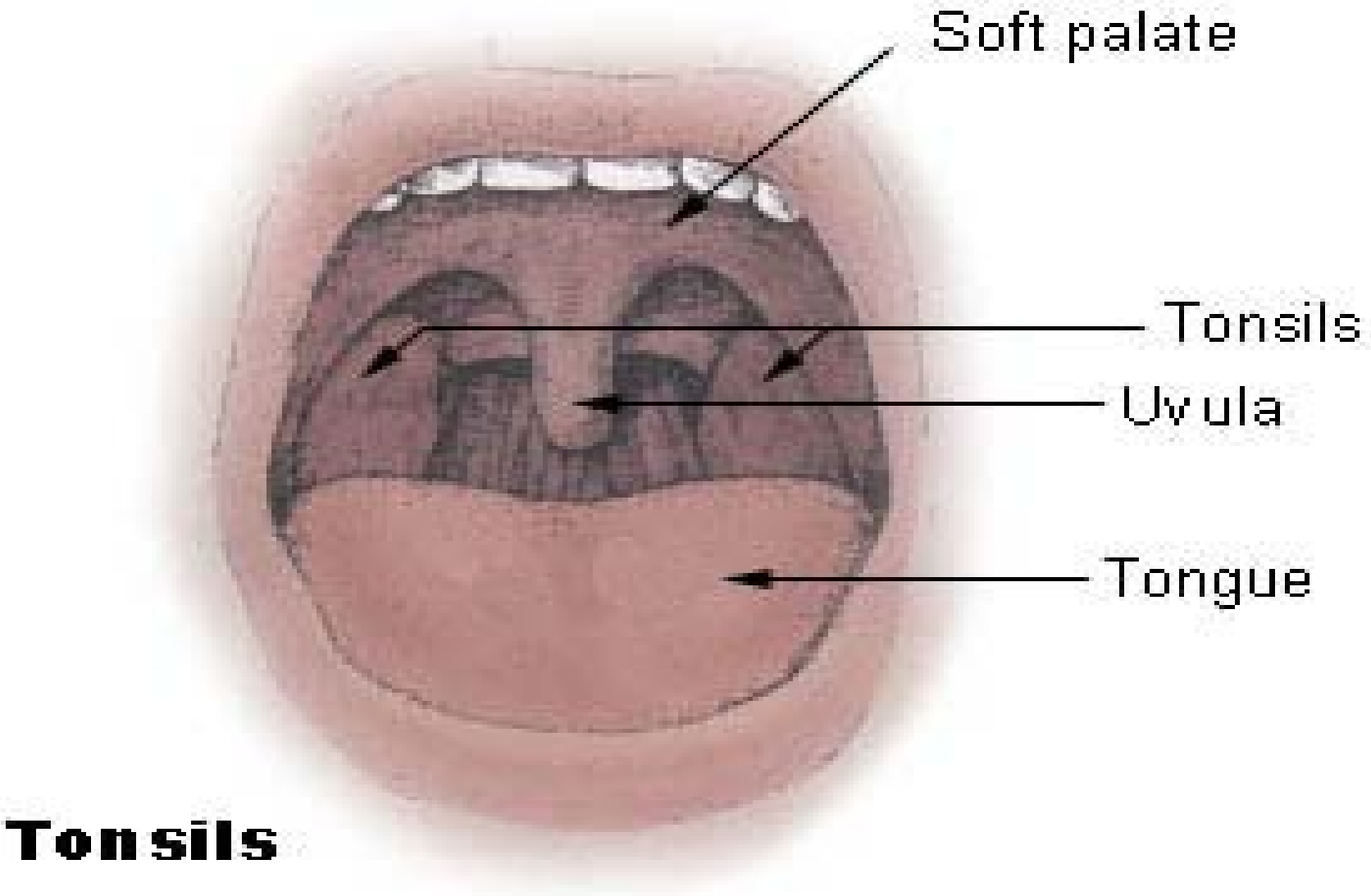
The airway

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

1. Observation of the patient's anatomy

- Look for limitation of mouth opening, receding mandible position, number and health of teeth, 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.

Airway Evaluation



Tonsils

Airway Evaluation (cont.)

- Take very seriously history of prior difficulty
- Head and neck movement (extension)
  - Alignment of oral, pharyngeal, laryngeal axes
  - Cervical spine arthritis or trauma, burn, radiation, tumor, infection, scleroderma, short and thick neck

Airway Evaluation (cont..)

