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Improving Life on Nutrition Support

The Ins and Outs of Enteral and Parenteral Nutrition Therapy

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Objectives:

- To review home nutrition statistics.
- To understand the difference between EN and PN.
- To identify locations for EN and PN tubes and catheters.
- To give examples of the types of tubes and catheters used at home.

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Home Enteral Therapy Statistics

- 40,000 people receive parenteral nutrition in their homes in the U.S.

- 152,000 people receive enteral nutrition in their homes in the U.S.

On Top of the World

Rick Davis: Me "taking a drink" in the Grand Canyon through my MIC-KEY and extension tube with a 2 oz syringe. (From www.oley.org)

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Enteral vs. Parenteral Nutrition

- **Enteral Nutrition**
  - AKA Tube Feeding
  - Thru the GI tract
  - More physiological
  - Uses the gut
  - More convenient
  - Less risky
  - Less costly
- **Parenteral Nutrition**
  - AKA TPN, Hyperal
  - Thru a central vein, IV
  - Less physiological
  - Gives the gut a rest
  - Less convenient
  - More risk ie: infection
  - More costly

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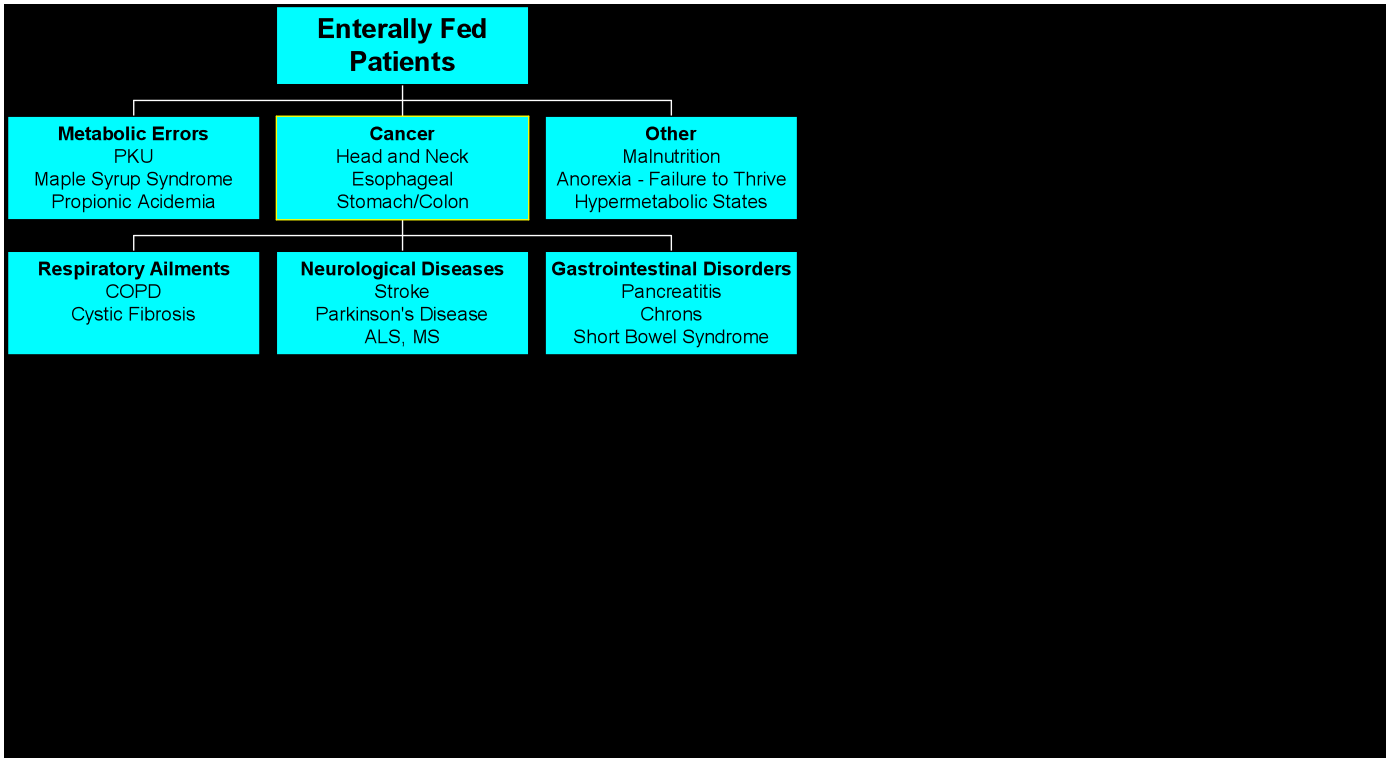
Common Diagnoses for Home Tube Feeding



