Preoperative preparation

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Objectives

- Gather all relevant information.
- Optimization of patient.
- Proper counselling.
- Proper surgical plan.
- Uneventful postoperative outcome.

Aim

- Minimize risk and
- Maximize benefit for the patient.

Routine preoperative preparation

Evaluation –

- Proper history.
- Exclude any significant medical problems.
- Check clinical signs against the planed surgical procedure.

Routine preoperative preparation

- Full drug and disease history regarding
  - Allergic responses to drugs, latex and skin allergy.
  - Hypertension
  - IHD
  - Bronchodilators
  - Steroids

Contd…

- Warfarin-
  - Should stop 3-4 days prior operation.
  - Should check PT.
  - Those who are on warfarin for previous 3 months should switch to IV heparin 6h before and start 4h later surgery.
- Aspirin / Clofidogrel –
  - Ideally 5-7 days before surgery.
  - At least 48hrs before.
- OCP- stop 4weeks prior.

Evaluation

- Nutritional assessment is essential and can be done by following –
  - Total body weight.
  - Skin fold thickness .
  - Amount of subcutaneous fat.
  - Biochemical – serum albumin , prealbumin, transferrin.

If malnutrition present we should advocate enteral / parenteral nutrition.

Routine investigations

- Urine RME.
- Full blood count.
- RBS.
- Serum creatinine.
- Chest Xray
- ECG.

B) Routine preoperative measures

- Follow Standard protocol.
- Use a checklist.
- Prohibit –
  - Solid diet to adult patients for 6h.
  - Clear fluid 4h prior elective anesthesia.
- Removal of hair by depilatory cream.

Measures

- Counselling about –
  - Disease.
  - Comorbidities.
  - Available options.
  - Preferred options.
  - Alternatives.
  - Likely Complications.
  - Special considerations.
  - Answer questions if the patient may have.
- Only then sign the consent form.

Prophylactic antibiotic

Use of antibiotics before surgery.

Indications-

- Clean surgery with prosthesis or implant.
- Clean contaminated.
- Contaminated.

Full course-

- Dirty surgery.
- Clinical infection.

Prophylactic antibiotic

Aim-

- Augment host defense.
- Attack organism before induce infection.

Timing-

- At the time of induction.

Doses

- Usually a single dose at the time of induction.
- Additional doses if-
  - Prolonged surgery (>4 hrs).
  - Major blood loss.
  - Antimicrobials with short half life.

Major blood loss-

- Loss of 1 blood vol. within 24 hrs.
  - Adult- approx. 70ml/kg.
  - Children-80-90 ml/kg.
- Loss of 50% vol. within 3 hrs.
- Loss at a rate of >150 ml/min.

Selection of antibiotics

- Clean procedure no prophylaxis e.g. – varicose vein.
- Cholecystectomy single dose.
- Appendicectomy – a preoperative and two postoperative.
- Skin flora – Flucloxacillin 500.
- Bowel- Coamoxiclave or Cephalosporin and Metronidazole.
- Biliary –Cephalosporin alone.

SPECIFIC PATIENT GROUPS

Gut preparation

Mechanical cleansing.

Chemical cleansing.

Mechanical bowel preparation

Mechanical ways to reduce the bulk of stool.

- PEG.
- Sodium picosulfate (Picolax).
- Hercules preparation.
- Enemas.
  - Enema simplex.
  - Compound enema.
  - Fleet enema.

- 3 days preparation.
- 2 days preparation.
- 1 day preparation.
- No bowel preparation.

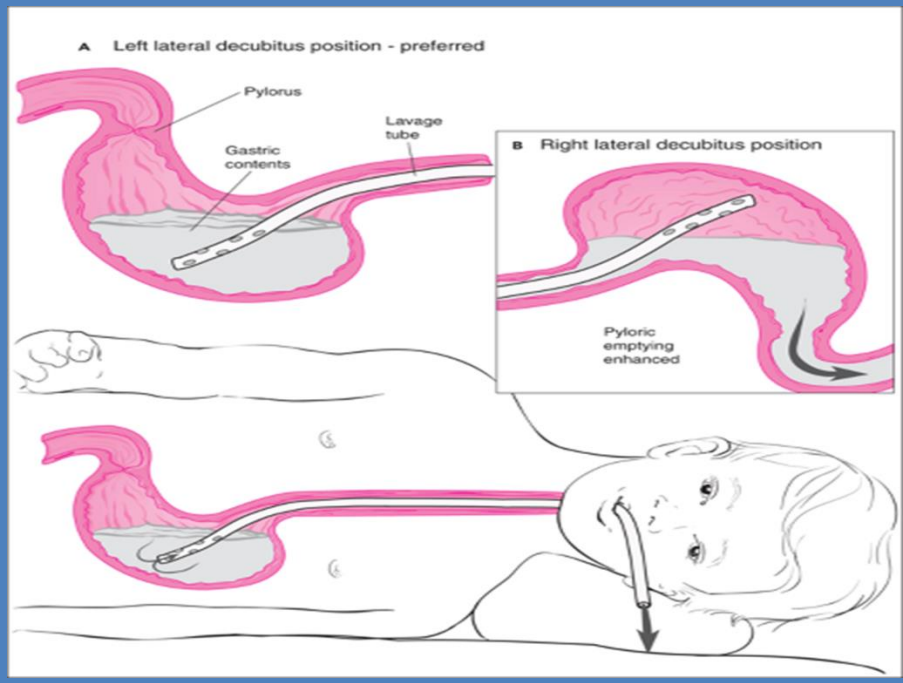
- 4 bottle PEG solution in 4 litre of fluid.
- 250 ml 15 min interval.
- Starting from 10 am.
- Ends at 2 pm.
- Liquid diet upto 8 pm.
- Then start saline.
- Enema if required.