- Jaw Movement

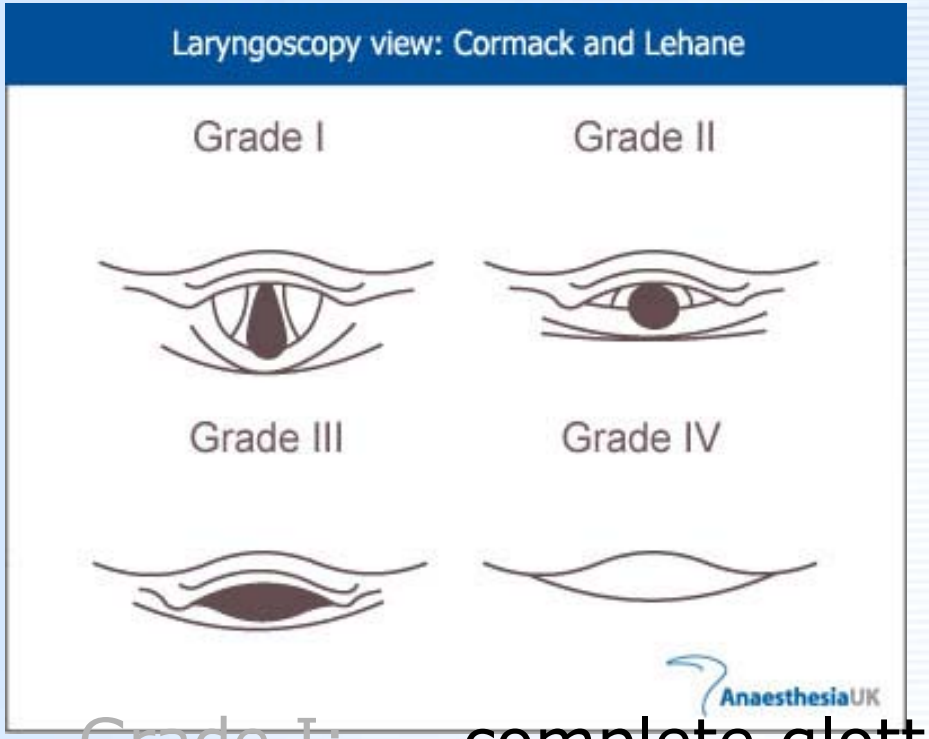
  Receding mandible

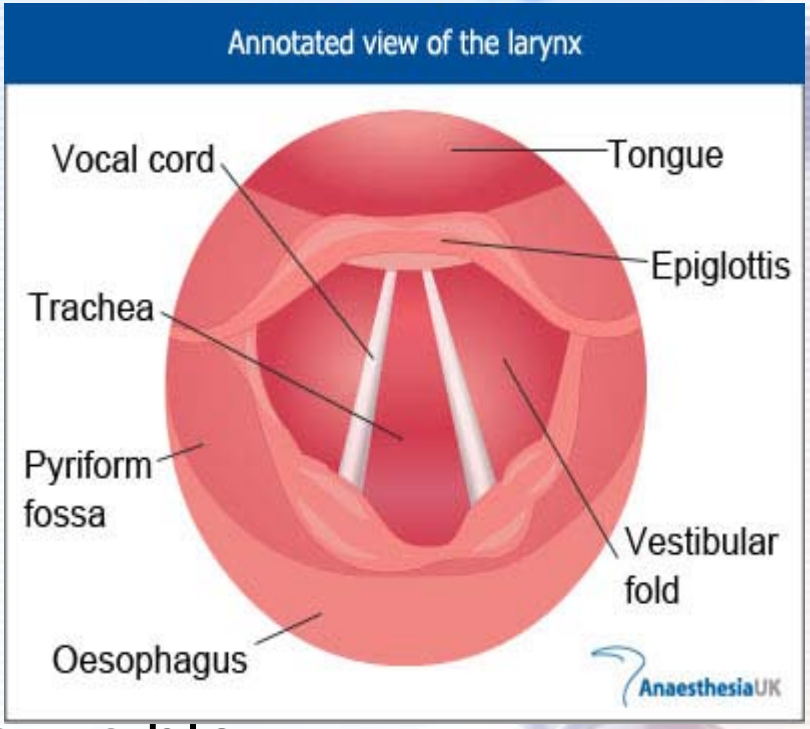
  Inability to sublux lower incisors beyond upper incisors

- Protruding Maxillary Incisors (buck teeth)

Airway Evaluation (cont…)

