Post operative care

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Aim-

- Quick.
- Painless.
- Safe recovery.

Phases

Immediate-

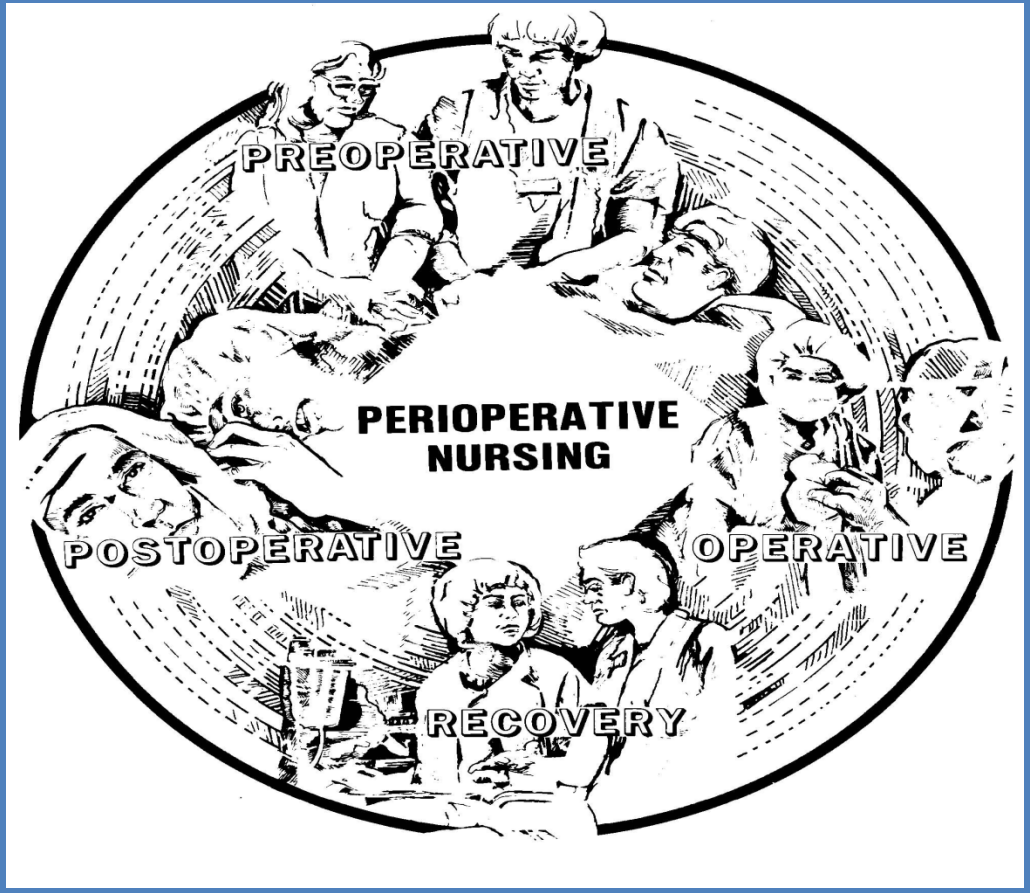
- Phase-I
- Post anaesthetic phase.

Intermediate-

- Phase-II
- Hospital stay.

Convalescent-

- Phase-III.
- After discharge – full recovery.



Aim of phase I & II

- Homeostasis.
- Pain management.
- Prevention & early detection of complications.

Immediate Phase

- Discharge from recovery room to complete stabilization of-
    - Cardiovascular
    - Respiratory.
    - Neurological function.
- Usually takes about 2-4 hours.
- Exception- ICU patient.

Postoperative follow up

- Review of vitals-
- I/O chart.
- Hourly urine output.
- Drain tubes.
- NG tubes.
- Dressings.
- Bowel sound.
- Analgesics requirements.

Criteria of discharge from recovery room

- Fully conscious.
- Respiration & O2 saturation – adequate.
- Normotensive.
- Stable CVS.
- Adequate pain ctrl & not nauseous.

Position & mobilization

- Posture change every 30 min interval until full mobilization.
- Special position if required.
- DVT prevention.

Diet

- Oral as early as possible.
- NPO.
- Liquids.
- Soft diet.
- Normal 0r special diet.

Criteria for oral feeding

- General wellbeing.
- Appetite.
- Passage of flatus & faeces.
- Bowel sound.
- Consider special situation.

ERAS

- Clear fluid upto 3-4 hrs pre anaesthetic.
- Oral as early as possible.
- No NG tube.
- Early mobilization.
- Non-opioid analgesia.
- Key hole surgery.
- Smooth anaesthesia.

Rationale-

- Gut fluid turn over 7-10 L/day.
- Fasting- already malnourished-> complications.
- Early feeding- reduces stress response.

