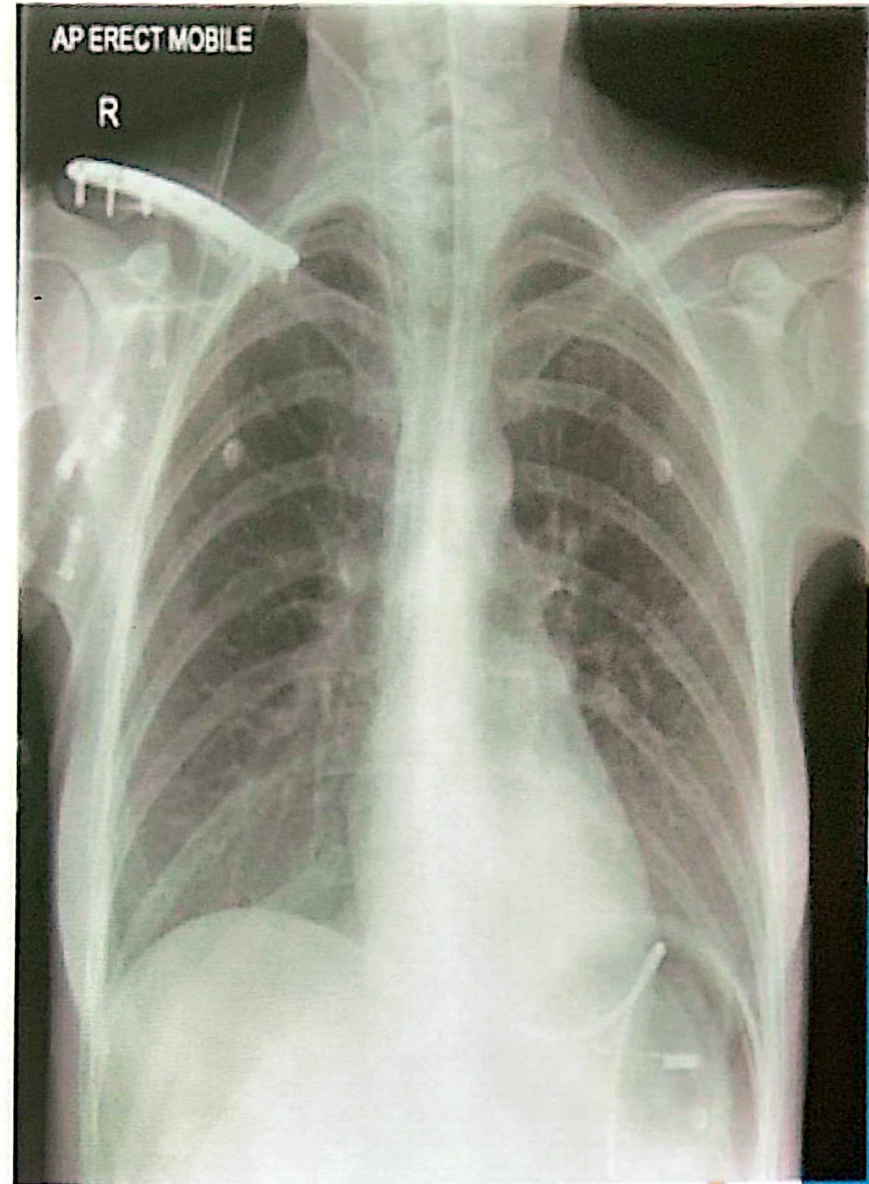


Parental Nutrition

Dr.Fatema Tasnim
Assistant Professor
Department of Surgery

- Nutrition may need to be delivered intravenously in patients in whom adequate feeding through the alimentary tract is not possible. This can be either-
 - in addition to enteral feeding (supplemental parental nutrition)
 - the sole source of nutrition Total parental nutrition (TPN)
- All nutritional requirements are given only through intravenous route, not through gastro-intestinal tract.
- It can be through a central catheter through subclavian/internal jugular vein where the tip of venous catheter is at distal part of Superior vena cava.
- It can be through peripherally inserted central venous catheter (peripheral parental nutrition/PPN)



- Parental nutrition is usually administered directly into the central venous system to minimise the risk of venous thrombophlebitis.
- Femoral lines should be avoided for parental nutrition because of high risk of infection at this site.
- Chest radiographs should be performed after PICC or Central venous catheter are inserted to confirm the correct position of the line tip within the SVC or right atrium prior to commencing the parental feed.
- PICC lines may be inserted through the basilic (most common), cephalic, brachial, median cubital vein of the arm & can be used for parental nutrition administration over several weeks to months.

Complications of parental feeding

- **Insertion complications**

1. Pneumothorax
2. Misplacement

- **Line complications**

1. Sepsis
2. Thrombosis

- **Metabolic complications**

1. Electrolyte disorder/Refeeding syndrome
2. Blood sugar derangement
3. Liver dysfunction
4. Metabolic bone disease
5. Vitamin deficiencies

Refeeding syndrome

- Occurance of severe fluid and electrolyte imbalance in severely malnourished individual.
- This occurs in the first days after feeding is commenced.
- It is more common in TPN.
- Patients due to start nutritional support need to be screened for the risk of refeeding syndrome.
- The degree of risk is related to their BMI, amount & rate of unintentional weight loss, period of starvation & electrolyte levels.