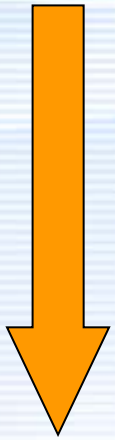
Laryngoscopy view: Cormack and Lehane





Grade I: complete glottis visible
Grade II: anterior glottis not seen
Grade III: epiglottis seen, but not glottis
Grade IV: epiglottis not seen

Airway assessment



Investigations

Special Investigations

Baseline investigations

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

Age	Sex	Investigations
<40	Male	Nil
<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

- Urea and electrolytes
  - in patients taking digoxin
  - diuretics
  - diabetes, renal disease
  - vomiting
  - diarrhea
- Liver function tests
  - hepatic disease
  - high alcohol
  - metastatic disease
  - evidence of malnutrition

ADDITIONAL INVESTIGATIONS

- Blood sugar
  - Diabetes
  - peripheral arterial disease
  - taking long-term steroids
- Electrocardiogram (ECG)
  - hypertensive
  - with symptoms or signs of heart disease
- Chest X-ray
- Pulmonary function tests
- Coagulation screen
- Sickle-cell screen

Referral

Medical referral

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

Medical referral

- **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

Medical referral

- **RESPIRATORY DISEASE**
  - Chronic obstructive airways disease, if dyspnoeic at rest.
  - Bronchiectasis
  - Asthmatics
    - unstable
    - taking oral steroids or
    - have a FEV_1 % 60% predicted

Medical referral

- **ENDOCRINE DISORDERS**
  - Insulin and non-insulin dependent diabetics
  - ketonuria
  - random blood sugar > 12mmol/L
  - Hypo- or hyperthyroidism
  - Cushing's
  - Addison's disease
  - Hypopituitarism

Medical referral

- **RENAL DISEASE**
  - Chronic renal failure
  - Patients undergoing chronic dialysis
- **HAEMATOLOGICAL DISORDERS**
  - Bleeding diatheses
    - haemophilia
    - thrombocytopenia
  - Therapeutic anticoagulation
  - Haemoglobinopathies
  - Polycythaemia
  - Haemolytic anaemias
  - Leukaemias

FACTORES INCREASED RISK OF MORTALITY

INCREASED RISK OF MORTALITY

- Inadequate preoperative preparation including resuscitation
- Lack of and inappropriate monitoring during surgery
- Poor postoperative care, including lack of intensive care beds
- Inadequate supervision of trainees

Mortality related to anaesthesia

- Approx 1:26,000 anaesthetics
- 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

ANAESTHETIC ASSOCIATED DEATHS

- Increasing age: >60 years
- Sex: male > female
- Worsening physical status
- Increasing number of concurrent medical conditions, in particular:
  - myocardial infarction
  - diabetes mellitus

ANAESTHETIC ASSOCIATED DEATHS

- renal disease
- Increasing complexity of surgery:
  - intracranial
  - major vascular
  - intrathoracic
- Increasing length of surgery
- Emergency operations

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	

- *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)

Preoperative fasting

- 2 hours water with juice without pulb
- 4 hours breast feeding
- 6 hours formula
- 8 hours after heavy fatty meal

Informing the patient

Informing the patient

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

The perioperative patient journey

- Consent
- Surgical safety checklist
- Criteria for discharge from a day surgery unit

INFORMED ANESTHESIA CONSENT

إقرار الموافقة على التخدير
AD-CON-10

I, Dr. .... have discussed and explained the type of Anesthesia or Analgesia, as well as the outcomes, alternatives, benefits and potential risks.
I confirm that the opportunity has given to the patient /caregiver/ to ask questions related to the type of anesthesia and those were answered.

- ☐ Procedural Sedation ☐ Pain Managements
- ☐ General Anesthesia ☐ Labor Analgesia
- ☐ Regional Anesthesia/Analgesia.
  - ○ Neuraxial ○ Spinal ○ Caudal ○ Epidural ○ CSE
  - ○ Plexus or Peripheral nerve blocks ....
- ☐ Others ....

I, ... (name) acknowledge that I have been educated (and received the educational tools/reprints) by the Anesthetist / his Assistant including the risks, benefits, outcomes, and alternatives related to the planned anesthesia, postoperative or labor analgesia. If during the course of the procedure, an unforeseen condition arises which calls for an additional or different types of Anesthesia / Analgesia from that agreed upon, I further consent to the changes in accordance with accepted anesthesia practice.

I acknowledge that I have had the opportunity to ask questions, and have had them answered.