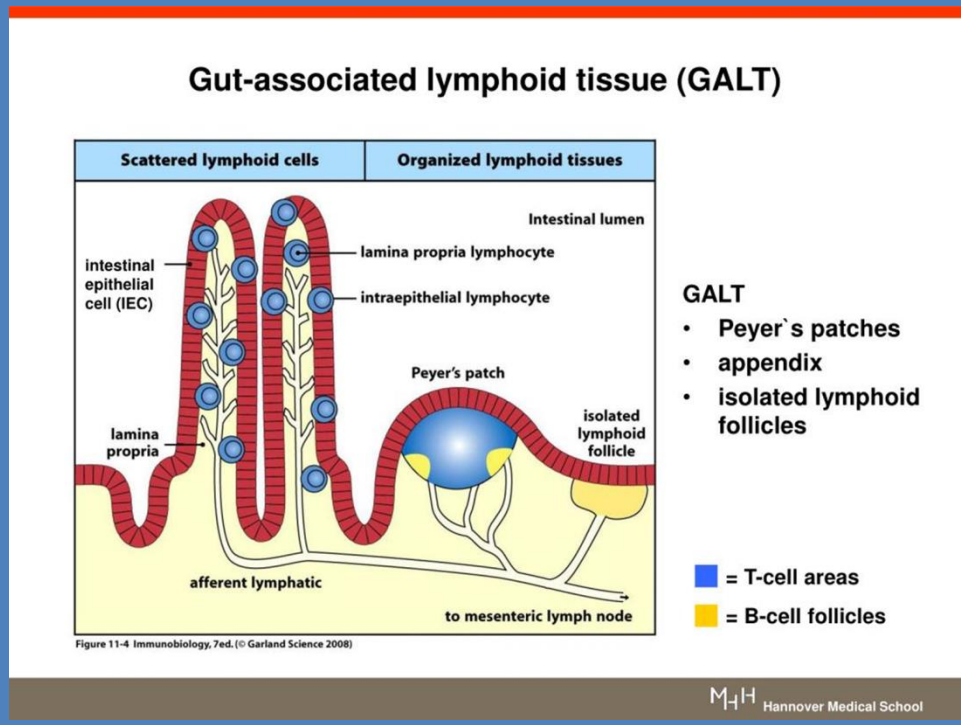
Oral hygiene

Importance-

- Sialedenitis.
- Parotitis.
- Parotid abscess.
- Candidiasis.
- Glossitis.

Bacterial translocation

Colonisation by aerobic Gm(-)ve bacilli
(in gut failure)
↓
Translocation in meseteric lymph nodes
↓
Release of endotoxin e.g.,IL-6,TNF
↓
Cytokine release
↓
MODS, SIRS



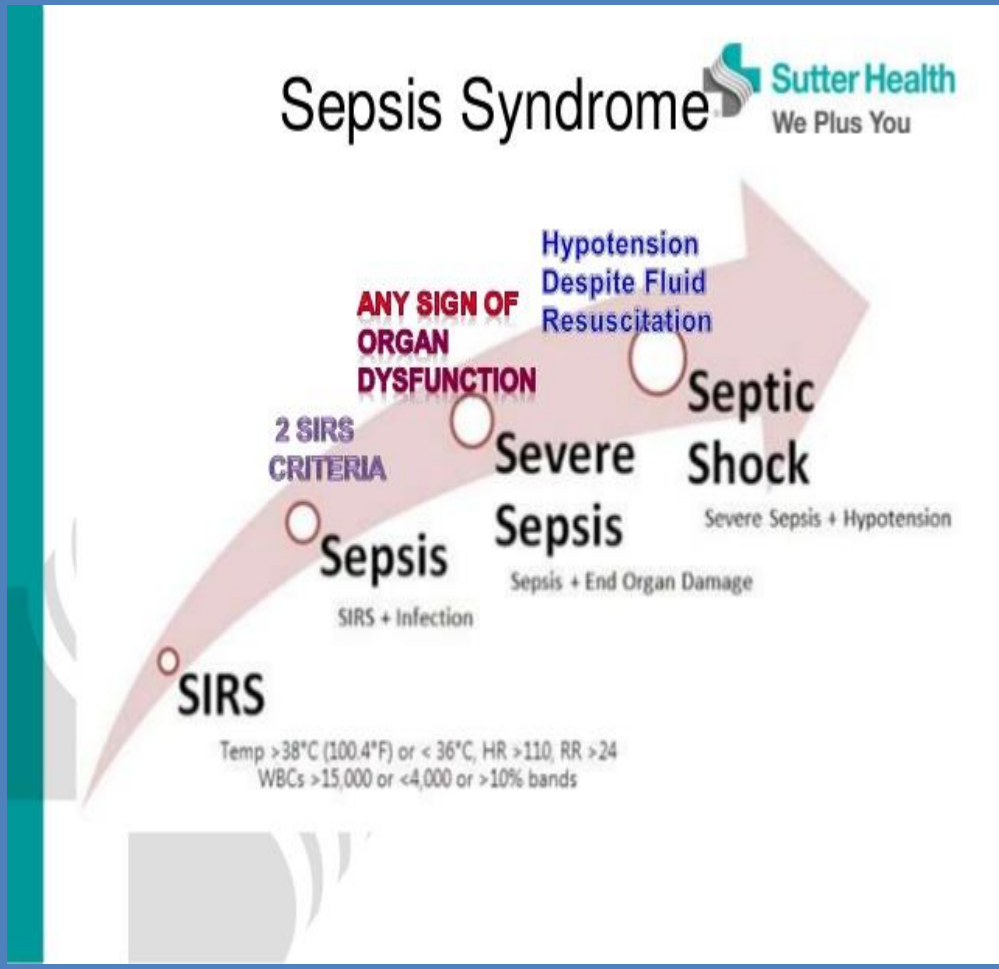
SIRS

SIRS is defined as when there are
2 **of** the of the followings:

-hyperthermia or hypothermia
-tachycardia or tachypnoea
-leukocytosis or leukopenia.

Sepsis is SIRS with a documented infection.

Severe sepsis or sepsis syndrome is sepsis with evidence of one more organ failure.



IV fluids

Maintain intake output charts.