What we do?

- No bowel preparation for-
  - Anorectal procedures.
  - Right sided colonic resection.
  - APR.
  - Emergency procedures.
- Bowel preparation for-
  - Left sided colonic resections.
  - AR.
  - LAR.
  - ULAR.
  - Colonoscopy.

Gastric lavage

- With normal saline.
- Untill clear fluid comes out.
- Benefits-
  - Gastric decompression.
  - Increases muscle tone.
  - Reduce oedema.
  - Reduce the chance of bleeding.
  - Reduce chance of anastomotic leakage.



Anaemia

- The level of haemoglobin will vary according to -
  - Medical status of the patient.
  - Type of surgery planned.
  - Expected blood loss.

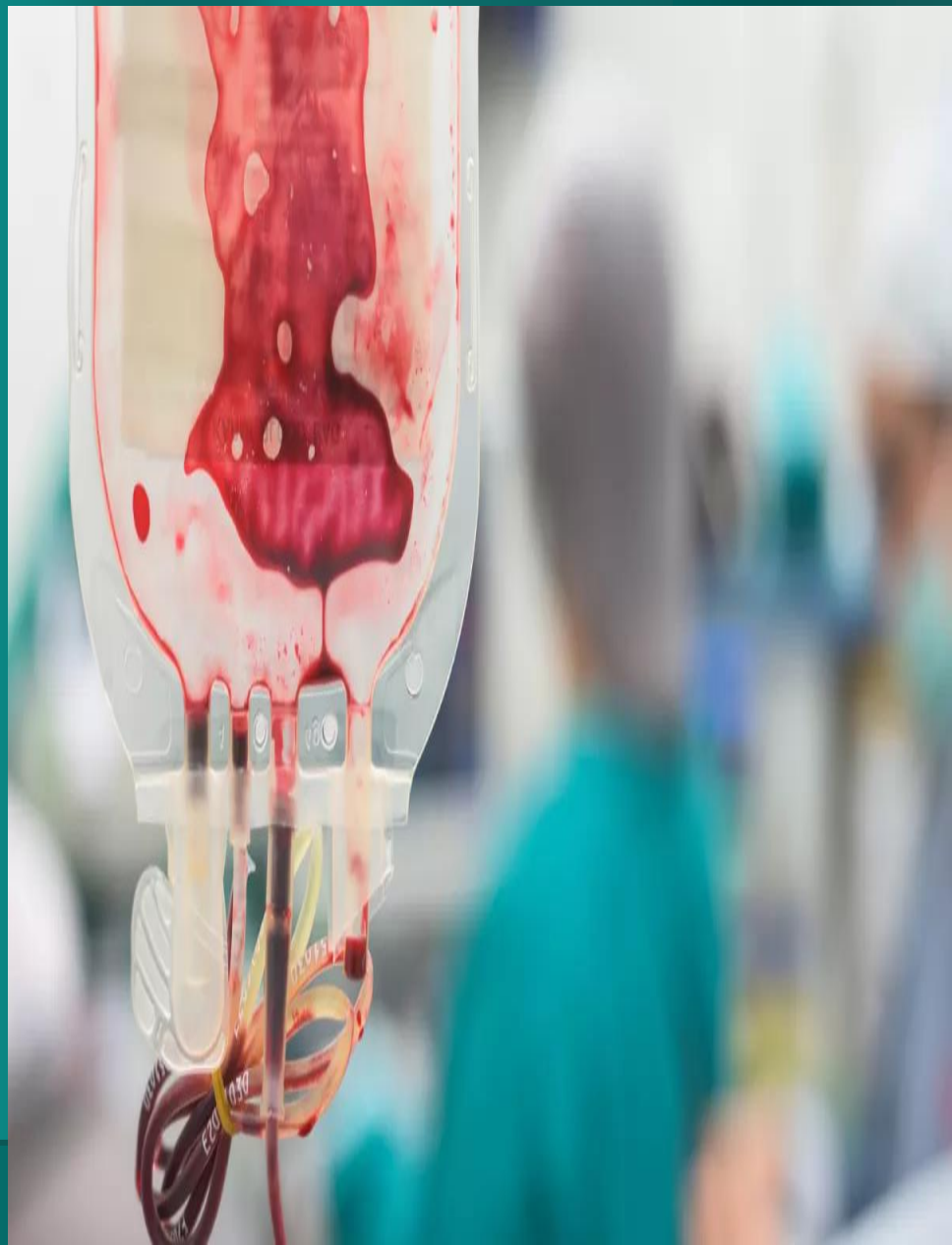
Desired lebel of HGB-

10gm/dl is commonly accepted.

