A NEET SS (SURGERY) PREPARATION COURSE
BY MARROW, WITH A TEAM OF SELECTED
SUPER-SPECIALITY FACULTY

SURGERY NEET SS

GENERAL

SURGERY-1

PREPARATION COURSE

BY MARROW, WITH A TEAM OF
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CONTENT

PATIENT SAFETY, OT ZONES AND SURGICAL POSITIONS

Events in patient safety 00:01:35

There are three events recorded for patient safety :

1. Adverse event :

   Unwanted event, results in harm to the patient.

2. Near miss event :

   The harm is prevented due to timely intervention.

3. No harm events :

   An unwanted act occurs, however no harm to the patient.

The near-miss event data is the most reliable data regarding patient safety mechanisms.

Consent 00:06:34

Due to the use of checklists, the mortality rate decreased from 1.9% to 0.2%.

Consent : The consent should be in a written format.

The consent must include :

- Identification : Name, age, MRD no.
- Diagnosis
- Procedure planned
- Surgeon
- Description
- Patient-specific complications
- Procedure specific complications [any complication with incidence >1%]
- Benefits
- Alternate procedures
- Sign of the patient, surgeon, witness.

If the patient is a minor : Consent should be obtained from a substitute decision-maker.

If the patient is a foreigner : Interpreter consent should be obtained.

Intravenous [IV] lines 00:13:38

Colour codes :

- Orange : 14 G – widest bore with fastest flow rate
- Grey : 16 G
- Green : 18 G
- Pink : 20 G
- Blue : 22 G
- Yellow : 24 G – narrowest bore with least flow rate

The MC complication : Superficial thrombophlebitis.
Treatment : Change of cannula.

With sugar-rich solutions [TPN] : Increased chances of thrombophlebitis.

TPN : Total parenteral nutrition.

In trauma patients : Minimum two 18 G [green] IV lines should be used. [A wider bore cannula can be used if available].

Superficial thrombophlebitis

Surgical safety checklists 00:20:03

It has three components.

1. Sign in : From ward to the OT complex
   - Confirm identity
   - Written consent
   - Site marking : Preferably by surgeon
   - Allergies
   - Prophylactic antibiotics.
2. Timeout : It is done by the circulatory nurse.

   Before induction/skin incision :
   - Introduction
   - Surgeon : Name of surgery proposed
     Approximate time of the procedure
     Anticipated blood loss.
   - Anaesthetist : Any specific concerns

Prophylactic antibiotics.

- Scrub nurse : Sterility maintenance.

3. Sign out : Before skin closure
   - Surgeon : Name of the actual surgery performed
     Any concerns regarding patient
     Any equipment issues.
   - Nurse : Gauze count and equipment count
     Specimen labelling [if any].
   - Anaesthetist : Any concerns regarding patient
     Actual blood loss.

Each phase of the checklist is signed by : Nurse, Anaesthetist, Surgeon.

Blood loss during surgery

00:32:45

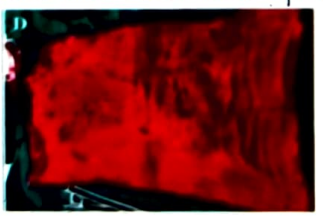
- Soaked mops and gauze pieces count.
  A completely soaked big mop : 100 cc.
- Blood in the suction drain.
- Irrigation fluid used.
- A fist full of clots : 500 cc of blood.

Actual blood loss = [mops soaked + blood in the suction] − irrigation fluid.

The mops/gauzes are lined : The lines are radiopaque.

Advantage : To locate the missing mop/gauze using C arm.

Soaked mop :



OT zoning

00:37:40

Protective zone	Clean zone [connects protective zone to aseptic zone]	Aseptic zone	Disposal zone
• Changing rooms • Transfer bay • Pre and post-op rooms • ICU/PACU	• Equipment storeroom • Maintenance workshop	OT	All wastes are disposed of.

OT positions

00:40:04

Supine :

MC position used for abdominal, breast surgeries.

Neutral :

The head end and foot end of the table are at the same level.

Trendelenburg position :

The foot end of the table is raised.

It is used in pelvic surgeries.

Reverse Trendelenburg position :

The head end is raised and the foot end is lowered.

It is used in laparoscopic cholecystectomy, sleeve gastrectomy.

Prone position :

It is used for spinal surgeries, pilonidal sinus surgeries.

Lithotomy position :

It is used for obstetric, gynaecological, perineal, urological procedures.

Improper padding of the stirrups or over abduction : Leads to common peroneal nerve injury.

Lateral/Kidney position :

It is used for thoracotomy, pyelothotomy, nephrolithotomy and nephrectomy.

Over abduction : Leads to a Brachial plexus injury.

Sitting/ Fowler's position :

It is used for cranial surgeries [posterior cranial fossa], breast reconstruction surgeries.

