WORKSHOP ON PARENTERAL NUTRITION

FACILITATORS:

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OBJECTIVES

- **Introduction to the basics**
- **Indications and contraindications**
- **Decision making algorithm**
- **Routes**
- **Nutrient recommendations**
- **Calculations and hands on practice**
- **Complications and PN in special disease states**

What is parenteral nutrition?

Infusion of nutrients through an intravenous line.

Nutrients?

- **Dextrose**
- **Amino acids**
- **Lipid**
- **Vitamins**
- **Minerals**
- **Electrolytes**
- **Trace elements**

Who is responsible?

- **Physician**
- **Clinical Dietitian**
- **Pharmacist**
- **Nurse Manager**

PN addresses factors that lead to malnutrition

- **Impaired absorption or loss of nutrients**
- **Mechanical bowel obstruction**
- **Need to restrict oral or enteral intake: bowel rest**
- **Motility disorders**
- **Inability to achieve or maintain enteral access**

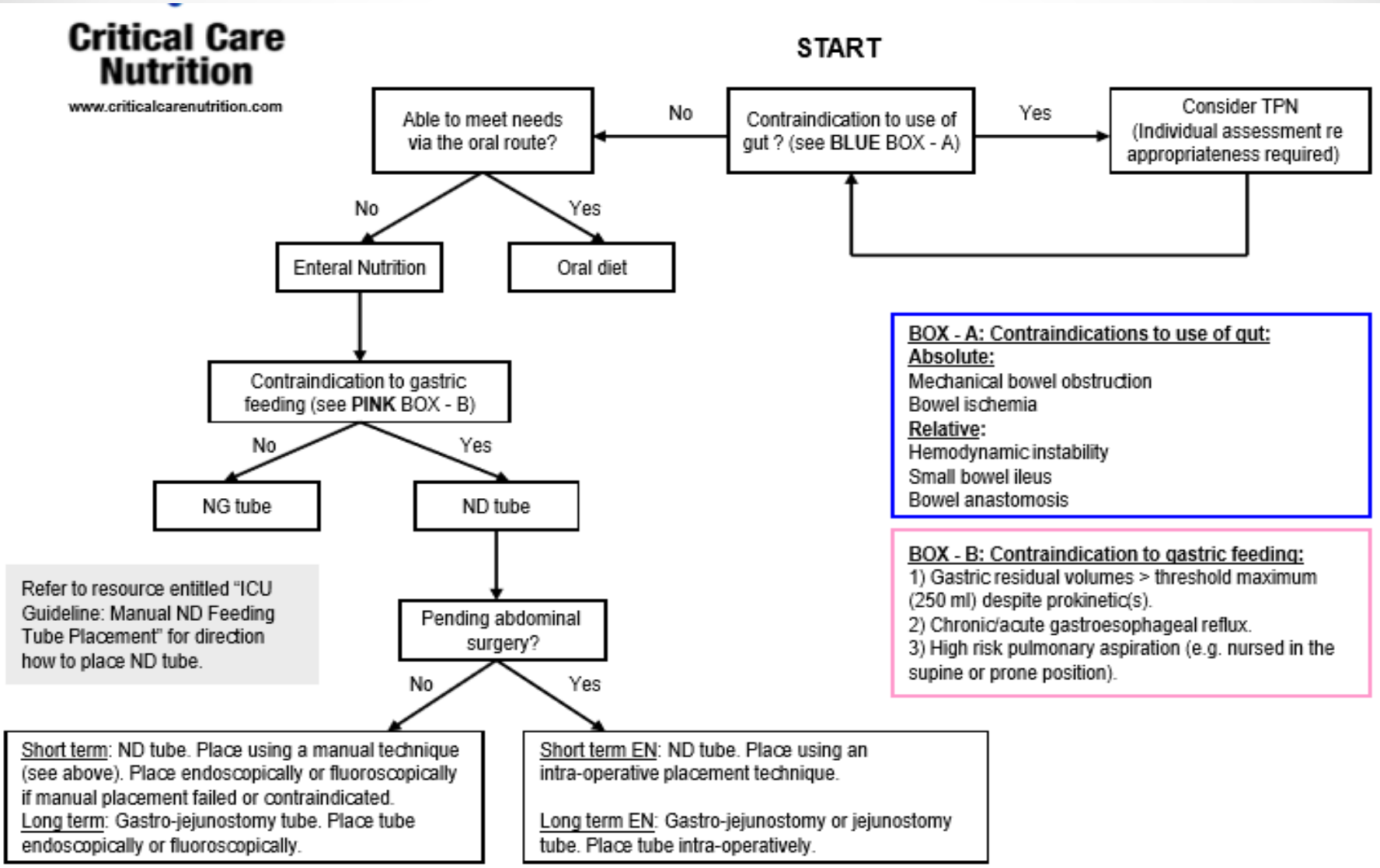
PN can be used in a variety of settings

- **Acute care**
- **Chronic care**
- **Home PN**

Indications & Contraindications

Indication	Contraindication
Severely malnourished patient in whom enteral feeding is not possible, or have non functioning gut or are not meeting nutrient target via enteral intake alone.	Well-nourished individuals who cannot maintain enteral intake for the first week.
Severe diarrhea or vomiting	Severe fluid or electrolyte disturbance
Massive bowel resection	Hyperosmolality
Diffuse peritonitis	Encephalopathy
Gut ischemia	Patients with functional gut
Enterocutaneous fistula with high output	
Intestinal obstruction with failure for nutrient delivery for 7 days	Patients meeting 60% of nutrient needs enterally
Patients unable to meet 60% of their nutrient needs enterally or orally in one week	

PN Decision Making Algorithm



Developed by: J. Greenwood, RD. Critical Care Program – Vancouver Coastal Health Authority (Update 7/4/2010). Used with permission.