Anaemia in surgical patient

Effects -

- Shock.
- HF.
- RF.
- DIC.
- Coagulopathy.
- Wound infection.
- Delayed wound healing.
- Sepsis.
- Death.



BT in anaemia

Perioperative red blood cell transfusion criteria

Haemoglobin level (g dl^{-1})	Indication
<6	Probably will benefit from transfusion
6–8	Transfusion unlikely to be of benefit in the absence of bleeding or impending surgery
>8	No indication for transfusion

Source: Bailey & Love's Short Practice of Surgery 25th ed

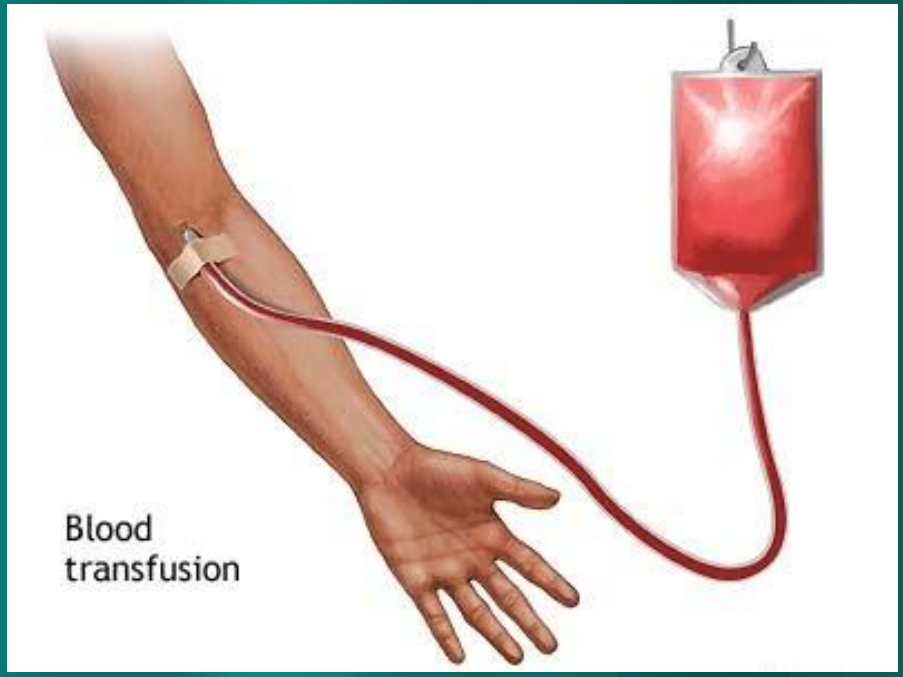
Blood Disorders *(Contd..)*

Anaemia *(contd.)*

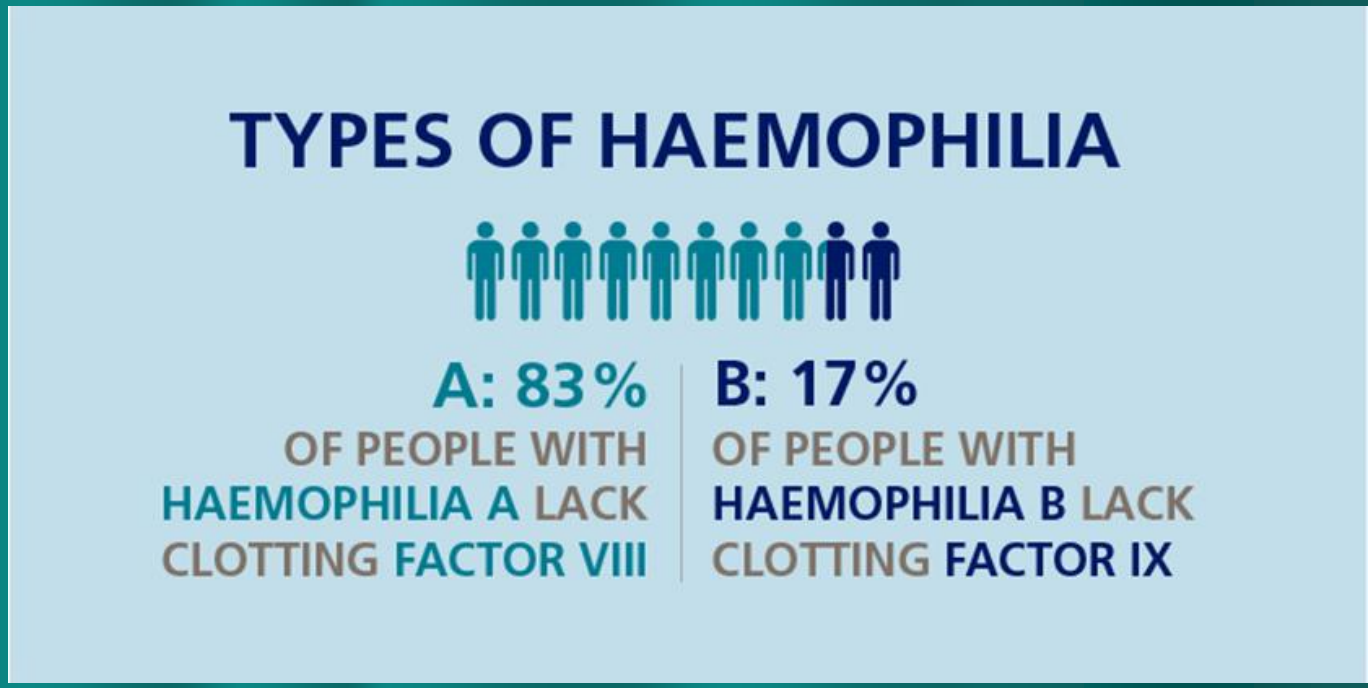
- In colorectal surgery, perioperative blood transfusion may be associated with-
  - More anastomotic leak.
  - More tumour recurrence.
  - More prone to infection.
  - Lowers host's immunity.