Advantages : Relatively bloodless field. Better exposure.

Disadvantage : Increased risk of air embolism.

Prevention : Ligating the veins before cutting.
Continuous irrigation with water.

Rose position :

It is used in thyroid surgeries.

A towel roll is placed below the shoulder blades [neck extension].

30° head elevation.

Increased risk of air embolism.

Active space

- Air embolism :

  Minimum 20 cc of air is required to cause an air embolism.

  If air embolism occurs, the patient is put into Durant's / recovery position.

  It is the left lateral decubitus position [right side and foot end are up]. The air can be aspirated through a central line or direct aspiration through the heart.

Laparoscopic cholecystectomy :

The right side is up

Reverse Trendelenburg position is used.

Disadvantage : The CO_2 used in the surgery

↓

Enters beneath the right dome of diaphragm

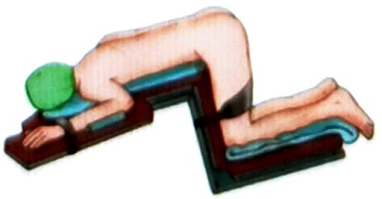
↓

Irritates the diaphragm causing right shoulder tip pain.

a. Supine, b. Trendelenburg position, c. Reverse Trendelenburg position, d. Lithotomy position, e & f. Lateral/Kidney position, h. Prone position, i. Sitting/ Fowler's position.

JackKnife position :

It was earlier used for haemorrhoid & fissure surgery. It causes positional asphyxia. Therefore, not used any longer.



Lloyd Davis positions :

It is a Trendelenburg + lithotomy position.

It is used for APR [abdominal perineal resection] and LAR [low anterior resection].

SURGICAL BLADES AND ENERGY SOURCES

Surgical blades

00:00:26

- No 11. Pointed/ Stab blade : Used for Incision and drainage
  Also used for arteriotomy (incision in the artery).

- No 12. Curved blade : For suture removal.

- No. 10, 15, 20, 21, 22, 23 :
  These blades have a belly which is the curved portion of the blade.
  - Blades with belly are used to make incisions.
  - The belly of the blade is the sharpest portion of a blade.

Bard Parkers Handle :

Used to hold the blade like a pen or to palm it. It is the correct way of holding the blade.

Always use a mosquito forceps to hold the blade while mounting it on the BP handle.

Passing sharp objects in OT :

- Ideal : Kidney tray.
- Not available : Pass the needle with the pointed end towards you.

Active space

Making an incision :

- Blade perpendicular to skin, otherwise there will be undermined or bevelled edges.
- Far to near.
- Opposite side to same side (for eg : a left handed surgeon will make incision from his/her right to the left)

The blade is mounted on the BP handle with help of a forceps ex mosquito forceps to avoid accidental injuries. the BP handle is always passed in the Kidney tray.

A stab incision is made at the point of maximum tenderness and fluctuation and with the No 11 blade and then taken out, First the blood comes out then the pus starts draining out.

Factors while planning an incision :

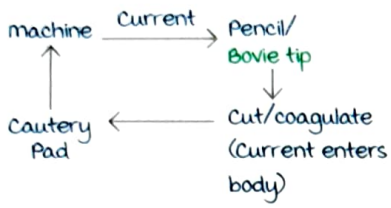
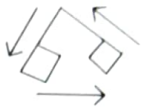
- Skin tension lines (Langer's lines) represent orientation of dermal collagen fibres and incisions should be placed parallel to them, then wounds will heal better.
- Anatomical structures : must be careful not to injure surrounding neurovascular structures.
- Cosmetic factors.
- Adequate access.

Energy sources 00:10:00

The most commonly used energy source is cautery.

Monopolar cautery

Bipolar cautery

monopolar cautery	Bipolar cautery
Resembles a pen.	Resembles a prong.
Can be used for cutting and coagulation. Yellow button : Cutting. Blue button : Coagulation.	Only coagulation.
Principle :  	Principle :  Current comes from one blade (electrode) and passes onto the other blade, thus completing circuit.
Cautery pad needed. Requires large area of contact To be placed in well vascularized area with less hair.	No need for cautery pad.
Cannot be used in patients with cardiac pacemakers, structures with end arteries or close to neurovascular structures.	No lateral spread of current : Safe for use close to vital structures, end arteries and in patients with pacemakers.

Scenarios in monopolar cautery :

1. Technician fails to attach cautery pad : Cautery will not work.
2. Small cautery pad is placed / only small area of contact : Burns at cautery pad site (due to increased heat).
3. Spread of current through the body interferes with cardiac conduction : In patients with cardiac pacemaker, interference in conduction is significant hence either monopolar is avoided or mode of pacemaker needs to be changed (to avoid repeated shocking of the heart by the pacemaker in response to the abnormal rhythm caused by the cautery).
4. Pedicle or narrow base : Channelling of current occurs.
   Cautery given at the tip of the pedicle can cause channelling of current to the base causing burns at the base.
   Hence in surgeries where there are end arteries like ear lobule or penile surgeries or surery, we avoid monopolar cautery.

