Administration of Pediatric PN

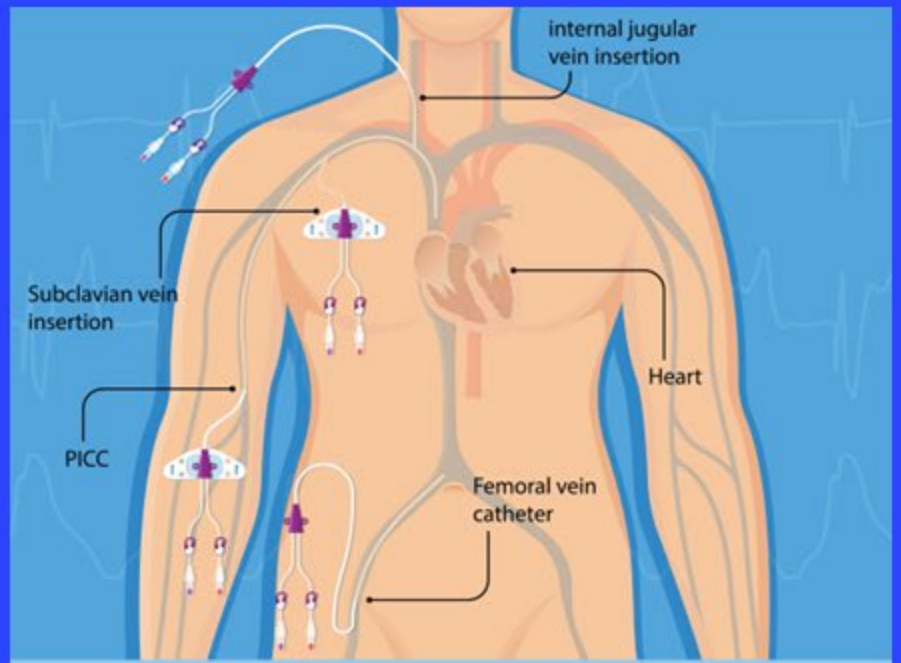
Venous Access

Central Access

- Tip is positioned in a central vein
  - Superior vena cava (SVC)
  - Inferior vena cava (IVC)
  - Right atrium (RA)
    - Risk of cardiac perforation/arrhythmia (particularly small neonates)

Peripheral Access

- Tip is not positioned in the SVC, IVC, or RA



Central Venous Catheter

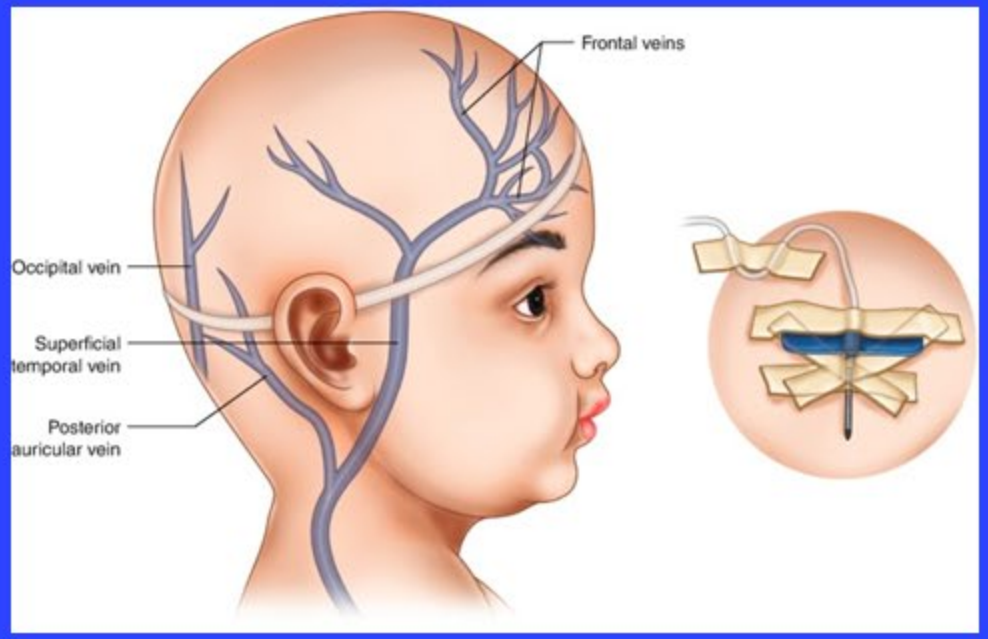
Vein Institute of New Jersey. Last Accessed: July, 2024

Wendel DJ, *et al. J Pediatr Gastroenterol Nutr.* 2021;7(3):474-86.