- Daily requirements.
- Losses from GIT & UT.
- Losses from stomas & drains.
- Insensible losses.
- Care of renal patients.
- Care of drainage tubes.

Fluid balance (contd….)

- Operative fluid balance:
- For the 1st 36 hrs postoperatively there is water and sodium retention lasting up to 3-5 days.
- Operative blood loss up to 500 ml can be replaced with saline, if blood loss > 1litre, consider blood transfusion.
- Give a unit of FFP for every 4-6 units of stored blood transfusion.

Fluid balance (contd....)

- Operative fluid balance:

  In intra-abdominal surgery give up to 2 litres of Hartmann's solution, it compensate for starvation, ECF loss, evaporation and blood loss

- Post operative fluid:

  - Basal requirements plus 1mmol of Na^+ &
  - 1 mmol K^+ plus
  - additional blood or colloid if significant wound drainage.

Electrolyte balance (contd....)

POTASSIUM BALANCE:

- Total amount is 3500 mmol (¾ of total potassium found in skeletal muscle)
- 98% of potassium are in ICF
- 2% in ECF
- Average daily requirement is 1 mmol /kg/ day.
- Start from 3rd POD if NPO.

Hypokalaemia:

- **Treatment:**

- Oral potassium replacement 2 gm 6 hourly.
- Intravenous K^+ administration - 40 mmol / day after dilution in saline.

- Rules of giving potassium:

- Urine output 40 ml /hr
- Not more than 40 mmol /day
- Not faster than 40 drops / min.

Post operative Pyrexia:

Any postoperative elevation of body temperature more then 1°C above normal should be considered significant and the cause should be investigated.

Mnemonic of Causes-

5 W's.

- Wind, POD1-2: the lungs, i.e.
  - pneumonia,
  - aspiration, and
  - pulmonary embolism.
  - Once attributed to atelectasis, but this has been shown to be inaccurate.
- Water, POD3-5:
  - urinary tract infection, related to indwelling catheter (during surgery or currently i.e. Foley catheter)
  - Thrombophlebitis.
  - Drain tube infection.
- Walking (or VEINS, which then sounds like "Weins"), POD4-6:
  - deep vein thrombosis or
  - pulmonary embolism
- Wound, POD5-7:
  - surgical site infection.
- Wonder drugs or “What did we do?”, POD7+:
  - drug fever,
  - infections related to intravenous lines

Incidence

- 40% major surgery -suffer pyrexia.
- 80% of which have no specific aetiology.
- Rest 20% - Infectious cause.
- Infection is the only headache of post operative pyrexia.

General Management

- Most patients require no specific treatment.
- Subsides spontaneously.
- Infection requires treatment.

Pulmonary problem

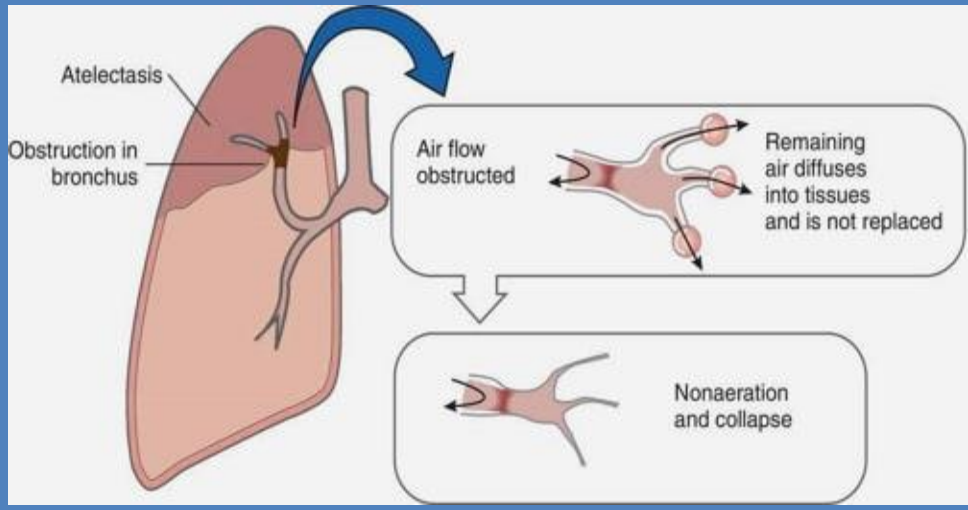
- 1st & 2nd POD.
- Atelectasis & pneumonia.
- Early mobilization.
- Respiratory physiotherapy.
- Adequate fluid management.
- 3 A
    - Antibiotics.
    - Analgesics.
    - Areation.

Pulmonary care

- FRC & VC reduces upto 40% pre-op level.
- Go up slowly upto 60-70% by 6^{th} -7^{th} POD.
- Aggravated by-
    - Obesity.
    - Smoking.
    - Pre- existing lung diseases.
    - Elderly.
    - Pain.
    - Abdominal distension.