***Cancer and Neurological Diseases make up ~70% of the enterally fed population**

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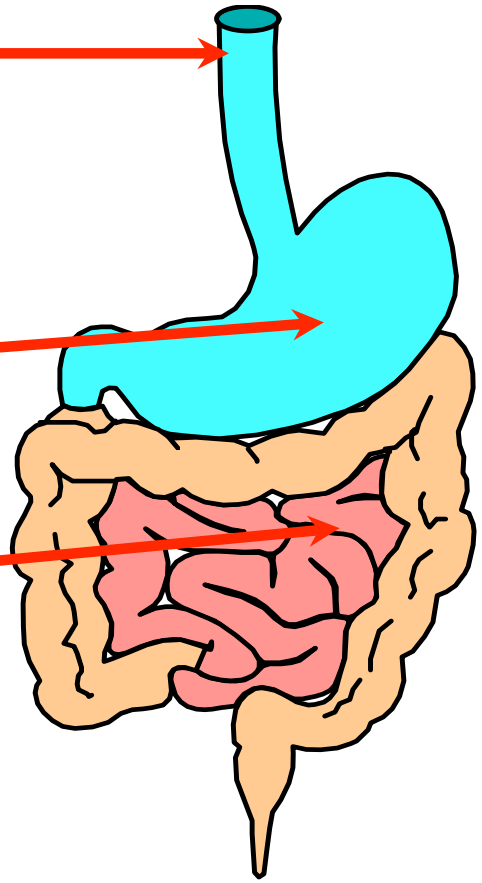
Enteral Tube Location

- Nasogastric
  - Through the nose to the stomach
- Nasointestinal
  - Through the nose to the small intestine
- Gastrostomy
  - Surgically: through the stomach wall
  - Placed with an Endoscope (PEG)
- Jejunostomy
  - Surgically: through the abdominal wall to the small intestine
  - Placed with an Endoscope (PEJ)



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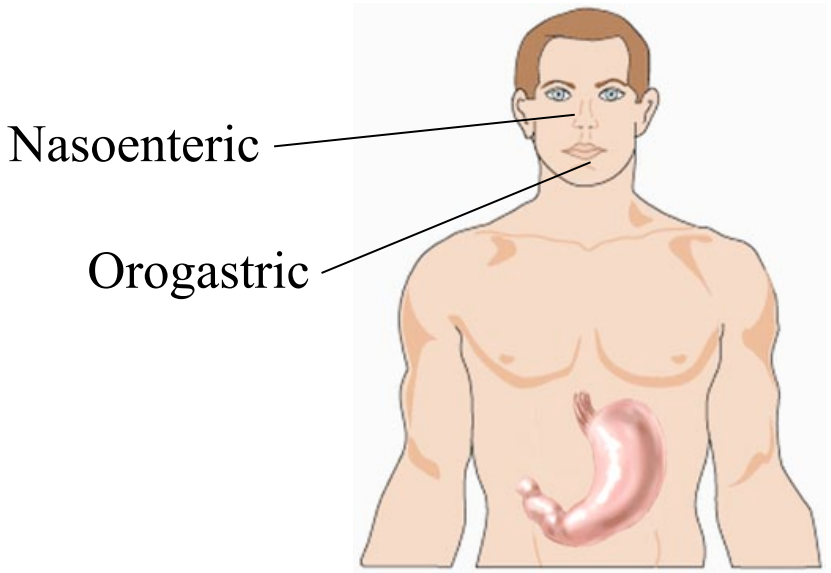
Feeding Route Selection: *Short Term*

- Orogastric
- Nasoenteric
  - nasogastric
  - nasoduodenal
  - nasojejunal



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Nasogastric / Nasoenteric: *Characteristics*

