Guidelines for Parenteral Nutrition Support

Criteria:

Nonfunctioning gastrointestinal tract

- Cannot be used safely and effectively
- Use is undesirable of contraindication for prolonged period
- Unable to tolerate adequate nutrition orally

Guidelines:

1. Normally nourished patients unable to eat for 7-10 days generally **DO NOT** require pn.
2. Pn should be promptly initiated as soon as it is determined that enteral starvation will persist for 7-10 days or more, even if normally nourished.
3. Moderately malnourished patients who require intensive medical or major surgical intervention should be started on pn immediately.
4. Markedly hypercatabolic patients (burns, sepsis, trauma) should be started on pn immediately, even if well nourished.
5. Severely malnourished patients should begin pn immediately
6. Acute metabolic derangements should be corrected before pn is initiated (should be hemodynamically stable).
7. Examples of situations in which pn may be useful:
   - acute pancreatitis
   - enterocutaneous fistulas
   - intractable vomiting, diarrhea
   - hyperemesis gravidarum
   - intensive cancer chemotherapy, radiation therapy
   - inflammatory bowel disease
   - short-bowel syndrome

Contraindications:

1. Patients who have a functional and usable gastrointestinal tract capable of absorption of adequate nutrients.
2. The anticipated need for pn is less than 5 days.
3. When aggressive nutrition support is not desired by the patient or legal guardian, in accordance with hospital policy and existing law.
4. Prognosis does not warrant aggressive nutrition support – should not be used when malnutrition is due to rapidly progressive disease not amenable to curative or palliative therapy (not to sustain the hopelessly ill; may only prolong suffering).
5. Pn should not be used during periods of acute hemodynamic instability.
6. Pn should not be used during surgical operations, unless it is a short procedure under local anaesthesia.
7. When the risks of pn are judged to exceed the potential benefit.

Total Parenteral Nutrition Solutions:

- Contains admixtures of carbohydrates, fats, protein, electrolytes, minerals, vitamins, trace elements, and water
- Can provide all the necessary nutrients to meet requirements for growth, weight gain, anabolism, and wound healing.
- Proportion of each component is individualized based on the patient's clinical status, chronic diseases, fluid and electrolyte balance and specific goals of pn.

Carbohydrates:

- Glucose is the primary energy source in most pn solutions. The final solution concentration should be no more than 10% to 12% for peripheral infusion and no more than 35% for central venous infusion.

Lipids:

- Intravenous lipid emulsions are given to prevent essential fatty acid deficiency and as a concentrated source of energy. Lipids are better tolerated and used if they are infused slowly, not to exceed the manufacturers recommendations of no greater than 62 ml/h up to a maximum of 12 hours for each bottle.

Protein:

- The protein or nitrogen source is provided by synthetic crystalline amino acid solutions. These solutions contain a mixture essential and nonessential amino acids.

Electrolytes:

- Electrolytes are added to TPN solutions to meet individual patient requirements and to correct any deficiencies cause by loss, utilization, or requirements, or decreased absorption. They include sodium, potassium, chloride, calcium, magnesium, and phosphorus acetate. The requirements of individual patients may vary depending on their nutritional status and underlying disease process.

Vitamins:

- Vitamins are organic compounds essential for maintenance and growth that are not synthesized by the body. These are two main groups: fat soluble (A,D,E,K) and water soluble (B complex, C).

Trace Elements:

- Trace elements are required in very small amounts and are referred to as micronutrients. Those commonly added to TPN solutions are zinc, copper, chromium. manganese, and selenium.

Parenteral Nutrition Administration:

- Solutions for pn are normally kept refrigerated until they are used.
- The recommended hang time for pn solutions is 24 hours, and 12 hours for lipid solutions.
- Pn solutions should be inspected for any signs of precipitate or instability before hanging.
- The label should also be checked against the pn orders to ensure accuracy. (Some units require checking it every shift). The volume and infusion rate are usually noted on the label by the pharmacy.
- Parenteral nutrition should be infused at a constant rate, as ordered. Variable infusion rates can result in wide fluctuations in blood sugar levels.
- If pn solutions are interrupted or unavailable, standing orders should be available to infuse 5% dextrose solutions at the same rate, either through the central line or peripherally if the central line is removed or lost. This will prevent sudden hypoglycemia.
- The IV tubing and filters should be changed every 24 hours for pn and 12 hours for lipids. Leur Lock connections are optimal to avoid accidental disconnections.
- Abrupt cessation of pn should be avoided. It is generally safe to taper the infusion over several hours before stopping.

Home Parenteral Nutrition:

- This has resulted in shortening hospital stays, reduced costs, and improved patient well-being, both psychologically and physically, by being in the home environment.
- Nurses have the primary role in preparing the patient for hpn. the education process should include verbal instructions, with demonstration of all procedures. Return demonstrations by the patient or primary caregiver is essential to assess competency. A manual of written instructions should be provided to all patients.
- Verbal and written instructions should include:
    1. all appropriate procedures related to the administration of pn and care and maintenance of central venous access devices.
    2. use, maintenance, and trouble-shooting of the infusion pump.
    3. storage, management, and disposal of solutions and supplies.
    4. self-monitoring guidelines and potential complications.
    5. Problem-solving techniques.
    6. emergency interventions.
    7. expectations of home care and medical and nursing follow-up.