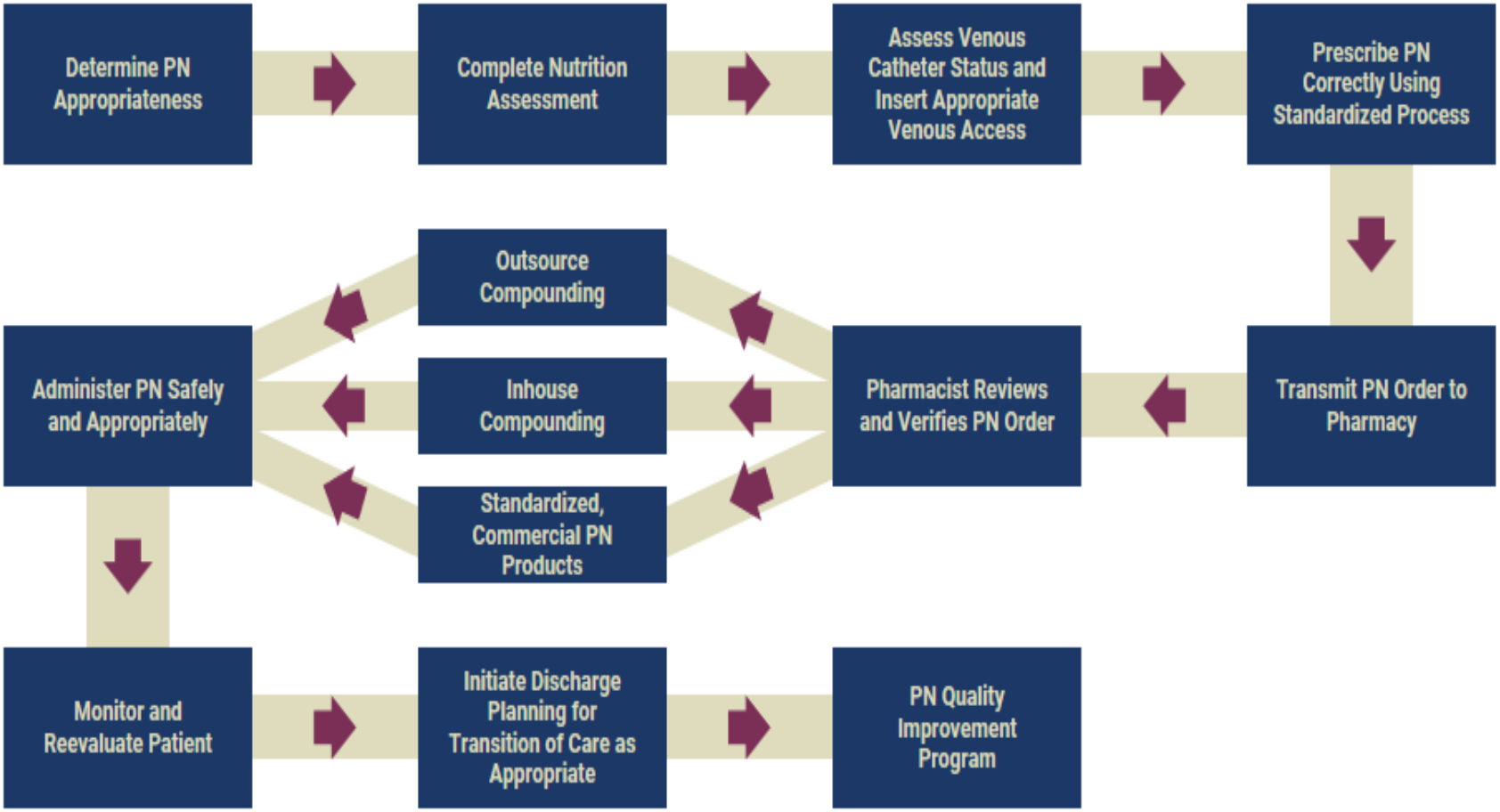
ASPEN Parenteral Nutrition Care Pathway

This patient care pathway provides steps and online resources – from initial assessment of need to transition to home – for patients who may require parenteral nutrition (PN). Click on resources to pull up documents, checklists, and websites. Please note