When to transfuse blood?

- At least 48 hours before surgery.
- Allow full recovery of the stored RBC' O_2 carrying capacity.



Haemophilia

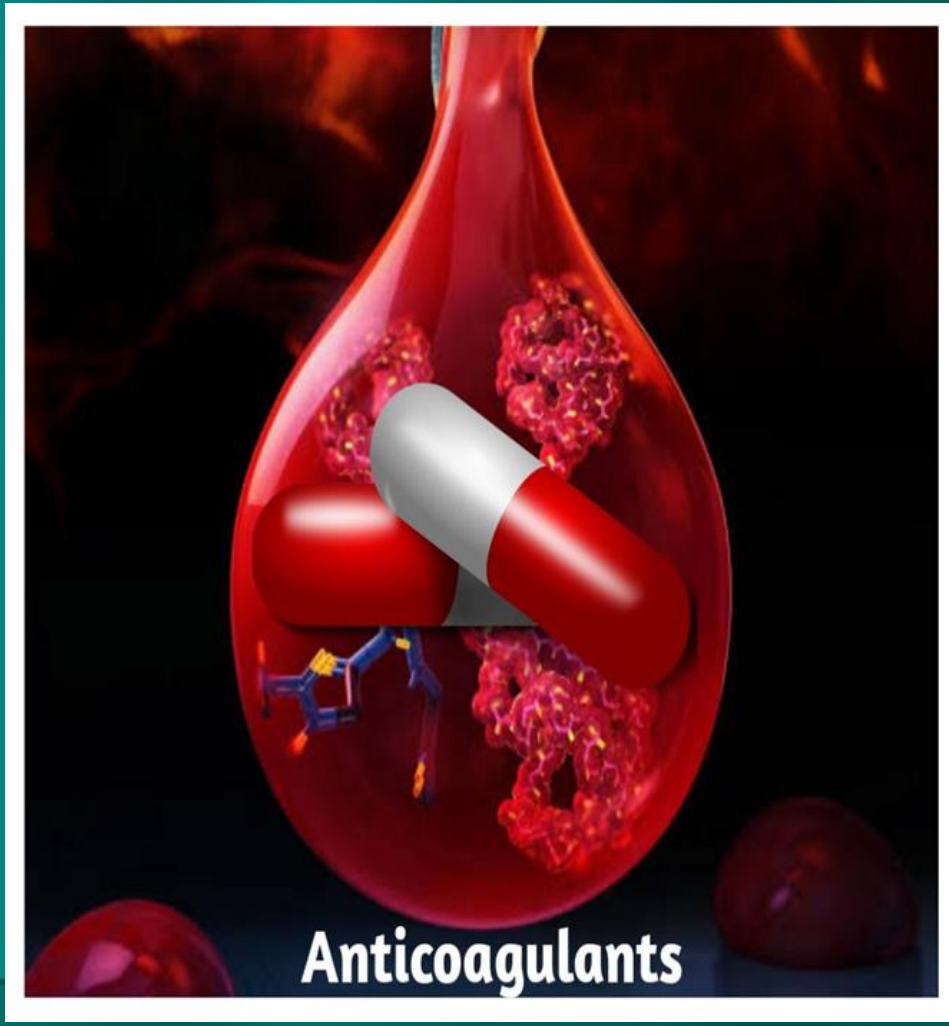


- Detailed family history.
- Coagulation factors must be increased & maintained until healing.
- Cryoprecipitate and fresh frozen plasma or factor IX fraction are used.

Patient with anticoagulant

May cause-

- Bleeding during intubation and operation.
- IM injection must be avoided.
- Subarachnoid / extradural blocks must be avoided.



Patients taking anticoagulants-

- Stop anticoagulants 3 days prior to surgery.
- Replaced by i.v. heparin infusion-
  - Immediate action.
  - Short acting.
  - Easily reversed by protamine sulphate.
- Occasionally 10mg of vitamin K i.m. injection is given daily.
- During surgery- heparin, continuous i.v. infusion of 1000 unit/h or 5000 unit 4-hourly.
- Following operation-
  - Oral anticoagulant can be started concomitantly,
  - Heparin infusion can be withdrawn after 3 days.

