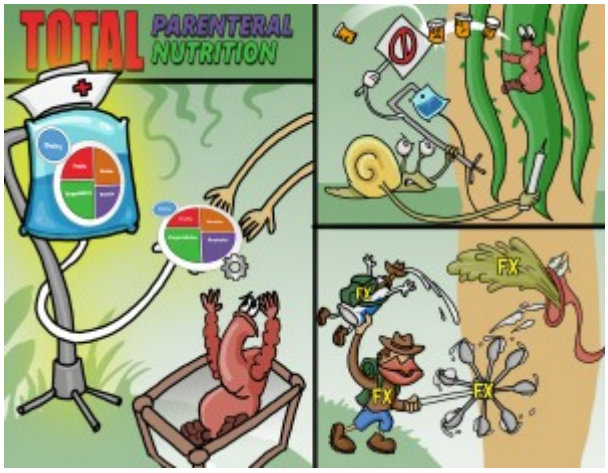
Total Parenteral Nutrition (TPN)

When enteral feeding is contraindicated in patients, nutrition can be provided intravenously. This method is called total parenteral nutrition (TPN) or parenteral nutrition (PN). TPN solutions usually contain fat emulsions (lipids), dextrose, amino acids, vitamins, and minerals; these components can be customized to meet the individual nutritional needs of each patient. Each TPN preparation should be administered slowly, using an infusion pump, through a large, central vein. Side effects may include nausea and vomiting, hyperglycemia, hyperlipidemia, and refeeding syndrome. Remember, no added medications should be given through the designated TPN line.



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Mechanism

Nutrition Given Outside GI

Nutritional-plate Outside of GI-guy

Patients who are unable to tolerate enteral feedings can be given an intravenous solution containing fat emulsions, dextrose, amino acids, vitamins, and minerals. This solution can be modified to meet the individual nutritional needs of each patient.

Side Effects

Hyperglycemia

Hiker-glue-bottle

Blood glucose levels should be monitored closely in patients receiving TPN. Solutions containing too much dextrose may lead to hyperglycemia. Anticipate that sliding insulin may be ordered to keep blood glucose level within normal range.

Hyperlipidemia

Hiker-lips

The amount of lipids in a TPN solution should be determined based on a patient’s metabolic needs, in order to prevent hyperlipidemia. Keep in mind, administration of fat emulsions or lipids is contraindicated in patients with preexisting hyperlipidemia. Lipid-free TPN may be administered the first 3-5 days in critical patients to avoid onset of proinflammatory conditions, which can occur with omega-6 fatty acids.

Refeeding Syndrome

Refeeding-refeeder

Refeeding syndrome can occur in chronically malnourished patients who are started on nutritional therapy. When nutritional support is delivered too quickly, there is a sudden increase in phosphate demand, causing phosphate to be drawn out of the blood. Hypophosphatemia can cause dysrhythmias, respiratory depression, and changes in mental status. Fluid retention is also characteristic of refeeding syndrome, along with other electrolytes imbalances (hypokalemia, hypomagnesemia).

Nausea and Vomiting

Vomit

When administered too rapidly, TPN solutions containing lipids may cause nausea, vomiting, and in some cases elevated temperature. An infusion pump must be used to ensure that the solution infuses slowly, at a constant rate.

Considerations

Slow IV Infusion

Snail IV

When administered too rapidly, TPN solutions containing lipids may cause nausea and vomiting. Hyperosmolar diuresis can also result from an infusion that is too rapid, and can lead to dehydration, hypovolemic shock, seizures, coma, and death. Do not increase rate of TPN in an attempt to catch up, if the infusion falls behind schedule.

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Use Large Central Vein

Using Large Center Vine

TPN should be administered through a large central vein to prevent complications such as thrombophlebitis. This condition occurs when there is irritation of the vein caused by a clot. An infusion pump must also be used when administering TPN, to ensure that the solution infuses slowly, at a constant rate. Keep in mind that central line parenteral nutrition and peripheral parenteral nutrition (peripheral large venous access) will differ in tonicity, because peripheral veins cannot tolerate the hypertonicity of central line TPN solutions due to problems associated with irritation and thrombophlebitis and fluid overload.

No Added Meds to TPN Line

No-sign Med-bottles in Line

It is important to remember that additional medications should not be added to the TPN solution, nor should they be administered through the line containing TPN. An IV filter should be used with all TPN infusions.

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