Common Complications

General Anesthesia	• Postoperative Nausea and Vomiting • Sore Throat • Dental / Soft tissue injury • Cardiovascular .... • Respiratory .... • Others	• Aspiration • Allergy / Anaphylaxis • Position related injury
Regional Anesthesia	• Hypotension / Bradycardia • Back pain / Local tenderness • Neural deficits • High or extensive block • Neonatal side effects (Labor analgesia)	• Post-Dural Puncture Headache (PDPH) • Local Anesthesia toxicities • Failure / Inadequate analgesia • Prolonged sensory / motor blockade
Specific Complications	....	

Patient / Relative:

Full Name ....

☐ Patient ☐ Legal Guardian ☐ Relative ....

☐ Other ....

Signature .... Date and Time ....

Witness/Translator

Name .... Name ....

Signature .... Signature ....

Date and Time .... Date and Time ....

Anesthetist:

Dr. Name .... ID ....

Signature .... Date and Time ....

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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

1. **Capacity** necessitates:
   - Ability to understand and retain information about the treatment
   - Ability to weigh up the information
   - Ability to make a free choice
2. **Enough relevant information**

Informing the patient

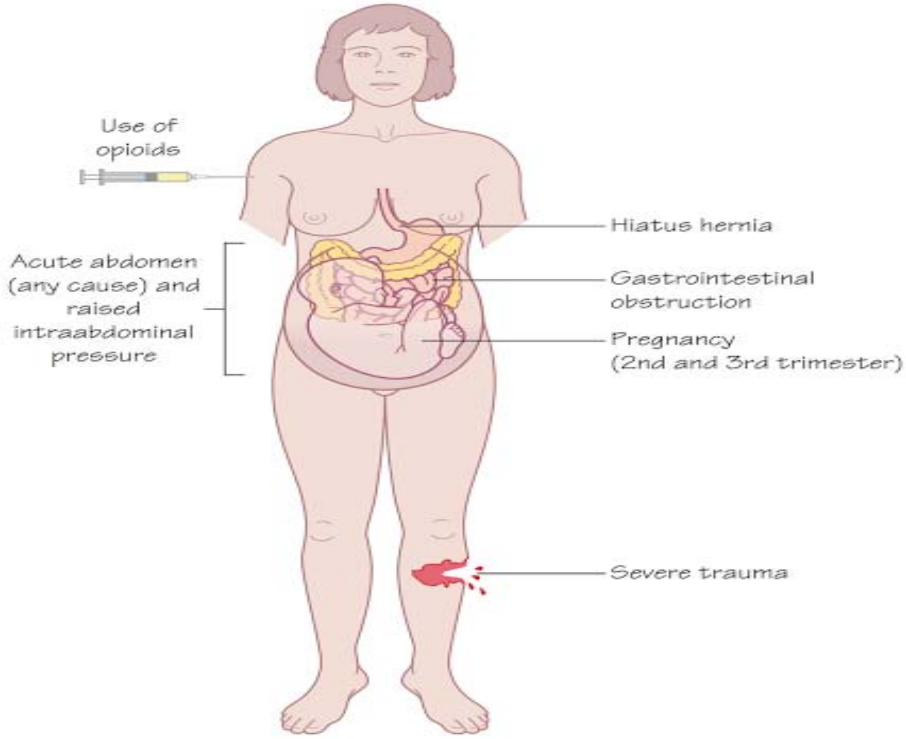
- patients will ask about their immediate recovery
- Finally
  - reassure patients about postoperative pain control
  - informed of the technique
- Consent for anaesthesia

Premedication

Patients at risk of gastric aspiration even after fasting

- Gastrointestinal obstruction
- Hiatus hernia
- Pregnancy (2nd and 3rd trimester)
- Severe trauma
- Use of opioids
- Acute abdomen (any cause)
- Raised intraabdominal pressure

Figure 6.2 Patients at risk of gastric aspiration even after fasting



The 6 As of premedication

- Anxiolysis – the best anxiolytic is the anesthetist who visits the patient and listens to the patient
- Amnesia
- Anti-emetic
- Antacid
- Anti-autonomic
- Analgesic

Premedication

- Anxiolysis
  - benzodiazepines
  - phenothiazines
- Amnesia
  - lorazepam
    - anterograde amnesia

Premedication

- Anti-emetic
  - dopamine antagonists
  - antihistamines
  - anticholinergics
  - phenothiazines
  - 5-hydroxytryptamine antagonists
  - a_2- agonists: clonidine, Dex