PREPARATION OF HIGH RISK PATIENTS :

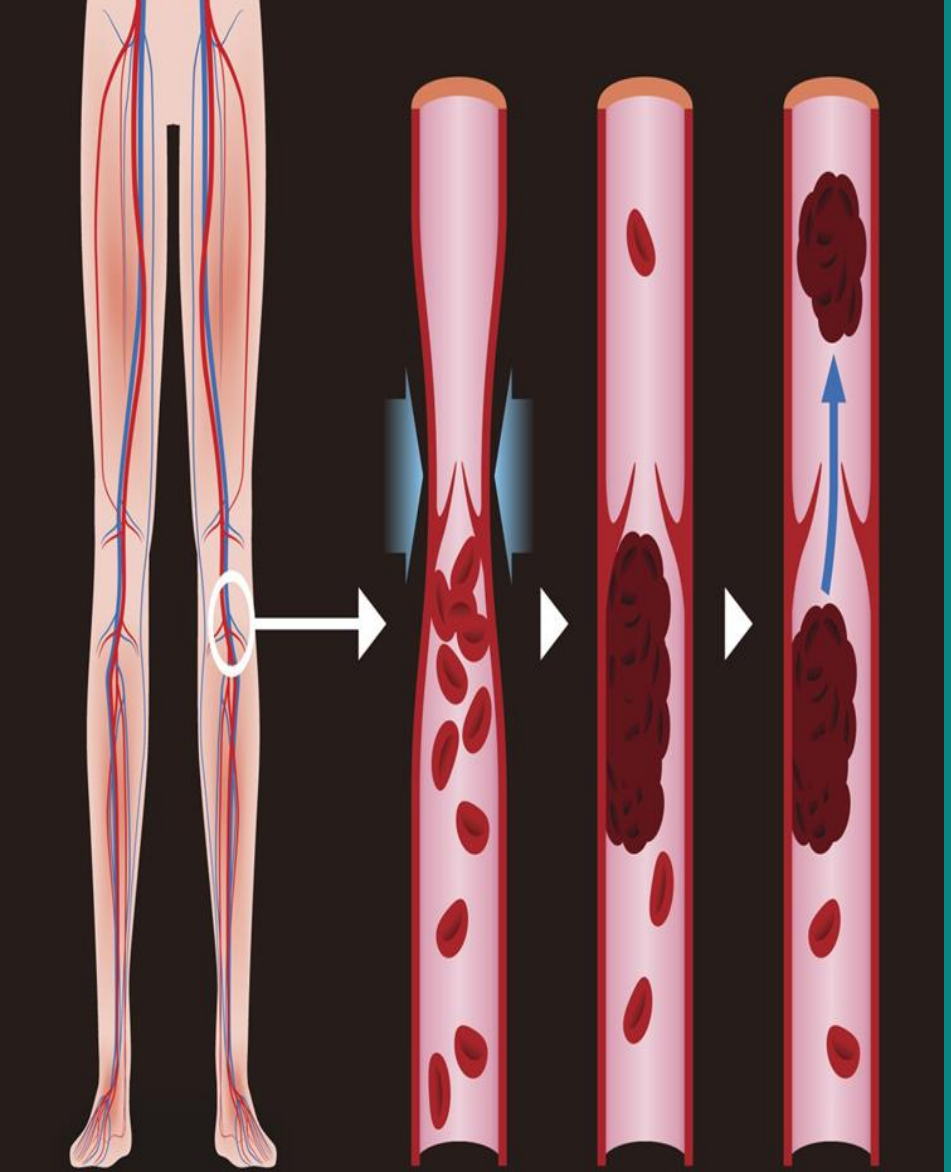
Cardiovascular disease-

- Coronary artery disease.
- HTN with IHD.
- Heart failure.
- Valvular heart disease.
- Arrhthymia.

Respiratory disease-

- Asthma.
- Chronic bronchitis & emphysema.
- Smoking.

Obesity.
DM.
DVT.