Patient is considered to be at risk of developing refeeding syndrome with either

- **One or more of the following-**

- BMI < 16 kg/m²
- Unintentional weight loss > 15% within last 3-6 months.
- Little or no nutritional intake for more than 10 days.
- Low potassium, phosphate, magnesium levels prior to feeding

- **Two or more of the following -**

- BMI < 18.5 kg/m²
- Unintentional weight loss > 10% within last 3-6 months.
- Little or no nutritional intake for more than 5 days.
- History of alcohol abuse or on medication including insulin, chemotherapy, antacids or diuretics.

- The main underlying pathological process is **hypophosphataemia**, resulting in fluid and electrolyte imbalance between extracellular & intracellular compartments.
- Patients may develop -
 - arrhythmias
 - muscle weakness
 - respiratory or cardiac failure
 - edema
 - lethargy
 - seizures.

- Laboratory test reveals low level of phosphate,potassium,magnesium and lactic acidosis.
- Nutiriton support should be started at a maximum of 10kcal/kg per day,aiming to increase levels slowly to meet full needs by 4-7 days.
- Frequent monitoring and replacement of electrolytes listed above is essential.
- Nutritional support should include thiamine,vit B.multivitamins and trace elements.

Recommended schedule for monitoring feeding regimens

- Daily

Observation	Plasma
Pulse,Blood pressure,Temp	Sodium,Potassium,Urea,Creatinine
Body weight	Blood glucose
Fluid balance including volume of urine	Magnesium,Phosphate
Quantity or type of food consumed	Liver function test,CRP

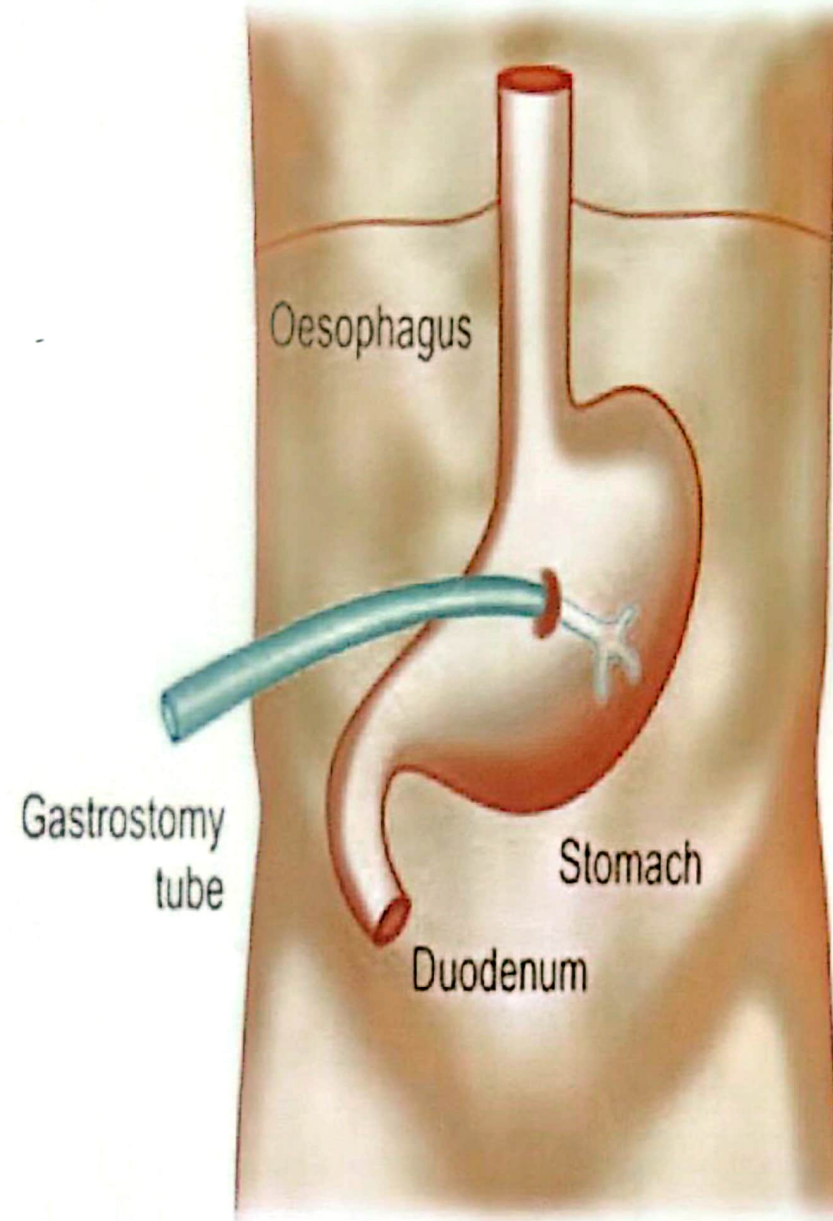
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Weekly to Fortnightly

- Plasma levels-
- Complete Blood count (CBC)
- Calcium,Zinc,Copper
- Albumin
- Thiamine
- Vit B12
- Triglyceride
- Folic Acid



Complications of enteral feeding

- **Tube Related-**

1. Malposition
2. Displacement
3. Blockage
4. Breakage/leakage
5. Local complications (Erosion of skin /mucosa)

- **Gastrointestinal**

1. Diarrhoea
2. Bloating, Nausea, Vomiting
3. Abdominal Cramp
4. Aspiration

- **Metabolic**

1. Electrolyte imbalance including refeeding syndrome
2. Vitamin mineral and trace element deficiency
3. Drug interactions