that, though the majority of these materials are open-source, some require a subscription in order to obtain access to full journal articles.

This pathway was developed by the ASPEN PN Safety Committee.

Overview of Pathway

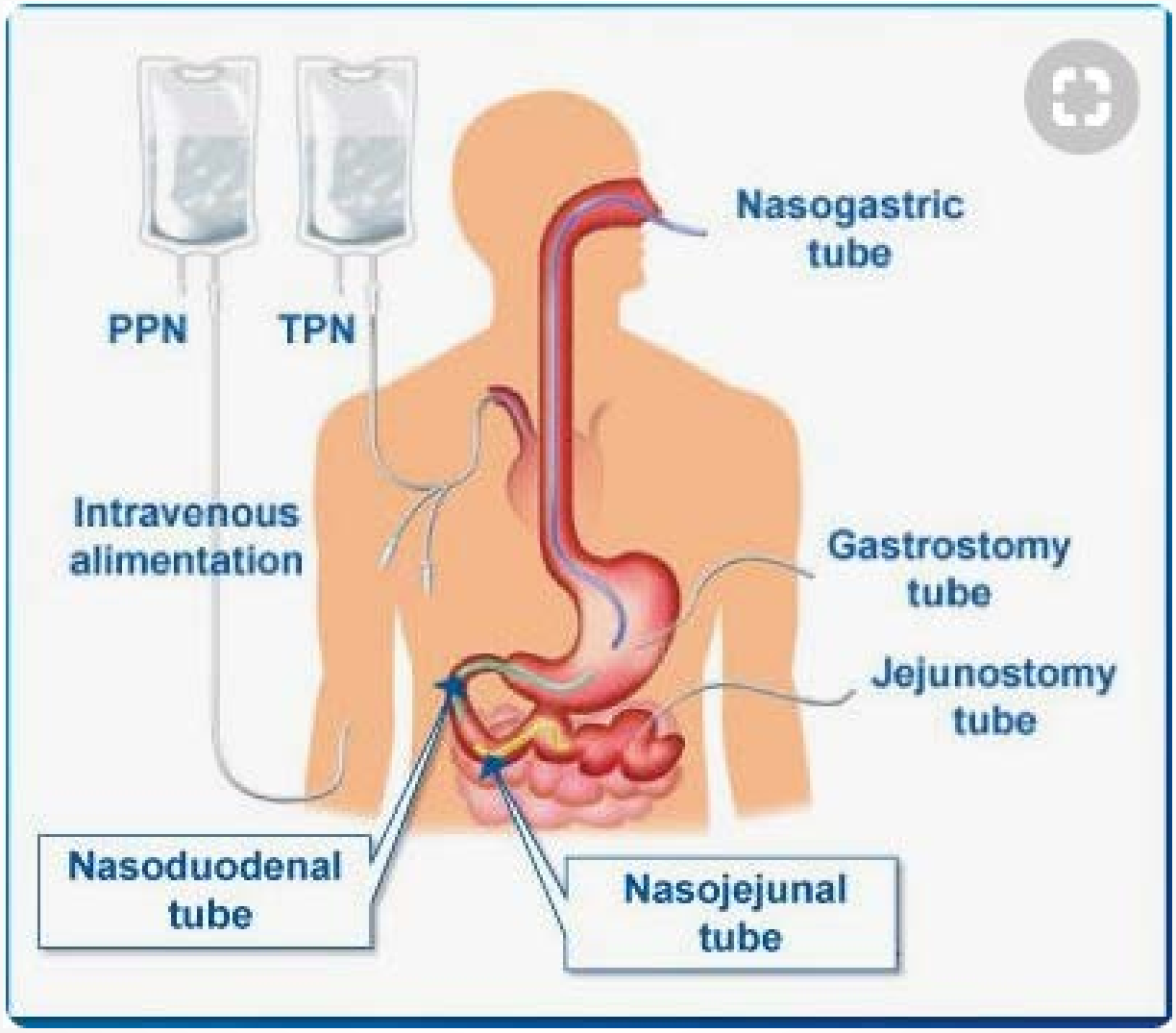
Click on a title in the pathway below to jump directly to that section.