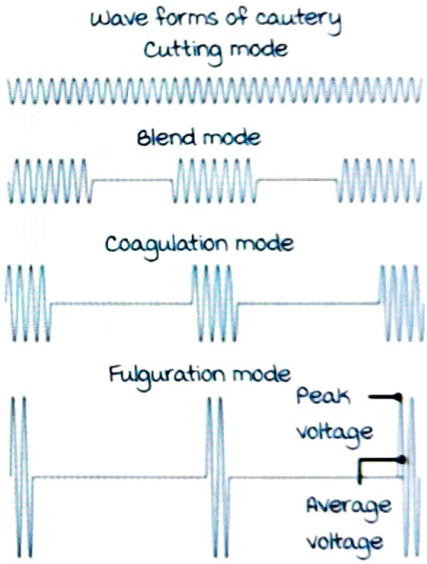
Active space

5. Lateral spread of current in monopolar cautery : This can cause thermal damage to vital nerves and vessels. Hence avoided in :

- Thyroid surgery (damage to recurrent laryngeal nerve, external laryngeal nerve).
- Axilla (damage to long thoracic nerve, thoracodorsal nerve).
- CNS surgeries.
- Parotid surgery.

Energy sources, cutting vs coagulation/ fulguration :

Cutting current : Low voltage continuous current.
Principle : Sufficient heat to cause cell water to explode into steam.



Coagulation : High voltage alternating current.
Principle : Cell death by dehydration and protein denaturation. Never applied to skin as it can burn the skin.

Fulgaration mode : Voltage higher than coagulation.
Blend mode : Both cutting & coagulation (combination mode).

Cautery sources are the most common cause of OT related fire.

Ligasure :

- Uses heat + pressure to carry out coagulation.
- Can coagulate vessels upto 7 mm in diameter.
- Uses body's collagen and elastin to seal and divide.
- Feedback mechanism : Energy delivery is in a precise manner and results in automatic discontinuation of energy once the vessel is completely sealed, then the vessel can be cut.

1st generation ligasure only coagulation
2nd generation ligasure : Coagulation followed by cutting.

Active space

Harmonic scalpel

00:31:10

- Works on the ultrasonic principle.
- Oscillatory blade that oscillates between 20000-50000 Hz oscillation that causes protein denaturation : Coagulation without heat production.

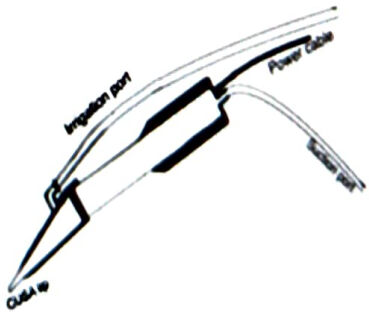
Advantage :

- Can be used close to vital structures.
- Precise cut.
- Can cut through scar tissue.
- Can coagulate vessels upto 7 mm in diameter.

Disadvantage : Takes longer time to coagulate and seal when compared to ligasure.

Thunderbeat S :

Has features of both ligasure and harmonic scalpel. The surgeon can switch between both the modes



CUSA : Cavitron Ultrasonic Surgical Aspirator used for liver resection.

Working principle : Hepatocytes are particularly susceptible to oscillatory fragmentation due to high water content and low collagen.
It can also aspirate the gas which is produced better in a non-cirrhotic liver.

Other energy sources

00:36:29

Radiofrequency ablation (RFA) :

- Principle : High frequency; Alternating current.
- Similar to electrocautery.
- Grounding pad needed.
- Till 3 cm tumors (HCC of liver).

Microwave :

- In between infrared & radiowaves.
- Principle : Oscillation & frictional heat.
- Larger, more homogenous zone of ablation.
- Less time than RFA.
- No grounding pad.

Microwave is now being preferred over RFA.

Argon :

APC : Argon Beam Photocoagulation.