Venous Access: Alternative Sites

Scalp veins (neonates)

- Alternative site of venous access
- Often visible and easily accessible
  (lack of hair, thin skin)
- Not preferred for long-term access



Noble JR. Emergent Vascular Access

Venous Access Considerations

Peripheral Access

- Used for <2 weeks
- Nutrient needs can be met by peripheral PN
- No fluid restriction
- Osmolality <900 mOsm/L
  - Maximum 10 - 12.5% dextrose

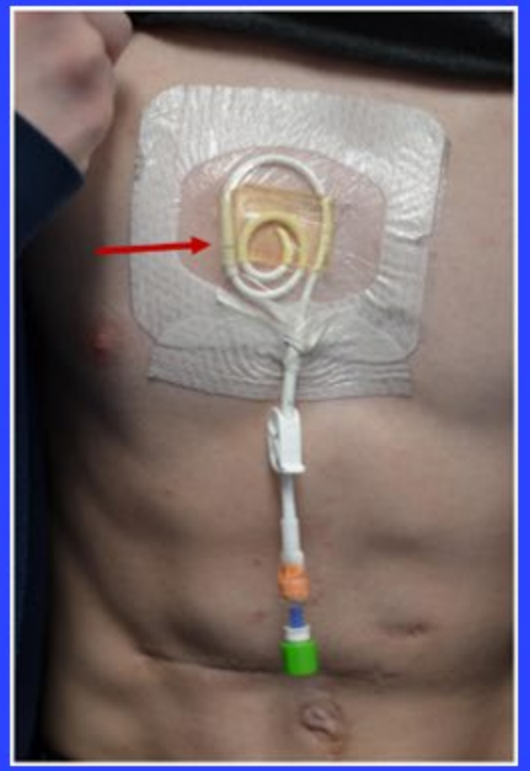
Central Access

- Used for >2 weeks
- Nutrient needs cannot be met by peripheral PN
- Peripheral access limited
- Patient is fluid restricted
- Need for hypertonic solutions

Boullata JI, *et al. J Parenter Enteral Nutr.* 2014;38(3):334-77.

Venous Access Additional Considerations

- The more lumens, the higher the chances of infection
- Impregnated, or locked catheters can be useful to prevent infection, thromboses
  - May contain antibiotics, antiseptics, antithrombolytics, antifibrinolytics
  - May cause allergic response, potentially higher rates of catheter breakage
- Line must be secured, and meticulous sterile technique used with access

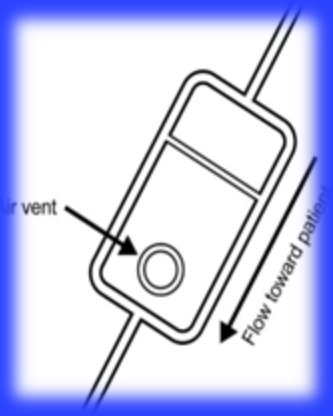


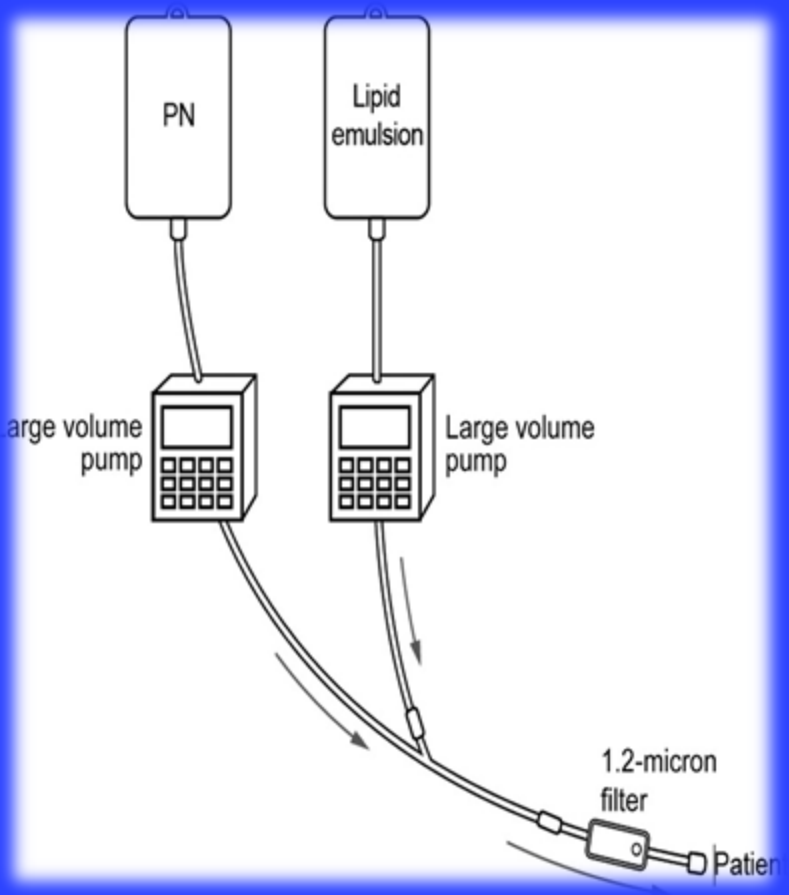
Wendel. JPGN 2021

Sierra CM, *et al. Pediatr Pharmacol Ther.* 2023;28(2):136-42.

Venous Access: Alternative Sites

- Filters are placed between the PN solution and patient to remove hazardous particulate matter (e.g., pathogens)
- Traditionally two filter sizes available (0.22 microns + 1.2 microns)





0.22 micron filters	1.2 micron filters
• Removes most pathogenic bacteria • Only compatible with 2-in-1 solutions	• Removes *Candida* + large lipid droplets • May be used with 3-in-1 solutions

Worthington P, *et al. Nutr Clin Pract.* 2021;36(1):29-39.