Premedication

- Antacid
  - Patients who have received opiates
  - present as emergencies
  - If in pain
  - delayed gastric emptying
  - hiatus hernia
  - Oral sodium citrate
  - Ranitidine , Proton inhibitors
  - Metoclopramide
  - naso- or orogastric tube

Premedication

- Anti-autonomic
  - Parasympathetic reflexes
    - Excessive vagal activity causing profound bradycardia
    - halothane
    - suxamethonium
    - surgery
    - traction on the extraocular muscles
    - handling of the viscera
    - during elevation of a fractured zygoma

SURGICAL SAFETY CHECKLIST

Patient Name:

Procedure:

Date:

Notes:

Before induction of anesthesia

SIGN IN

- ❑ **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?

❑ NO ❑ YES

Difficult airway/aspiration risk?

❑ NO ❑ YES, and equipment/ assistance available

Risk of >500ml bood loss (7ml/kg in children)?

❑ NO ❑ YES, and adequate intravenous access and fluids planned

Before skin incision

TIME OUT

- ❑ **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 there equipment issues or any concerns?

Has antibiotic Prophylaxis been given within the last 60 minutes?

❑ YES ❑ Not applicable

Is essential imaging displayed?

❑ YES ❑ Not applicable

Before patient leaves operating room

SIGN OUT

Nurse verbally confirms with the team:

- ❑ **The name of the procedure recorded**
- ❑ **That instrument, sponge, and needle counts are correct** (or not applicable)
- ❑ **How the specimen is labelled** (including patient name)
- ❑ **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**

Postoperative stage

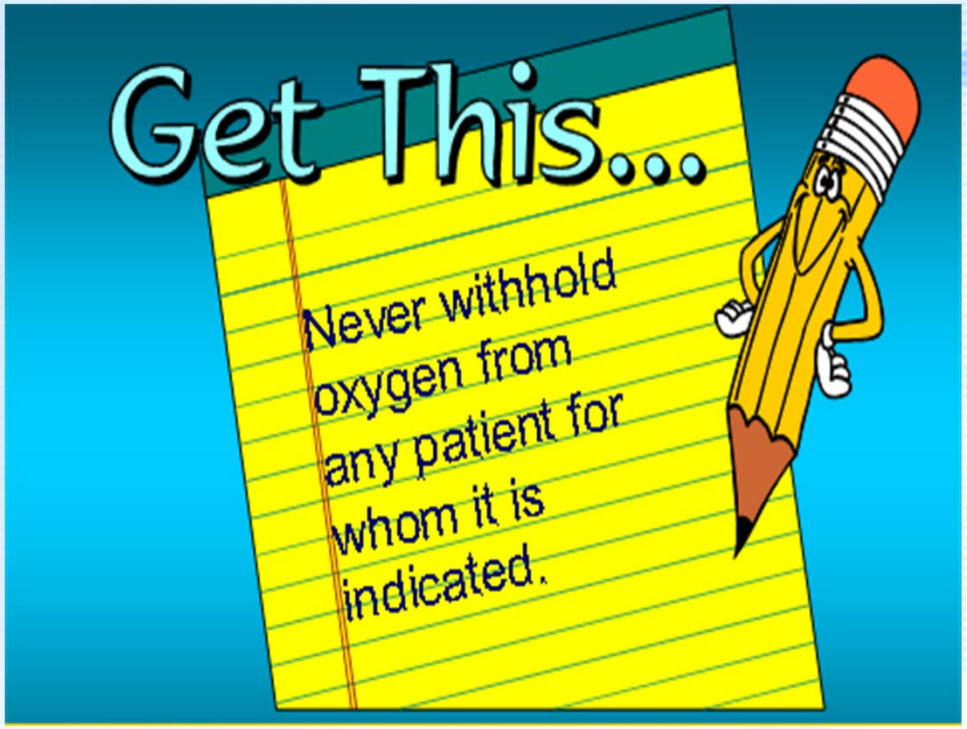
- At the end of the operation, the patient is either extubated in the operating theatre (and an oropharyngeal airway inserted if needed) or transferred to the recovery room with an LMA still *in situ*.
- All patients receive supplemental oxygen during transfer.
- Many patients who do not have a general anesthetia/sedation bypass the recovery room and go straight from the operating theatre

Examples include local anesthetia cases (e.g. minor surface surgery, cataract removal, some regional anesthetia cases).

Once in the recovery room,

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

THANK YOU


Get This...
Never withhold oxygen from any patient for whom it is indicated.