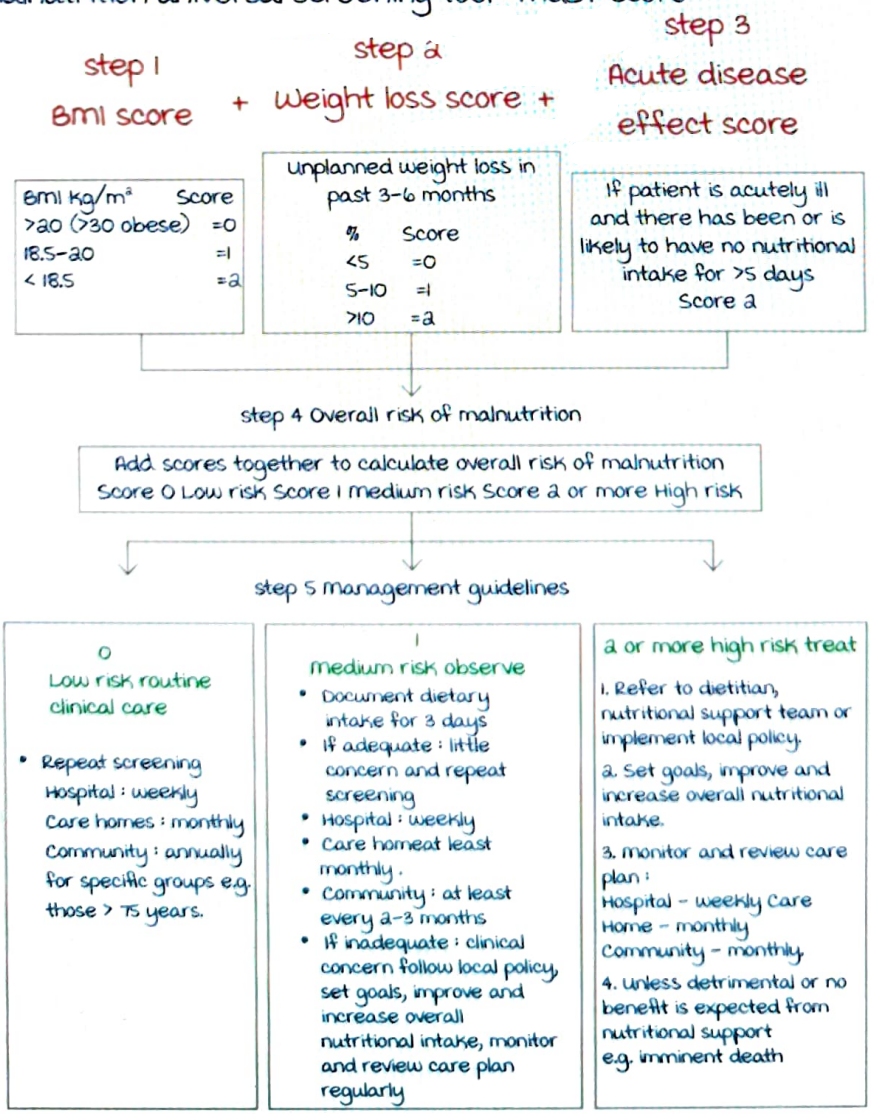
- Rapid activity.
- Shallow penetration : used in patients where there is
  1) UGI bleed.
  2) Barrett's esophagus.
  3) Gastric antral vascular ectasia (GAVE).
- Faster heat dissipation.
- Less eschar.
- Ineffective for larger vessels : Avoided close to central veins because it can give rise to embolism as Ar gas doesn't dissolve.

SURGICAL NUTRITION

Nutritional assessment (Biochemical, anthropometric assessment) :

- There is no single reliable biochemical marker which identifies malnutrition.
- Low albumin is an indicator of poor outcome. Serum prealbumin is a better marker.
- Unintentional weight loss of more than 10% in 6 months (Significant weight loss) is an indicator of poor prognosis.
- BMI <15 is associated with poor outcome.
- Skin fold thickness : body fat.
- Mid-arm circumference : muscle mass.

Malnutrition universal screening tool : MUST score :



Active space

All risk categories	Obesity
• Treat underlying condition and provide help and advice on food choices, eating and drinking when necessary. • Record malnutrition risk category. • Record need for special diets and follow local policy.	• Record presence of obesity. For those with underlying conditions, these are generally controlled before treatment of obesity.

Reassessment has to be done.

Nutritional requirement :

REE : Resting Energy Expenditure/Basal Energy Expenditure (BEE) :

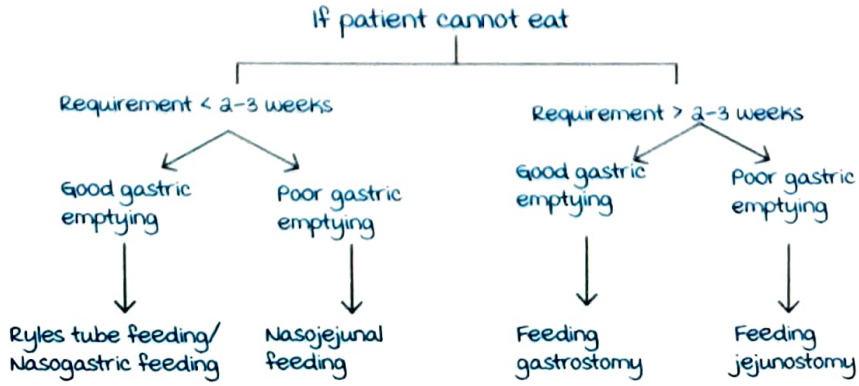
- In normal people = 1 (20Kcal/day)
- Mild to moderate sepsis = 1.4 times.
- Severe sepsis = 1.8 times.
- Severe burns = 2 times.