Every 1000 operations there will be –

100 DVTs,
10 pulmonary emboli and
1 death.

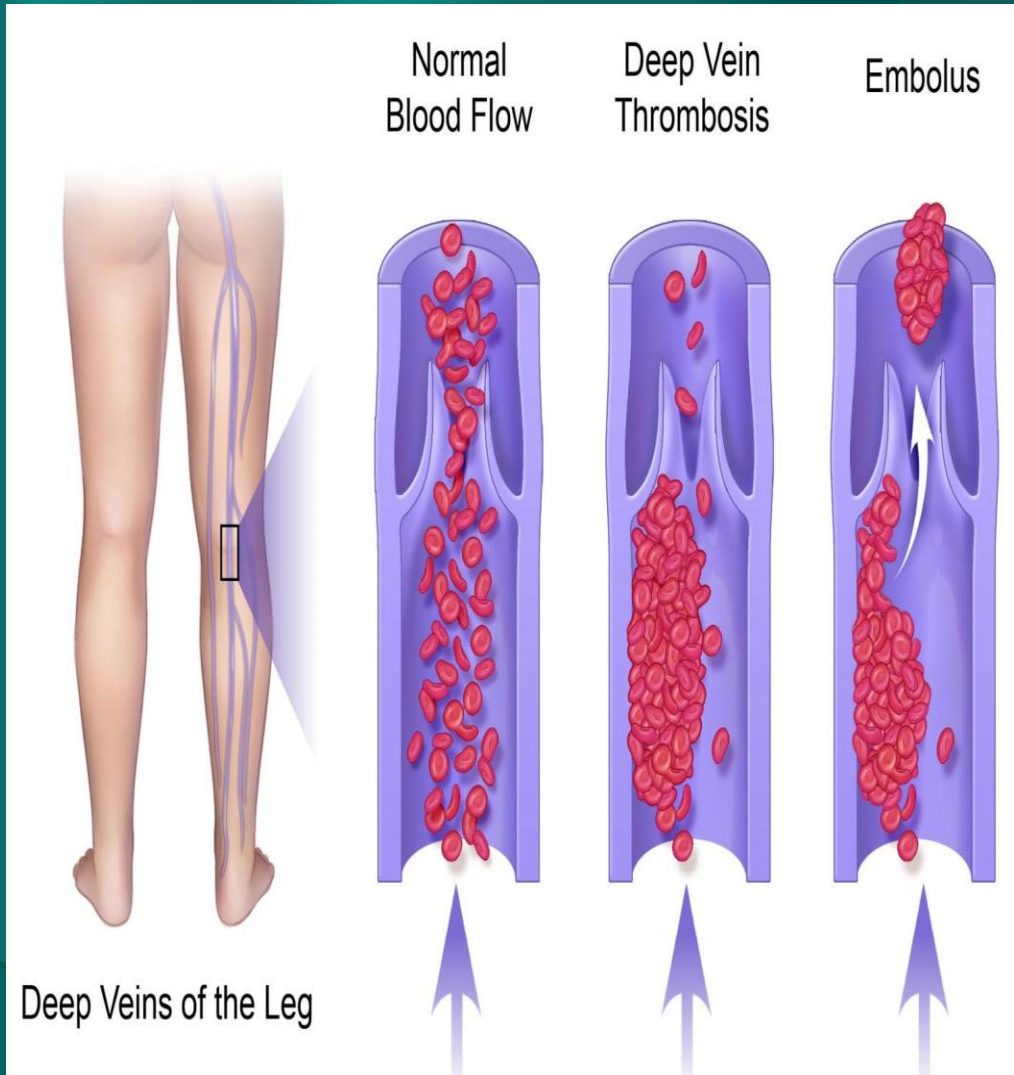
Complication-

pulmonary embolism
Varicosities
non healing ulcers
permanent edema of limb

DVT

Risk factors for DVT-

- Recent surgery.
- Heart failure.
- Immobilization.
- Arteriopathy.
- OCP.
- Cancer.
- Obesity.
- Age > 60 years.



Clinical Feature

Symptoms-

- Pain in calf.
- Bleb in skin.
- Low grade fever.

Sign-

- Homan.
- Moses.

Investigation

- Doppler study
- Contrast Venography

Prophylaxis

- Reduction of risk factors.
- Mobilisation.
- Hydration
- Heparin -5000 unit s/c 2hr. Before and 24 hr. after surgery and 12hrly for 5 days.
- Pneumatic compression.
- Elastic stockinets.

Prophylaxis against DVT contd -

- Subcutaneous heparin decrease incidence of DVT by 50%.

- LMWH-
  - Once daily dose.
  - No need of monitoring.
  - Reduce risk of haemorrhage.

Arterial Hypertension

Desired BP-

- DBP <110mm Hg is satisfactory.
  - 100 mm Hg (BL).
- DBP >100mm Hg is associated with—
  - Increased risk of MI.
  - >risk of bleeding.

When to operate-

- Postpone Surgery for 2-3 weeks for adequate control.

Special caution

- Continue Anti hypertensive.

Type of anti HTN drugs-

- Long acting β-blocker i.e. atenolol is advised.
- If the bowel is disturbed for several days?
  - i.v. atenolol 2-6 mg/hr is recommended.
- Chronic HTN in the elderly-
  - must not be over corrected.
- In severe HTN & urgent surgery-
  - Alpha-blockers i.e. *phentolamine, hydralazine or even sodium nitroprusside* may be used.

Risk of myocardial infarction following surgery-

Time since infarct	Incidence of further infarction after surgery(%)
0-6 months	55
1-2 years	22
2-3 years	6
>3 years	1
No infarct	0.66

Ischaemic Heart Disease

- Medications should be continued till surgery.
- 20-50% of proven IHD- normal ECG.
- Stop smoking at least 12 hours before surgery to reduce-
  - % of carboxyhaemoglobin in blood.
  - minimize CV S/E of nicotine (tachycardia, HTN).