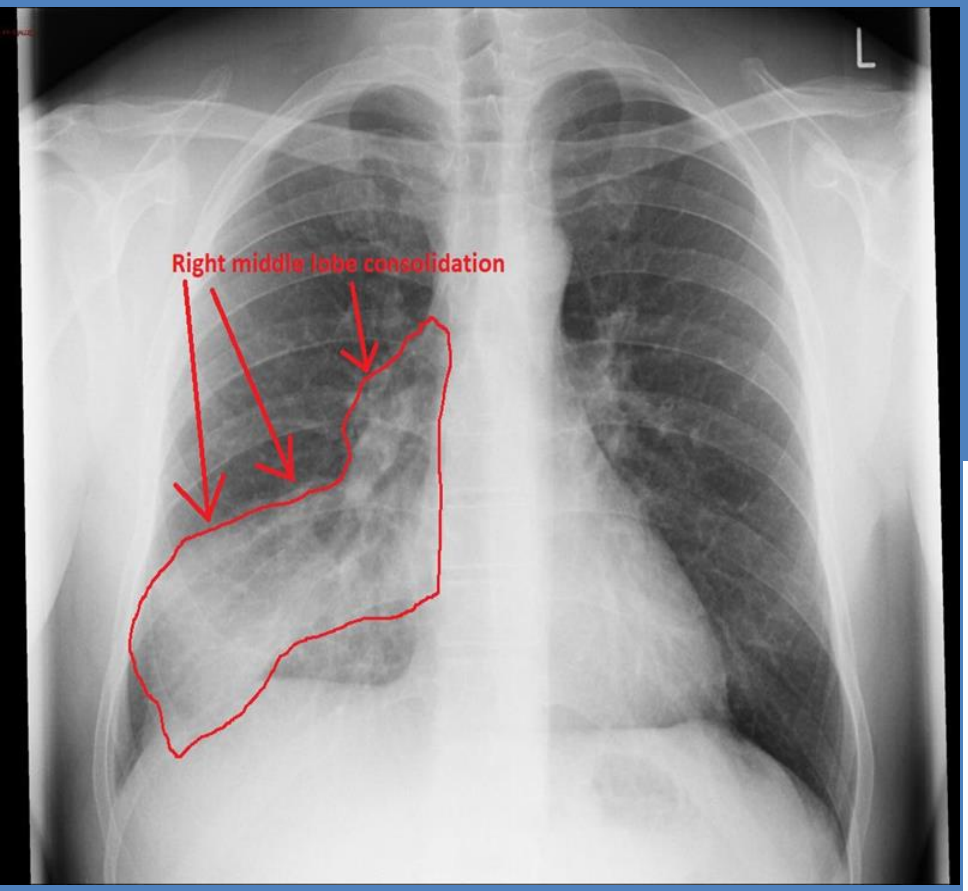
Atelectasis

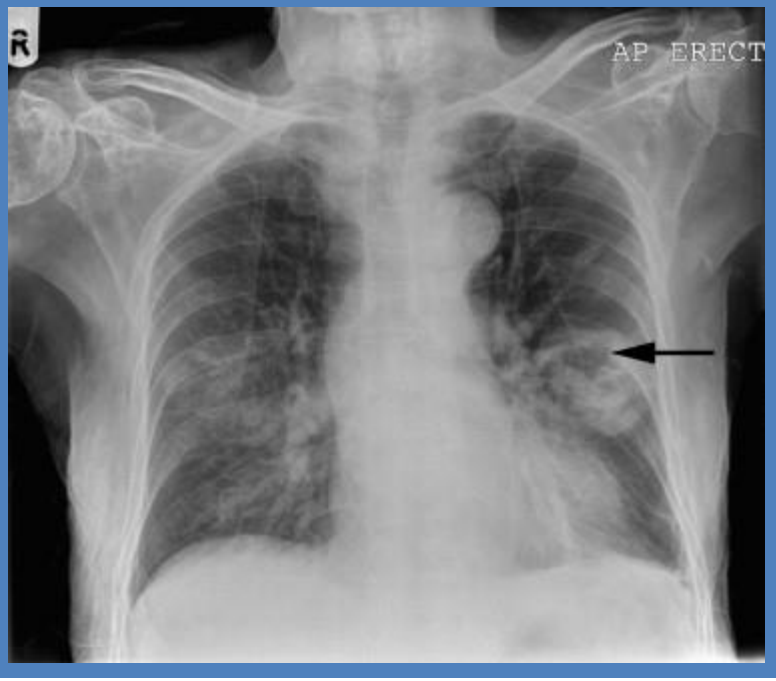
- Complete or partial collapse of the entire lung or area (lobe) of the lung.
- Alveoli within the lung become deflated or possibly filled with alveolar fluid.



25% of GI surgery is associated with it.

Segmental
Focal patchy





Old age
Smoking
Obesity
Previous respiratory disease

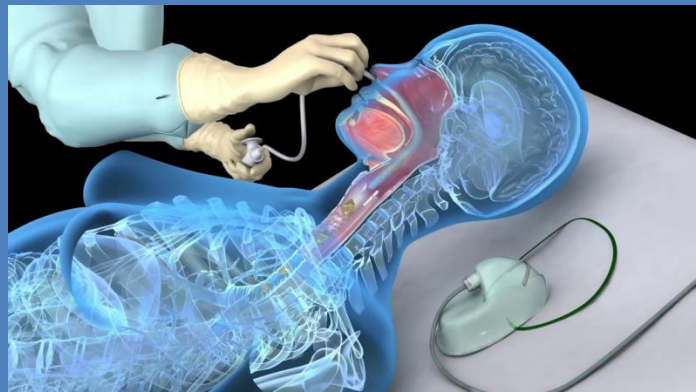
Segmental (or subsegmental) consolidation

Prevention

- Early mobilization
- Freq. change of posture
- Encourage coughing
- Breathing exercise.

Treatment

- Assisted cough.
- Chest percussion.
- Naso-tracheal suction.
- Rx of COPD if present



Dressing change

- Aseptic technique.
- Emergency surgery- 3rd POD.
- Routine surgery- 4th or 5th POD.
- Soaked- change as early as possible.