Enteral vs Parenteral nutrition :

- Enteral : Food through gut.
- Parenteral : Through i.v route.
- Enteral better than parenteral because
    1. It is physiological,
    2. Cheap,
    3. Maintain enterohepatic circulation,
    4. Maintains microvilli,
    5. Prevents translocation of gut bacteria.

Enteral Nutrition 00:08:46

Best route : through oral cavity.

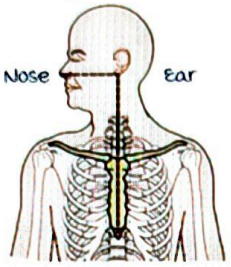


Ryles tube/Nasogastric tube (NG tube) :

- Best position to insert : Sitting with neck slightly flexed.
- When the Ryles tube is in right position,
    1. Gastric contents can be aspirated.
    2. Push air & auscultate in the epigastrium.

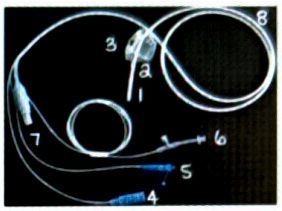
Ryles tube

NG tube length assessment

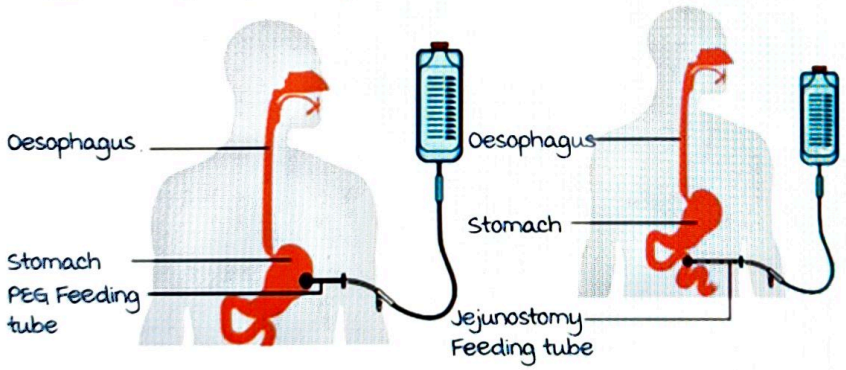


Place the tip of the nasogastric tube at the tip of the nose, then measure from the nose to the ear lobe and down to the tip of the xiphisternum

Nasojejunal tube/ Frecca tube



Feeding gastrostomy / Jejunostomy



Feeding gastrostomy :

- Physiological.
- Higher aspiration risk.
- Various ways for gastrostomy :
    1. Stam method.
    2. Witzel method.
    3. PEG (Percutaneous Endoscopic Gastrostomy) method.

Feeding jejunostomy :

- Various ways for jejunostomy :
    1. Stam method.
    2. Witzel method.

Stam method :

- There is more Peri-drain leakage.

Active space

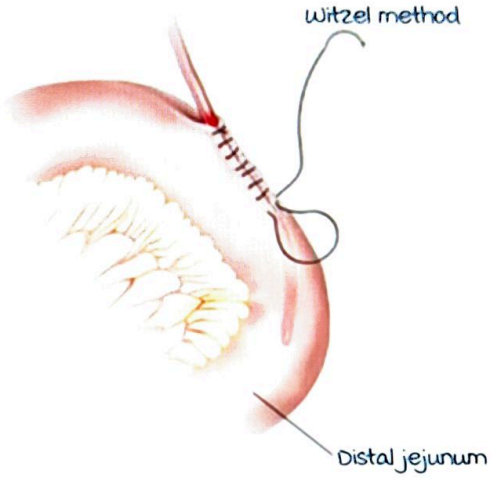
- Purse string suture is used to fix the tube.

Witzel method :

- Less leakage.

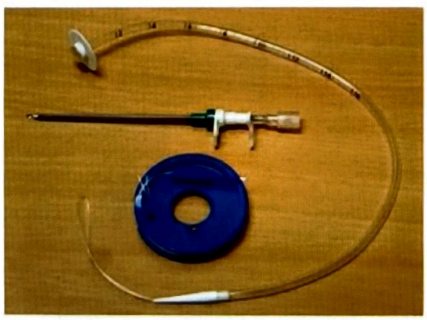
PEG method :

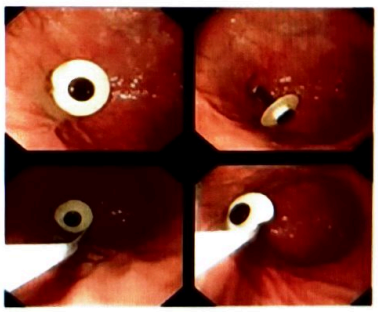
- 3 methods are there : Push, Pull, Introducer method.

