

Parenteral Nutrition

Nutrition is essential to health and can be provided via the bloodstream if necessary.

Nutrition

Good nutrition is essential to growth, healing, and vitality. The body requires specific amounts of carbohydrates, protein, fat, vitamins, and minerals depending on body weight and other considerations. For a variety of reasons, in some people, gastrointestinal function is not adequate to obtain necessary nutrients and fluid from food alone. In these circumstances, nutrition can be provided directly into the veins (**parenteral nutrition**, distinguished from **enteral nutrition**, which is provided through the gut). Adequate hydration must be provided, but many patients can be without nutrition for up to 7 days. However, depending on the circumstances, nutrition might need to be started sooner.

Short-term Nutrition

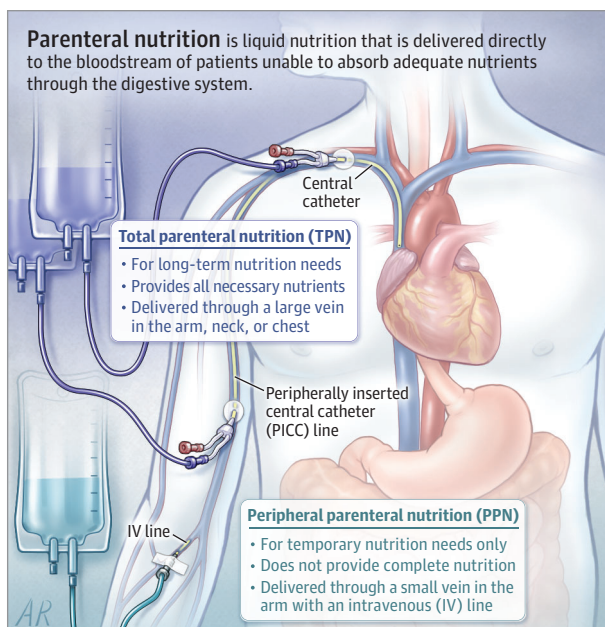
If a patient is expected to need nutrition for a short time, **peripheral parenteral nutrition (PPN)** can be provided for a few days. This type of nutrition is fat-based and does not contain full carbohydrates, so it provides only part of the nutrients that a patient needs in a given day and should be used only as a temporary solution. The main advantage to this type of nutrition is that it can be given through an intravenous (IV) line. Peripheral parenteral nutrition can be given continuously throughout the day and night or it can be **cyclic** (given over a few hours a day). Patients cannot receive PPN at home.

Long-term Nutrition

If patients are unable to tolerate enteral nutrition for longer than a few days, **total parenteral nutrition (TPN)** can provide all the types of nutrients that a patient needs. Although TPN provides complete nutritional support, it contains a large amount of carbohydrates, which can damage small veins. Therefore, it cannot be given through an IV line and instead needs to be given through a line placed into the large veins near the heart. These lines include a **peripherally inserted central catheter (PICC)** line, which is usually inserted in the arm; a temporary **central line**, inserted in the neck or chest; or a long-term tunneled catheter or implanted port, inserted in the chest. Like PPN, TPN can be given continuously or can be cyclic. An advantage of TPN is that patients can continue to receive it at home; however, there is a risk of serious infection associated with central lines.

Complications

Parenteral nutrition can have serious complications. Bloodstream infections from the lines through which the nutrition is given can be



serious and require interruption of the nutrition, antibiotics, and exchange of lines. In some patients, parenteral nutrition may cause mild to severe liver dysfunction, including liver failure. Parenteral nutrition is broken down into basic elements like electrolytes and amino acids, and these components are delivered consistently over a given 24 hours without ability to adjust from hour to hour. In contrast, nutrition that is absorbed through the gut is used by the body depending on its needs. It can take several days to adjust parenteral nutrition to a patient's specific needs. Requirements can change from day to day, and severe electrolyte disturbances can occur. Patients need frequent blood tests to make sure that their nutrition is safe. In the hospital, TPN must be specially prepared each day. Once an appropriate recipe is achieved, a patient can go home, and adjustments can be made as needed on a weekly basis.

FOR MORE INFORMATION

Mayo Clinic

www.mayoclinic.org/tests-procedures/total-parenteral-nutrition/about/pac-20385081

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