- Short-term feeding: < 6 - 8 weeks
- Usually small diameter
- Contraindications to nasogastric tubes
  - significant GER
  - aspiration risk
  - delayed gastric emptying
- Potential complications include:
  - sinusitis
  - nasal erosion
  - tube displacement
  - aspiration (with GER)

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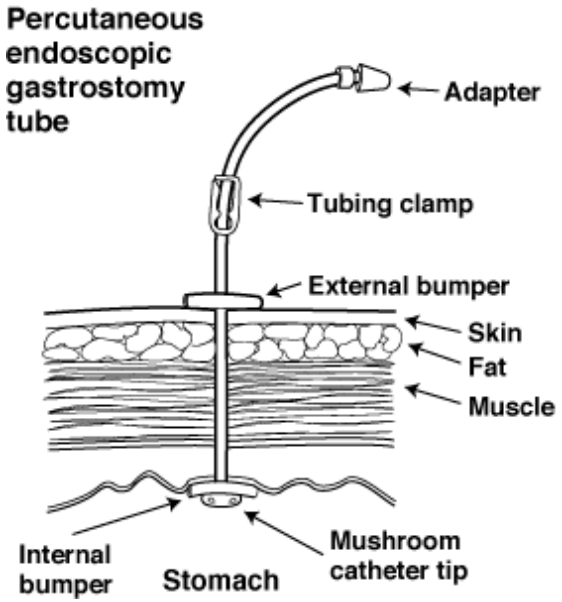
Feeding Route Selection: *Long-term*

- Endoscopic or Radiologic
  - PEG
  - PEG-J
  - PEJ
- Surgical
  - Gastrostomy
  - Jejunostomy



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Gastrostomy: *Characteristics*

- Appropriate for long-term feeding
- Requires normal gastric emptying
- Contraindications:
  - significant reflux or aspiration
- May be placed by surgical, endoscopic or radiologic techniques
- Potential complications include:
  - infection
  - leakage
  - fistula
  - buried bumper
  - perforation

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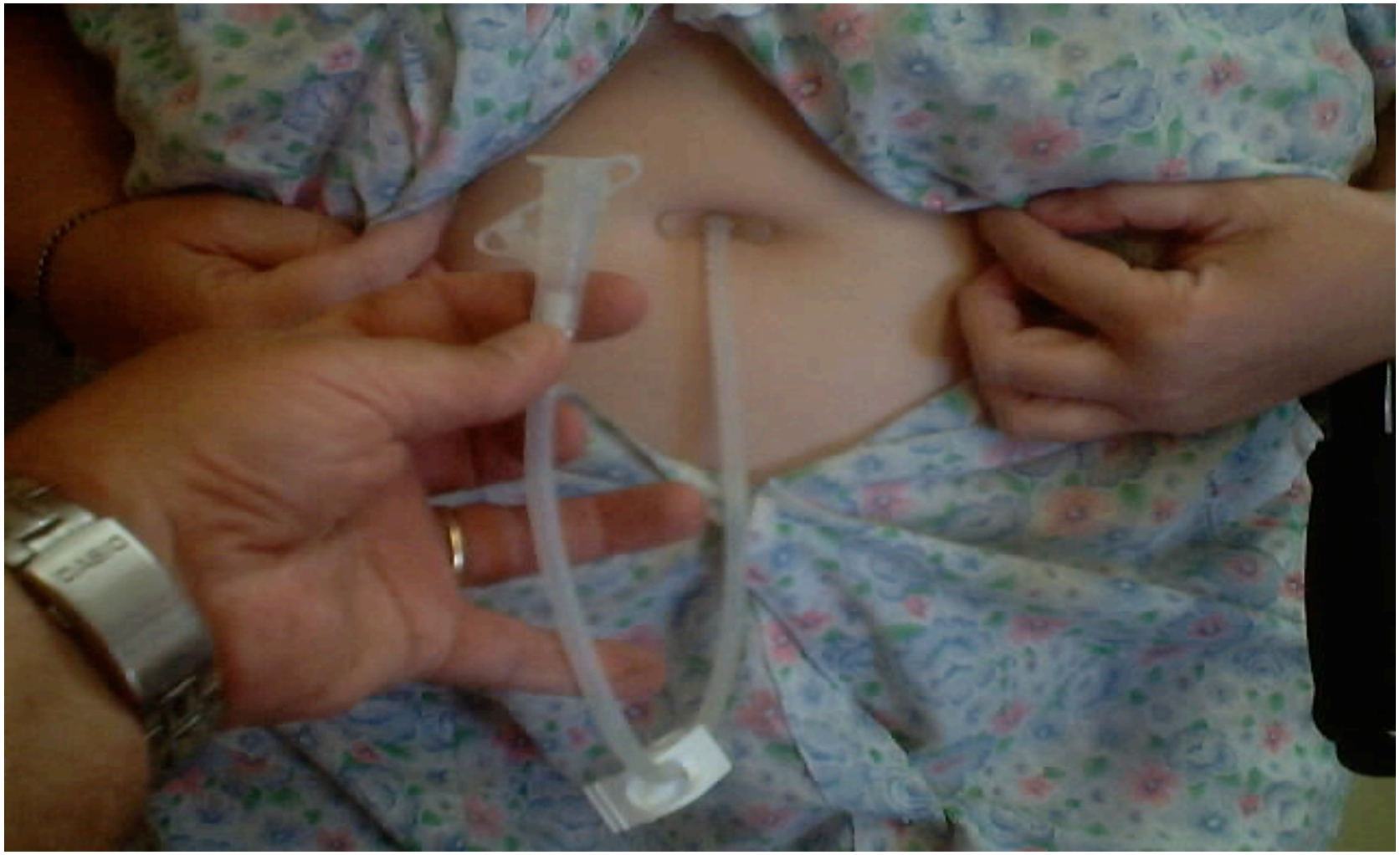
Gastrostomy Tube in Place