Types of drain

- Closed drainage- air tight circuit.
- Open drainage-drains out on a dressing.
- Suction drainage-uses pump or mechanical device.

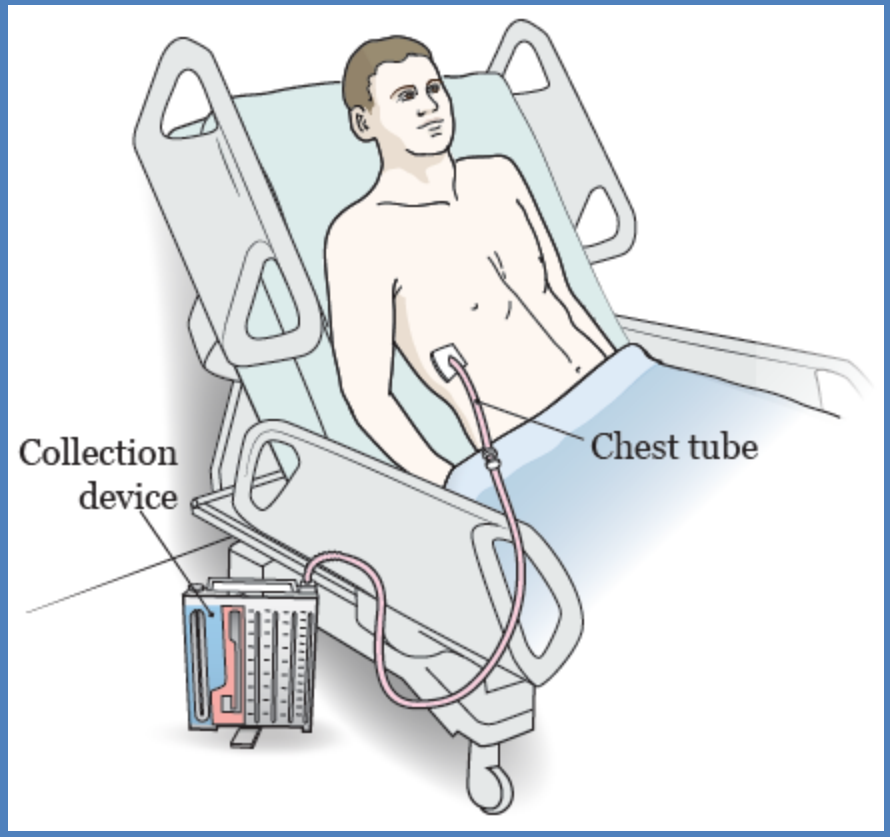
Principles of drain

- Open drain- gravity.
- Semi open drain- capillary action.
- Closed drain- utilize suction.

Siphonic action

Special drains

- Chest drains.
- T- tube drains.
- Guided drainage.



Drain removal

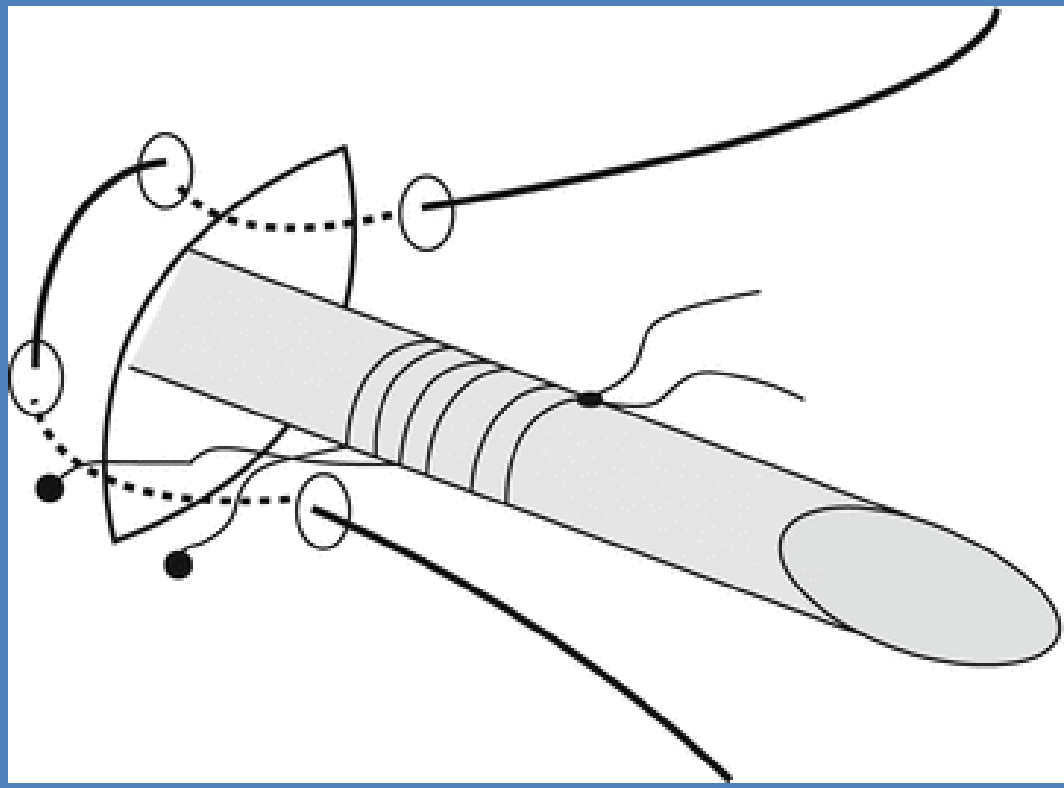
- By 7 days only 20% drains remain functioning.
- Raise wound infection.
- Removed as soon as possible.
- Not to remain in contact with anastomotic sites.