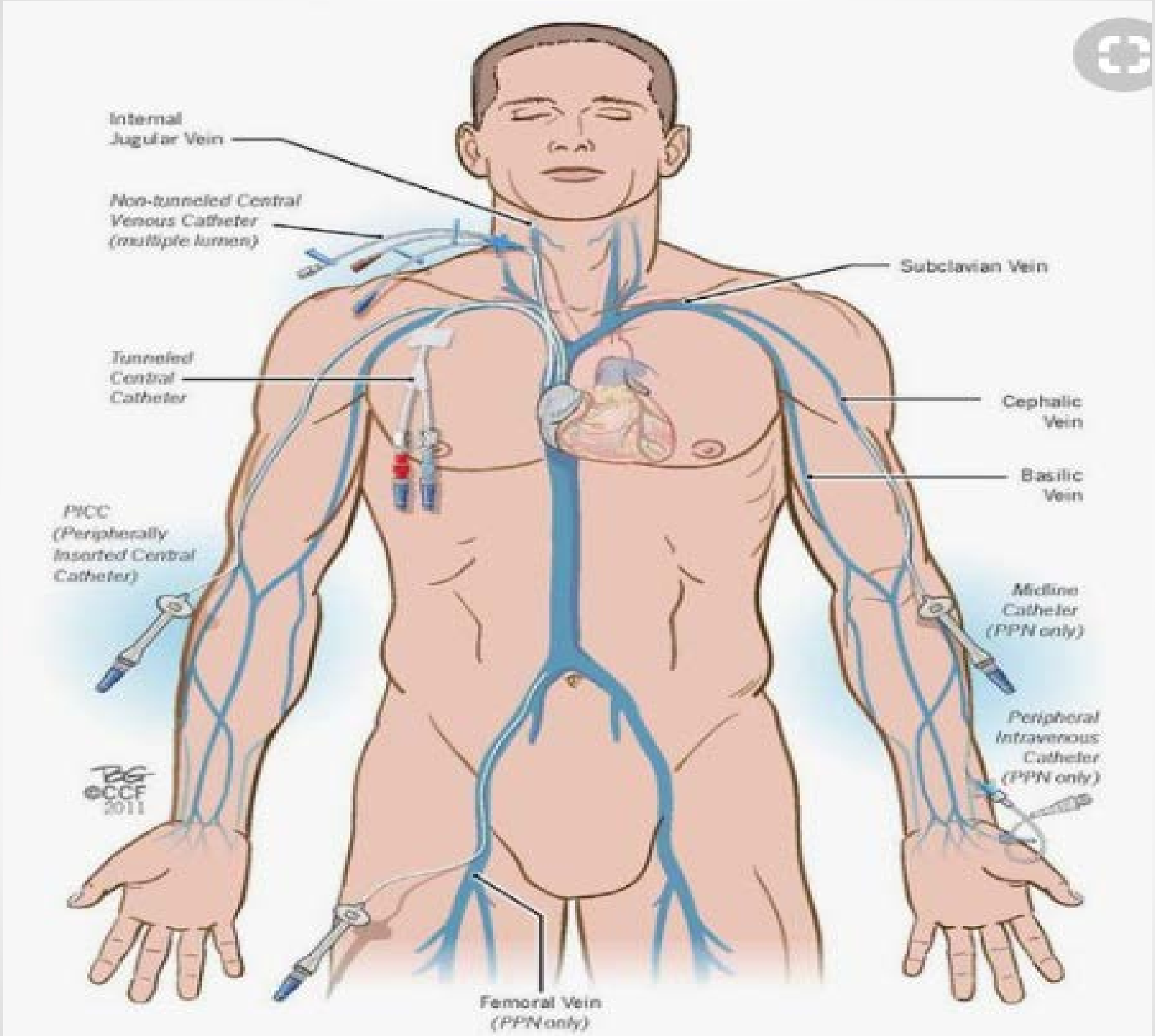


Special Considerations

- **Hyperglycemia, Diabetes Mellitis or insulin resistance**
- **Decreased cardiac output/renal insufficiency**
- **Retention of Pco2 (respiratory diseases/infections)**
- **Severe electrolyte imbalance**
- **Patients with egg allergies should be given fat free TPN due to its phospholipid content.**
- **Patients with liver disease**
- **Hypochloremic metabolic acidosis**
- **Hyperosmolality**

Routes


PPN
TPN
Nasogastric tube
Intravenous alimentation
Gastrostomy tube
Jejunostomy tube
Nasoduodenal tube
Nasojejunal tube


Internal
Jugular Vein
Non-tunneled Central
Venous Catheter
(multiple lumen)
Subclavian Vein
Tunneled
Central
Catheter
Cephalic
Vein
Basilic
Vein
PICC
(Peripherally
Inserted Central
Catheter)
Midline
Catheter
(PPN only)
Peripheral
Intravenous
Catheter
(PPN only)
©CCF
2011
Femoral Vein
(PPN only)

Nutrition Assessment

- **Mandatory within 48 hours post admission.**
- **Dietitian consult mandatory once decision is undertaken to initiate PN**
- **Check weight and height of all patients who are FC1-2.**

Nutrient Recommendations

	General	Obesity
Calories	25-35 kcal/day	11-14 kcal/kg body weight if BMI 30-50 22–25 kcal/kg ideal body weight per day if BMI >50.
Glucose	Infusion ideal CHO infusion is <0.25 g/kg/hour according to ASPEN and not exceed 7g/kg/d in adults.	
Protein	1.2-2.5 g/kg/day	2 g/kg ideal body weight/day if BMI 30-40 and 2.5g/kg ideal body weight/day if BMI >40