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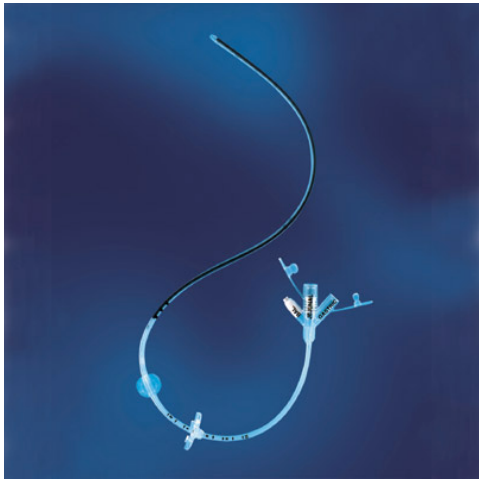
Jejunostomy: *Characteristics*

- Appropriate for long-term feeding
- Indicated for patients with aspiration or poor gastric emptying
- May be placed by surgical, endoscopic or radiologic technique
- **Typically requires feeding pump**
- Potential complications include:
  - infection
  - tube occlusion
  - intestinal ischemia
  - bowel obstruction



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Low Profile Device: *Characteristics*

- Appropriate for long-term feeding
- Beneficial for:
  - active lifestyle
  - cosmetic purposes
  - agitated patient with risk for pulling out tube
  - possible replacement in the home
- Potential complications include:
  - balloon malfunction
  - improper insertion
  - leakage

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DEHP ???

- Di(2-ethylhexyl) phthalate
- Plasticizer which softens PVC
- Found in feeding bags and tubes
- Associated with liver toxicity in animals
- Lipids leach DEHP from PVC
- Kids > risk than adults
- Some products are DEHP-free