Principles of drain removal

- Thyroidectomy –perioperative bleeding-after 24 hrs.
- Mastectomy- serous collection-after 5 days.
- Infection-until infection is subsided.
- Colorectal anastomosis- 5-7 days.
- T – tube after 10 days.

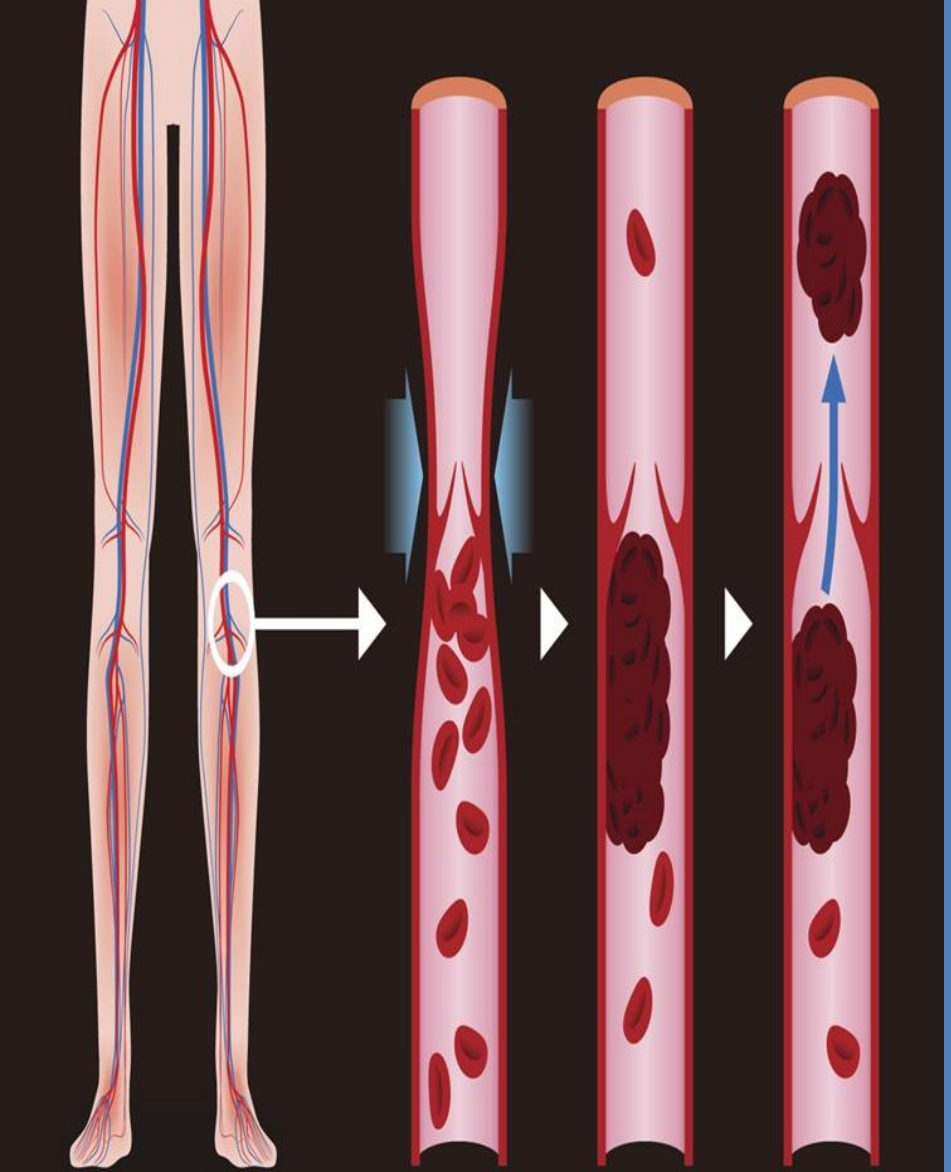
Chest drain

- General wellbeing.
- No respiratory distress.
- No air leak.
- Drainage <50 cc.
- Clear serosenguineous fluid.
- CXR- full expansion of lung.
- Non functioning drain tube.



Removal of abdominal drain

- No drainage or
- Drainage <25 ml/day.
- Serous or serosenguineous fluid.
- Non functioning drain.
- Anastomosis- usually upto 1 week.
- Can be shortened 2 cm /day allowing the site to heal gradually.