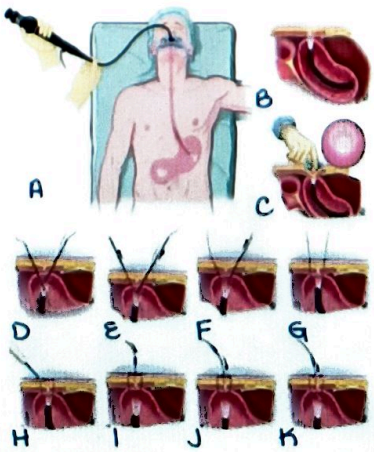


The open witzel technique. 3-0 silk seromuscular sutures are placed perpendicularly on the antimesenteric border of the bowel on the both sides of feeding tube (lembert sutures) in oder to imbricate the bowel wall over the feeding tube, creating a serious tunnel.

PEG Format







Active space

- Start gradually and then increase the volume.
- Start from 20-30 ml/hr and gradually build it up.
- Before next meal : Always aspirate first.
- If >200 cc of aspirate comes, withhold next feed.
- Break of 4-5 hours : During night time.
- After every tube feed, flush the tube with saline for patency of tube.

Complications of Enteral nutrition :

Tube related : (most common overall)

- Blocked,
- Displaced,
- Pulled out/Kinked.

Feeding regime related :

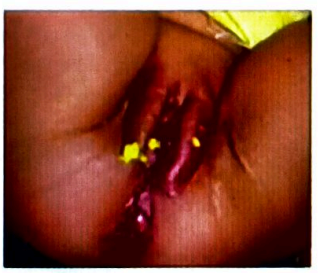
- most common feeding problem is osmotic diarrhoea. When sugar rich solution is given, it attracts more water in the bowel, there will be rapid transit leading to osmotic diarrhea.
- Overfeeding.

Parenteral nutrition :

Indications for Parenteral nutrition (contraindications for Enteral nutrition) :

- Prolonged ileus > 72 hrs.
- Short bowel syndrome :
    1. Net absorbers : >100cm of jejunum. They can absorb water & sodium.
    2. Net secretors : <100cm of jejunum. They cannot absorb water & sodium and are highly dependent on parenteral nutrition.
- High output faecal fistula (>500cc output in 24hrs).
- Acute episodes of IBD (Inflammatory Bowel Disease).
- Initial phase of acute severe pancreatitis.

Fecal fistula



Active space

Routes for parenteral nutrition :

- Best route : Central line.
- Least preferred : Peripheral i.v lines (Increased rate of thrombophlebitis).
  Short length, wide bore needle has to be used for TPN (Total Parenteral Nutrition).
- PICC line (Peripherally Inserted Central Catheter).

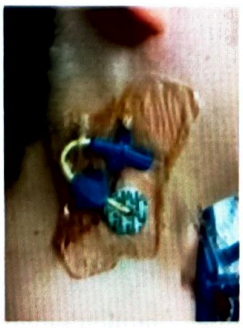
Central line

00:28:36

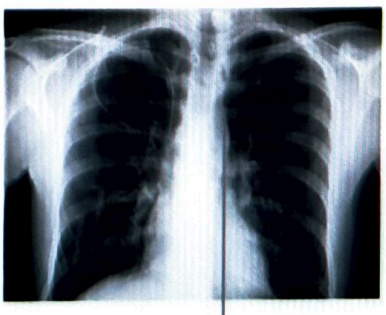
- most commonly used vein : IJV (internal jugular vein).
- most commonly used vein in TPN : Subclavian vein (SCV).
- SCV is preferred because it has least risk of infection.
- After central line, chest x-ray has to be taken.
- Central line tip : at the junction of SVC & right atrium.
- If it is deep into the atrium - ectopics on the ECG seen

	Subclavian line	IJV line	Femoral line
Ease of insertion	3	2	1
Risk of infection	3	2	1
Risk of pneumothorax	maximum (SCV is close associated with apex of lung)	2	-

Central line



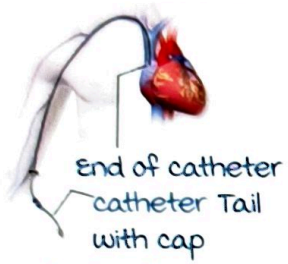
Central line tip X-Ray



Central line tip lies at the junction of SVC & right atrium.