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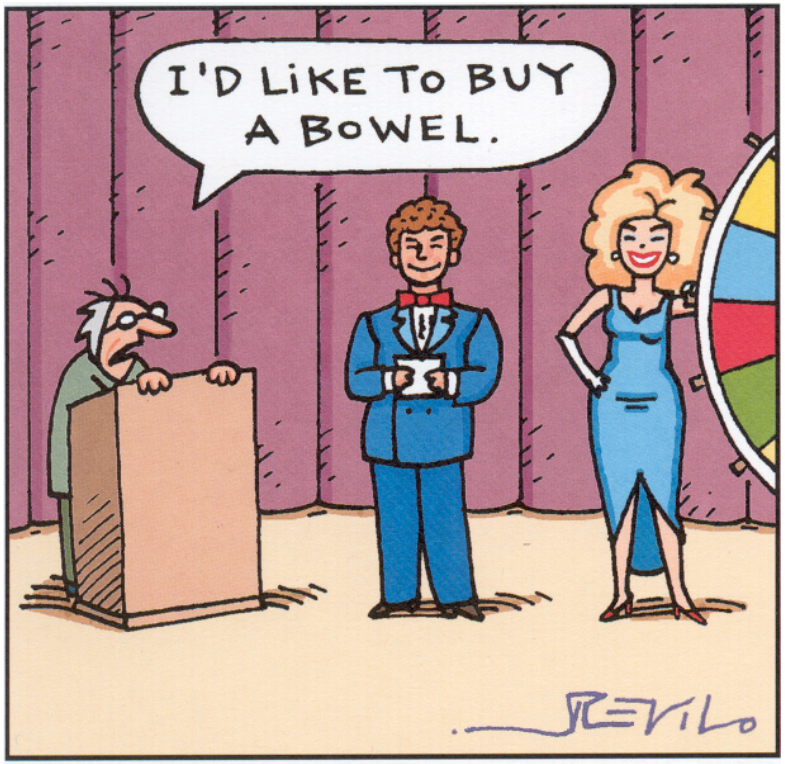
Parenteral Nutrition



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Diagnoses Associated with Home TPN

- Malabsorptive Disorders
  ie: Short Bowel, Crohn's, scleroderma
- Motility Disorders
  ie: ischemic bowel, mitochondrial disease
- Bowel Obstruction
  ie: GI and gynocologic oncology
- Pancreatitis
- Intractable vomiting or diarrhea

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Parenteral Nutrition Access
Peripheral (PPN) vs Central (TPN)

- **PPN**
  - < 10% carbohydrate
  - peripheral line
    ie: peripheral, mid-line
  - high volume required
  - low in calories
  - low infection risk
- **TPN**
  - > 10% carbohydrate
  - central line
    ie: hickman, PICC, broviac
  - can concentrate volume
  - higher in calories
  - higher infection risk

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Venous Access Options for HPN

- Short Term Access
  - Peripheral lines
  - Midlines
- Long Term Access
  - PICCs
  - Tunneled catheters
  - Implanted ports

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Long Term Access: Central Catheters

- **Non-Surgical**

  PICC:

  Peripherally Inserted Central Catheter

- **Surgical**

  Tunneled Catheters:

  Hickman, Groshong, Broviac

  Port-A-Caths

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Long Term: PICC Lines

- Long line (14-20”) placed above elbow, extending into central circulation
- For mid range therapy (6-12 weeks) or longer??
- X Ray confirmation necessary
- Can be inserted at bedside
- Easy to remove
- Higher risk of occlusion, dislodgement and malposition than Tunneled CVCs
- Can be used for Parenteral Nutrition

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PICCs

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Long Term: Tunneled Catheters

- Long line surgically tunneled under skin, extends into central circulation
- For long term therapy
- X Ray confirmation necessary
- Catheter tubing extends out from the skin level (approximately 1 foot extension)
- Brand names: Groshong, Hickman (adult), Broviac (pediatric)
- Requires experienced MD to insert
- Can be used for PN

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Tunneled

- Hickman™ (BARD)
- Broviac™ (BARD)
- Groshong™ (BARD)