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

Clinical Feature

Symptoms-

- Pain in calf,
- bleb in skin ,
- low grade fever

Sign-

- Homan,
- Moses

Investigation

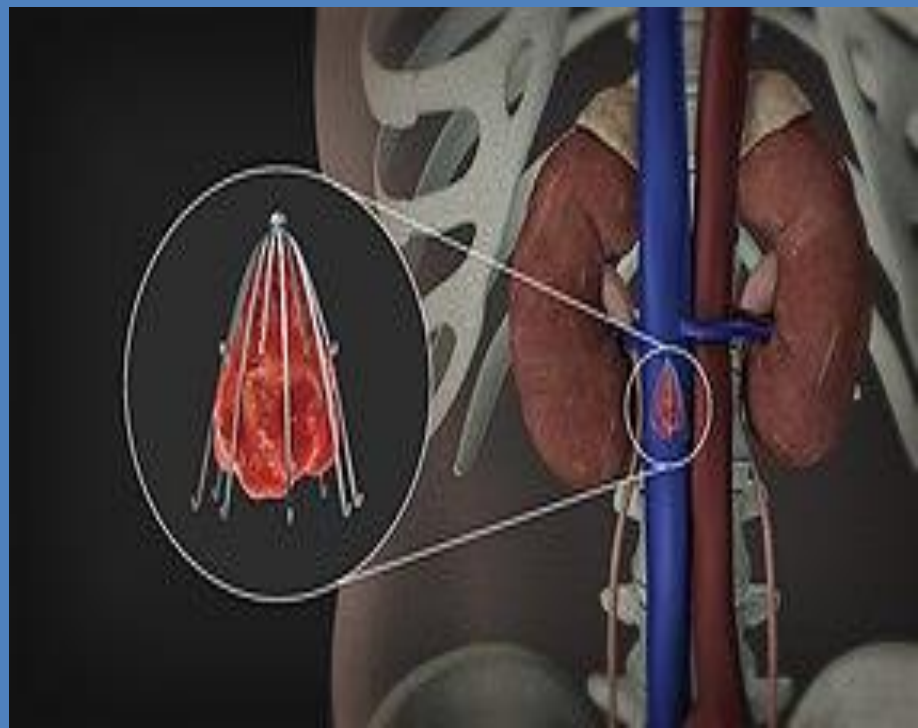
- Doppler study
- Contrast Venography

Prophylaxis

- Early mobilisation
- Hydration
- Heparin -5000 unit s/c 2hr. Before and 24 hr. after surgery and 12hrly for 5 days.
- Pneumatic compression.

Treatment

- Bed rest
- Elevation of limb
- Heparin -10000 unit I/V bolus with 30000 to 45000 unit /day. (INR 2-3) for 7-10 days
- Warfarin – 10mg 12 hrly for 6-12 months starting 2-3 days before heparin withdrawl.
- IVC filter
- Palma and May- Husni operations.



UTI

Nosocomial usually.

- Catheter,
- previous urinary contamination ,
- retention contribute to UTI.

Symptoms-

- Fever,
- dysuria,
- tenderness in flank.

Investigation-

- Urine R/M/E.

Treatment.

- Hydration,
- Antibiotic ,
- Drainage.

Thrombophlebitis

Factors-

- Cannula size,
- solution infused,
- bacterial presence,
- venous thrombosis .

Triad of phlebitis-

- Tenderness,
- Edema ,
- Induration.

Prevention

- Aseptic technique.
- Change tube every 2 days.
- Insertion site change every 3 days.
- Hypertonic solution to be given in larger veins.
- Use superior extremity veins .

Treatment

- Removal of cannula.
- Moist heat to improve circulation.
- Elevation of limb to improve venous return.
- Analgesics.

Wound infection

- Superficial surgical site infection.
- Deep surgical site infection.
- Organ space infection.

Wound infection

Major surgical infections-

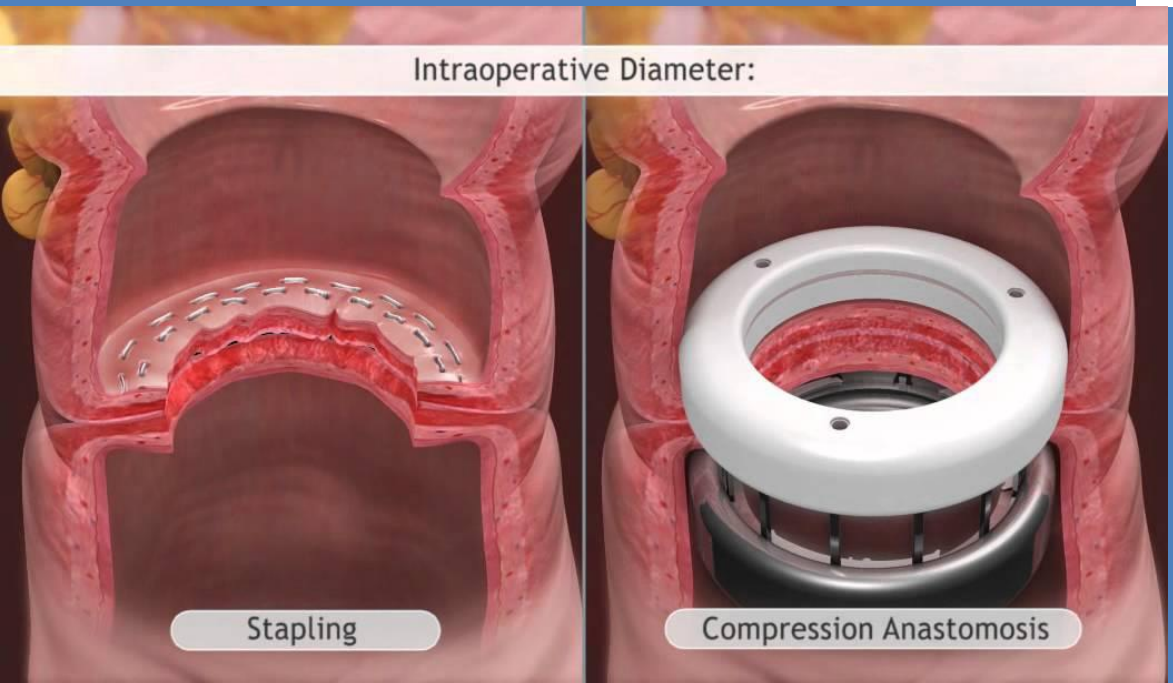
- significant quantity of pus.
- delayed return to home
- systemically ill.