PICC line :

- Used for nutrition, chemotherapy, prolonged antibiotic therapy.
- Kept in place for 3 to 4 weeks easily



PICC catheter


PICC Line

TPN (Total Parenteral Nutrition) :

- 2000 Kcal.
- 1L/ 2L solutions. white in colour.
- Contains fat, protein, carbohydrates (3 : 1) or fat, carbohydrates (2 : 1).
- Composition of TPN : 20 : 30 : 50 Ratio. (20% protein, 30% fat, 50% carbohydrates)
- In America, 60-70% carbohydrate, 10-20% protein, 10-20% fat.
- Based on carbohydrate content TPN can be high osmolar (High carbohydrate content), low osmolar (low carbohydrate content).


TPN Solution

- High osmolar :
  High carbohydrate → high carbon dioxide production → Respiratory Quotient >1.
  Increased risk of thrombosis.
  Therefore in a patient with respiratory failure(COPD), low osmolar TPN is preferred.
- In renal failure, low quantity TPN with high carbohydrate is used.

Active space

- For fever/infections.
- Daily weight measurement is done. > 1Kg/day is sign of Fluid overload (earliest sign).
- Weight gain after TPN usually starts from day 5-7.
- Monitoring :
    1. Daily weight.
    2. Vitals.
    3. Liver Function Test / Renal Function Test : once a week.
    4. Serum Electrolytes : Twice a week.

Complications of TPN :

Central line related	Feeding regime related
• Pneumothorax. • Arrhythmias. • Thrombosis. • Air embolism. • migration of central line. • Catheter related sepsis (most common Central line problem).	• Hyperglycemia (most common overall complication). • Excess weight gain (sign of fluid overload). • Cholestasis (If there is increase in serum bilirubin, withhold TPN until it becomes normal). • micronutrient deficiency (most commonly : zinc). • Hyper/Hypokalemia, natremia, calcemia phosphatemia. • Refeeding syndrome.

Catheter related sepsis :

- Endoluminal brush to take culture sample.
- Remove the line and send a tip for culture.

Active space

Refeeding syndrome :

- Develops when large quantities of TPN are given in a chronically malnourished patient.
- Malnourished : catabolic state. On giving large quantities of TPN : Shifts to anabolic state.
- metabolic abnormalities :

  Hypocalcemia

  Hypophosphatemia

  Hypomagnesemia + Fluid overload → Arrhythmias, CHF

  Hypokalemia

  Hyponatremia
- Refeeding syndrome can be prevented by
  1. Gradually increase the quantity of feeds.
  2. Thiamine supplementations.
  3. Strict monitoring of serum electrolytes.

Post-operative fluid requirement 00:51:38

1. Daily electrolyte requirements :
   - maintenance fluid requirements are calculated approximately from an estimation of insensible and obligatory losses.
   - Various formula are available for calculating fluid replacement based on the patient's weight or surface area.
   - For example, 30-40ml/kg gives an estimate of daily requirements. The following are the approximate daily requirements.

     Sodium : 50-90 mm/day;

     Potassium : 50 mm/day;

     Calcium : 5 mm/day;

     Magnesium : 1 mm/day.

2. Goal directed therapy :

Insensible losses : 30-40 ml/kg

+

If Ryle'stube → replace with NS + KCl.

+

Active space

If Drains → RL/ Hartmann's solution.

+

If Urine output → NS/DNS.

3. Potassium replacement not done on the day of surgery. It can be started from day one.

Composition of crystalloid and colloid solutions :

Composition of crystalloid and colloid solutions (mmol/L)						
Solution	Na	K	Ca	Cl	Lactate	Colloid
Hartmann's	131	5	2	111	29	
Normal Saline(0.9% NaCl)	154			154		
Dextrose Saline(4% dextrose in 0.18% Saline)	30	30				
Gelofusine	150	150				Gelatinn4%
Haemacel	145	5.1	<1	145		Polygelin 75 g/L
Hetastarch						Hydroxyethyl starch

Gelofusine, Haemacel, Hetastarch are colloids (For volume expansion).

Special Situations :

1. Head injury : avoid dextrose (i.v. mannitol is used to reduce intracranial tension).
2. In renal failure : Restrict potassium.

Composition of gastrointestinal secretions (mmol/L)				
	Na	K	Cl	HCO_3
Saliva	10	25	10	30
Stomach	50	15	110	-
Dudoenum	140	5	100	-
Ileum	140	5	100	30
Pancreas	140	5	75	115
Bile	140	5	100	35

Active space

Q. The earliest sign of post-op overload is ?

A. Distended neck veins.
B. Weight gain.
C. Peripheral edema.
D. Increased cardiac output.

Q. Is the MC complication of supplementary nutrition (enteral or parenteral)

A. Sepsis.
B. Overfeeding.
C. Nutritional deficiencies.
D. Tube related complications.

Q. Which of the following is not true regarding MUST (Malnutrition Universal Screening Tool) ?

A. It is useful only for adults.
B. It takes into account BMI, weight losss score & acute disease effect score.
C. It has 5 steps.
D. It is a one time measurement.

Q. A PICC line is inserted in a patient for prolonged antibiotics. While inserting the PICC line the resident wants to know the ideal position of the tip of the PICC line.