Ischaemic Heart Disease

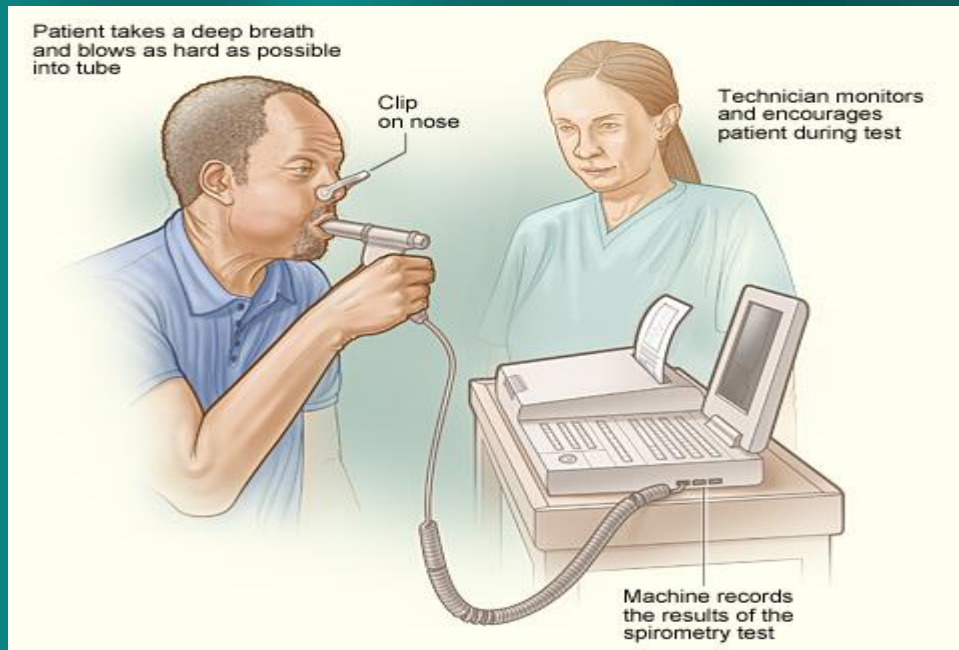
- Heavy premedication during induction.
- Adequate postoperative analgesia.
- ECG monitoring during and after operation.
- Avoid atropine.
- Postoperative supplemental oxygen.

Chronic Respiratory Disease

- Risk of respiratory failure.
- Smokers- 6 times > risk of respiratory complications.
- Stop smoking at least 12-24 hours before surgery.
- Respiratory effect of smoking takes at least 6 weeks to improve after cessation.

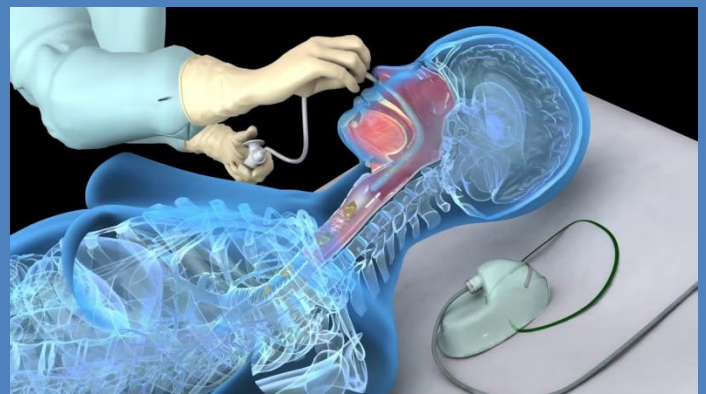
Chronic Respiratory Disease

- Spirometry.
- Blood Gas Analysis- if need for IPPV postoperatively.
- Bronchospasm may be aggravated by-
  - Anxiety.
  - Instrumentation of the upper airway.
  - Foreign materials.
  - Irritants in the upper airway.
  - Pain.
  - Drugs.
- Bronchodilators should be continued till the time of surgery.



Treatment

- Preoperative chest physiotherapy with sputum CS.
  - Sitting up position.
  - Good analgesia.
  - Physiotherapy and
    - » Assisted cough.
    - » Chest percussion.
    - » Naso-tracheal suction.
  - Nebulisation.
  - Thoracic epidural anaesthesia or epidural opiates, or spinal opiate may be useful when the risk of respiratory failure is great.



DIABETES MELLITIS

- Admitted at least 2 days prior to surgery.
- Maintain relative hyperglycemia.

Desired blood sugar-

  - Around 10 mmol/L.

- OHA should be stopped 48 hours before surgery.
- Replaced by short acting insulin.

Diabetec coma

- Hypoglycemic coma.
- DKA.
- Hyperosmolar coma (usually >60 yrs).

Golden rule

Any diabetec patient with DKA VS hypoglycemia give glucose even before glucose measuring.

Management Protocol in Elective Surgery according to severity of Diabetes

	Minor Surgery	Major/ intermediate surgery
Controlled by diet	No specific precautions	Measure blood glucose 4-hourly: if >12 mmol/L start GKI sliding scale regimen.
Controlled by oral agents	Omit medication on morning of operation and start when eating normally postoperatively.	Omit medication and monitor blood glucose 1-2 hourly; if >12mmol/L start GKI sliding scale regimen.
Controlled by insulin	Unless very minor procedure (omit insulin when nil by mouth) give GKI sliding scale regimen during surgery and until eating normally postoperatively.	