Fat	IVFE infusion rate should not exceed 0.11g/kg/hour (if SGPT and bilirubin are normal)	

Daily electrolyte additions to Adult PN Formulation

Calcium	10-15 mEq
Magnesium	8-20 mEq
Phosphorus	20-40 mMol
Sodium	1-2 mEq/kg
Potassium	1-2 mEq/kg
Chloride	As needed to maintain acid/base balance

Component	Dose
Ascorbic Acid	200 mg
Retinol	1 mg
Thiamin	6 mg
Riboflavin	3.6 mg
Pyridoxine	6 mg
Niacinamide	40 mg
Cyanocobalamin	5mcg
Biotin	60 mcg
Folic acid	600 mcg

Line Access:

There should be a proper access for parenteral nutrition i.e. PICC line, central venous catheter or Hickman.

DO NOT USE MEDICINE PORTS FOR PN

Parameter	Initiation	Stable Patients
HB, HCT, WBC, lymphocytes	-	Weekly
INR, PT, PTT	-	Weekly
Electrolytes(Na, K, Cl, Mg, Co2, Ca, Phosphorus, BUN, Cr)	Daily x3	1-2 times/week
Serum triglycerides	Day 1	Weekly
Serum glucose	Daily x3	1-2 times/week
Weight	Daily	2-3 times/week
Intake and output	Daily	Daily unless fluid status assessed by physical exam

Calculation and Hands on practice (1 hour)

Complications

- Hyperglycemia
- Hypoglycemia
- EFA deficiency
- Hypertriglyceridemia
- Azotemia
- Refeeding syndrome
- Deranged LFTs
- Thrombophlebitis
- Fluid and electrolytes
- Vitamins
- Mortality

Special Disease States

- **Geriatrics**
- **Hepatology (alcoholic steatohepatitis, liver cirrhosis and acute liver failure)**
- **Surgery**
- **Gastroenterology (crohn's disease, ulcerative colitis, Short bowel syndrome)**
- **Cardiology and pneumology**
- **Pancreatitis**

Questions