A. Subclavian vein.
B. Internal jugular vein.
C. Superior vena cava.
D. Inferiror vena cava.

Q. Which of the following is not true regarding entral lines for nutrition?

A. TPN is best delivered through a central line.
B. Subclavian central lines have a higher rate of pneumothorax as compared to IJV central lines.
C. Subclavian central lines are technically easier to insert as compared to IJV central lines.
D. Hickman lines through subclavian route are associated with less risk of displacement and wound infection.
E. Femoral lines have the highest infection rate.

Active space

Q. Which dietary component is lacking in patients started in patients started on TPN?

A. Lipids.
B. Carbohydrates.
C. Fibres.
D. Proteins.

Q. Which one of the following statements is not true regarding re-feeding syndrome ?

A. It is associated with hypokalemia, hypophosphatemia, hypomagnesemia, hypocalcemia.
B. Thiamine supplementation reduces the incidence of re-feeding syndrome.
C. Strict monitoring of electrolytes should be done once TPN has been started.
D. Cerebral edema and strokes are the leading cause of death in this condition.

Q. Following TPN, one expects weight gain after how much time ?

A. 1-2 days.
B. 5-7 days.
C. 12-14 days.
D. 20-22 days.

Q. Highest amount of potassium in present in which secretions?

A. Saliva
B. Pancreas
C. Stomach
D. Bile

Q. In the ICU, one patient has been receiving TPN since 5 weeks. Which one of the following is a false statement ?

A. Sudden glucose intolerance is and early sign of sepsis
B. Central line should be changed every weeks to prevent infections.
C. Electrolytes should be checked every 2-3 days.
D. LFT and BUN should be atleast once weekly.

Active space

Q. A patient is receiving TPN. Calculate the calories if the patient recieves 100gm of dextrose, 30gm of amino acids and 40 gm of lipids.

A. 840

B. 880

C. 640

D. 680

Dextrose : 4 Kcal/gm : 4 X 100 = 400

Amino acid : 4 Kcal/gm : 4 X 30 = 120

Fatty acids : 9 Kcal/gm : 4 X 90 = 360

Total : 880 Kcal/gm

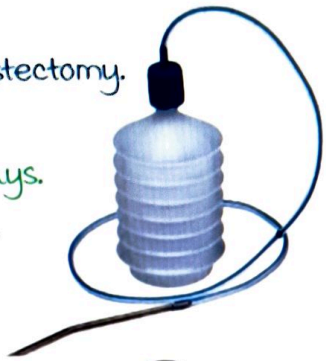
SUTURES, KNOTS AND SURGICAL DRAINS

Drains

00:00:36

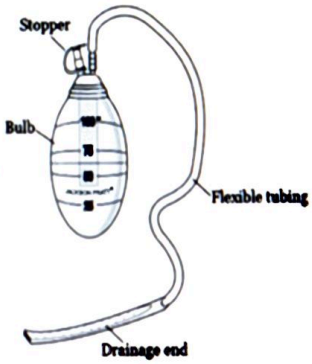
Romovac suction drain :

- Used after modified radical mastectomy. drain is removed when output is <40cc/day for 2 consecutive days.
- Also used after thyroid surgery.



Minivac suction drain :

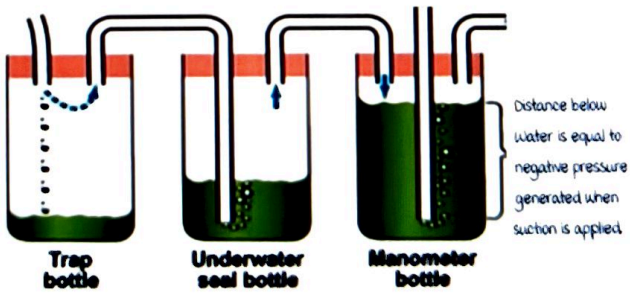
- Miniature version of Romovac suction drain.
- Used after sentinel LN biopsy and, also after LN biopsy. Fixed to skin with silk/ nylon.



Jackson-Pratt drain :

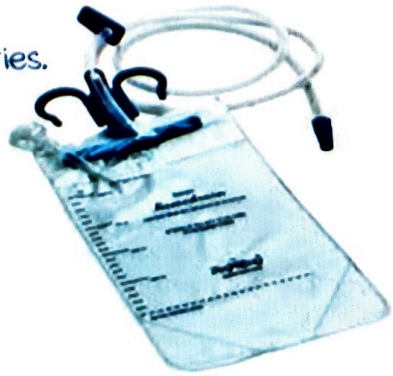
- Used after abdominal surgeries Has flat tubing.

Chest tube drainage system – it is also known as underwater seal system.



Abdominal drain :

- Used after abdominal surgeries.
- Its put in the pelvis.
- There is no negative suction.



Active space