Diabetes Mellitus

The GKI Sliding scale regimen-

- Infuse 10% DA 500ml + 10 mmol KCl at 100ml/hour.
- 50 ml syringe containing 50 units of Actrapid insulin in 50ml normal saline (= 1 unit/ml) and connect to glucose infusion.
- Adjust the rate of the syringe driver according to the following sliding scale-

Diabetes Mellitus

Blood glucose (mmol/L)	Regime 1	Regime 2
<4	Off	Off
4-8	1u/hr	2u/hr
8-11	2u/hr	3u/hr
11-16	3u/hr	4u/hr
16-20	4u/hr	6u/hr
>20	5u/hr	8u/hr

Regime 1- suitable for most patients.

Regime 2- if ill, shocked or on steroids.

Operations- best done early on morning list.

Continue i.v. regimen until 1 hour before 1st postoperative meal.

Restart s.c. insulin with this meal

Blood sugar monitoring

Desired range- of 6-12 mmol/L.

At least 2 hourly during surgery.

At least 4 hourly following surgery including plasma potassium levels.

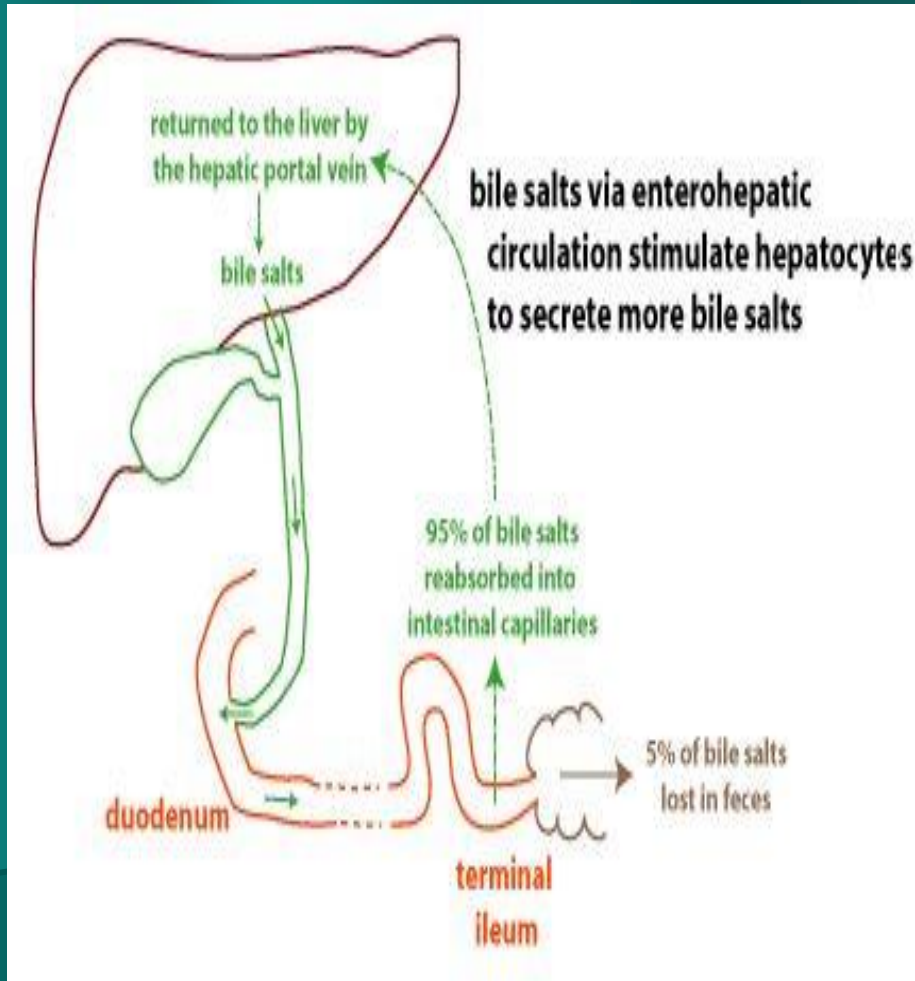
In the perioperative period lactate containing fluids (e.g. Hartmann's solution) should be avoided.

Problems of surgery in jaundiced patient

- Infection.
- Sepsis.
- Bleeding.
- Delayed wound healing.
- Dehydration.
- Liver glycogen depletion.
- Hepatorenal syndrome.

Jaundiced patients-

- Deficient in vitamin k-dependant clotting factors(2,7,9 & 10).
- >Bleeding tendency.
- Should give Inj vitamin-k (10mg IV or IM).
- Fresh frozen plasma to those-
  - Significant coagulation disorder &
  - Who require urgent operation.



Fresh frozen plasma.

- From whole blood.
- Frozen within 6-8 hours.
- Stored at < -20’ C for up to 1 year.
- At < -65’C for up to 7 years.

Preoperative preparation

- Adequate preoperative hydration.
- Continue oral fluid preoperatively until IV fluid replacement.
- Glucose containing diet.
- Parenteral Vit K/ FFP.
- Laxatives.
- Antibiotic prophylaxis.
- Avoid hepatorenal syndrome.

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