Minor surgical infections-

- discharge of small amount of pus or serous fluid only.

Anastomotic leakage

- Small intestine,
- Ileocolic &
- Ileorectal anastomosis- safe.



- Oesophageal,
- Pancreaticoenteric
- Colorectal anastomosis

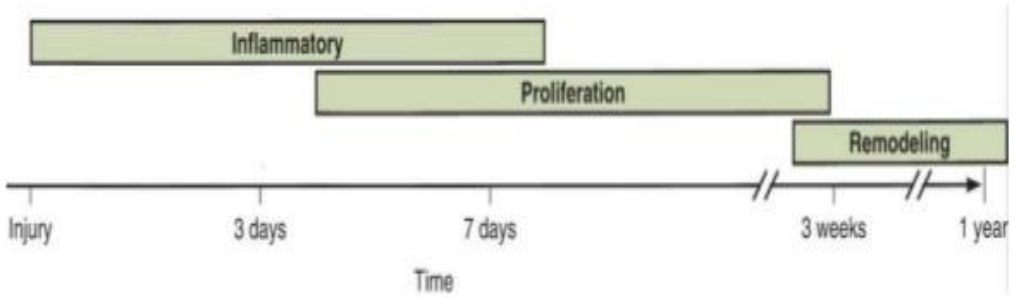
-considered high risk.

Healing of anastomosis

- Inflammatory / Lag phase.
  - 0-4 days.
- Proliferative phase- Fibroplasia.
  - 3-14 days.
- Remodelling / maturation phase.
  - >10 days.

Intestinal healing

- Occurs like other tissues
- Hemostasis & Inflammatory phase
- Proliferative phase
- Remodelling & maturing phase

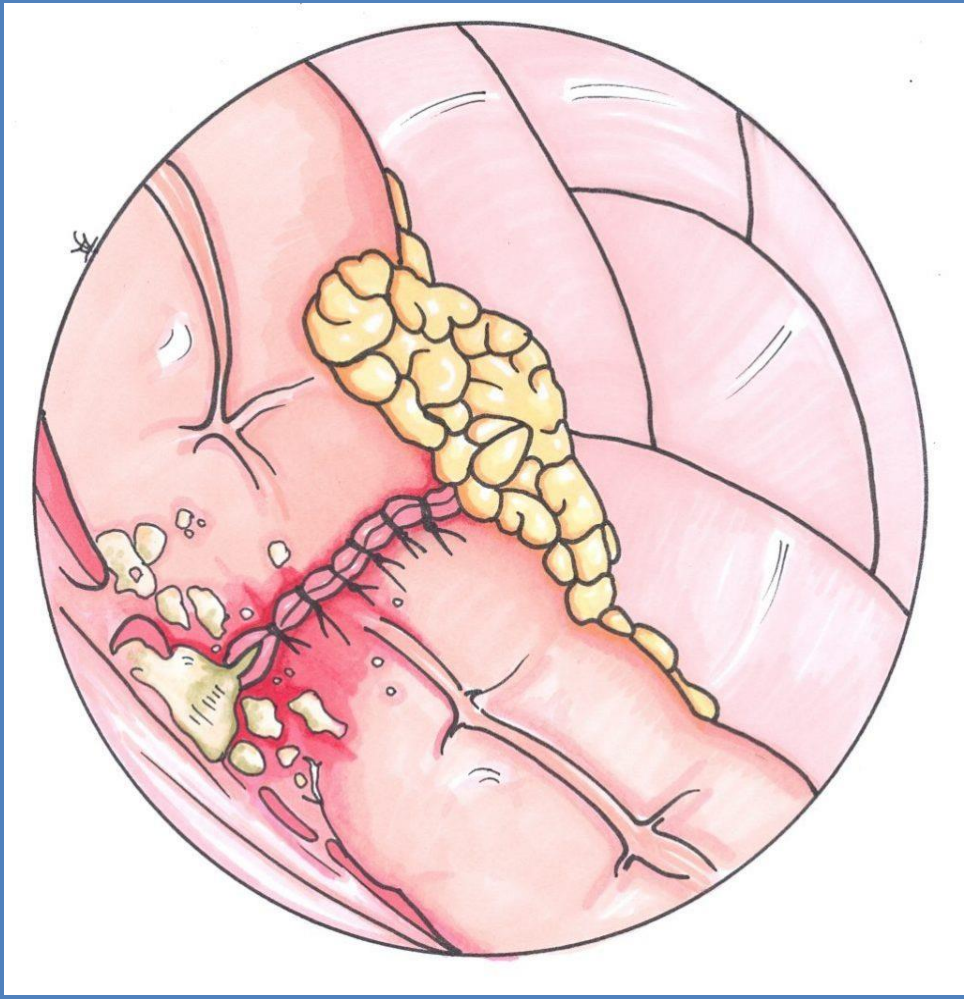


Anastomotic strength

- From collagen of submucosa.
- Low during the 1st POD.
- Early strength- on suture or stapler.
- Weakest- 3- 4th POD.

Grading of anastomotic leakage

- A- leakage with-
  - Minimal or
  - No clinical impairment.
  - Require no active intervention.
- Leakage require-
  - Active intervention.
  - But manageable without surgical intervention.
- Leakage require-
  - Repeat surgical intervention.
  - Often require diversion.



Principles of anastomosis

- Good blood supply.
- Tension free anastomosis.
- Air tight & water tight.
- Anastomosis with healthy, non diseased bowel ends.

Thank you