Hickman® Cuffs

VitaCuff Antimicrobial Cuff

SureCuff Tissue Ingrowth Cuff

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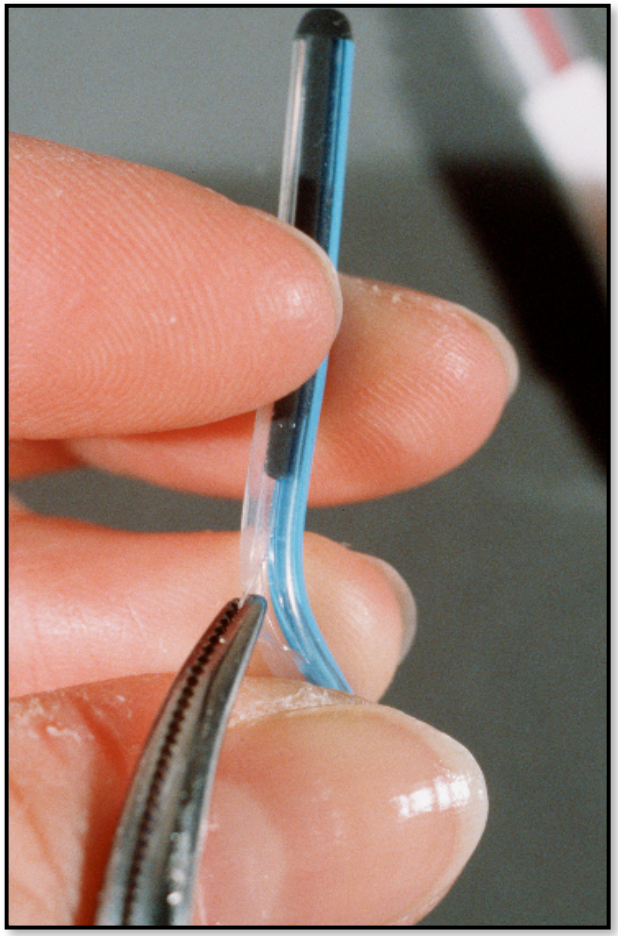
Device Tips

Hickman



Groshong

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Groshong® Valve

BARD® Groshong®

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Long Term: Implanted Ports

- Short catheter (6”) surgically placed under the skin of the chest or abdomen extending into central circulation
- Indicated for long term, intermittent therapy
- Port access using a special needle: Huber
- Weekly Huber needle change required
- Best used for intermittent therapies (chemotherapy, antibiotics)
- Seldom inserted for PN alone

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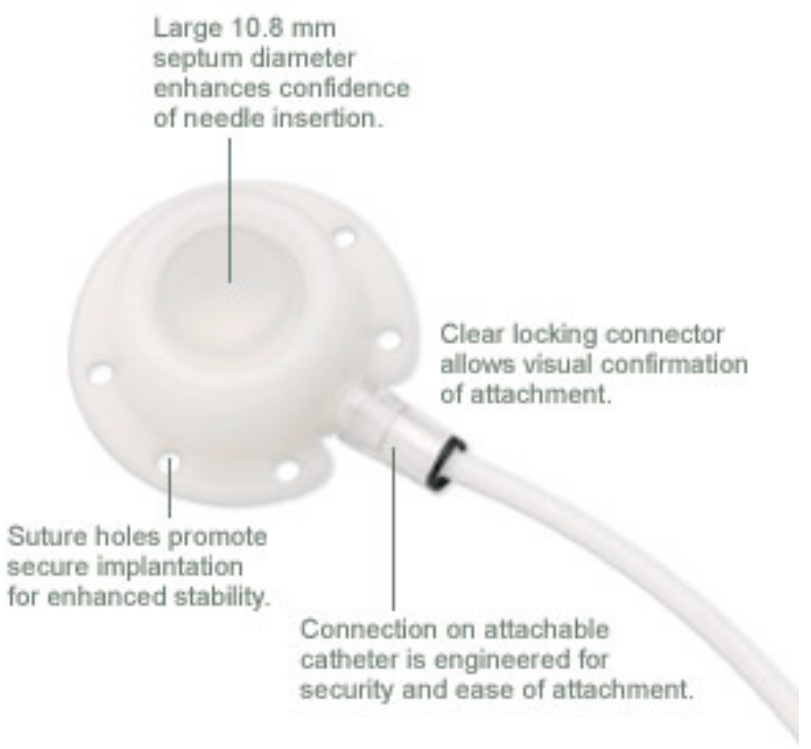
Ports

- M.R.I.™ Low-Profile Implanted Port

(BARD Access Systems)



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In Summary:

- The number of people at home on enteral nutrition is growing.
- Enteral Nutrition is preferred route of feeding when possible.
- Parenteral Nutrition can be safely given through a variety of catheters.
- Catheters, caps and other IV devices are designed to minimize infection.

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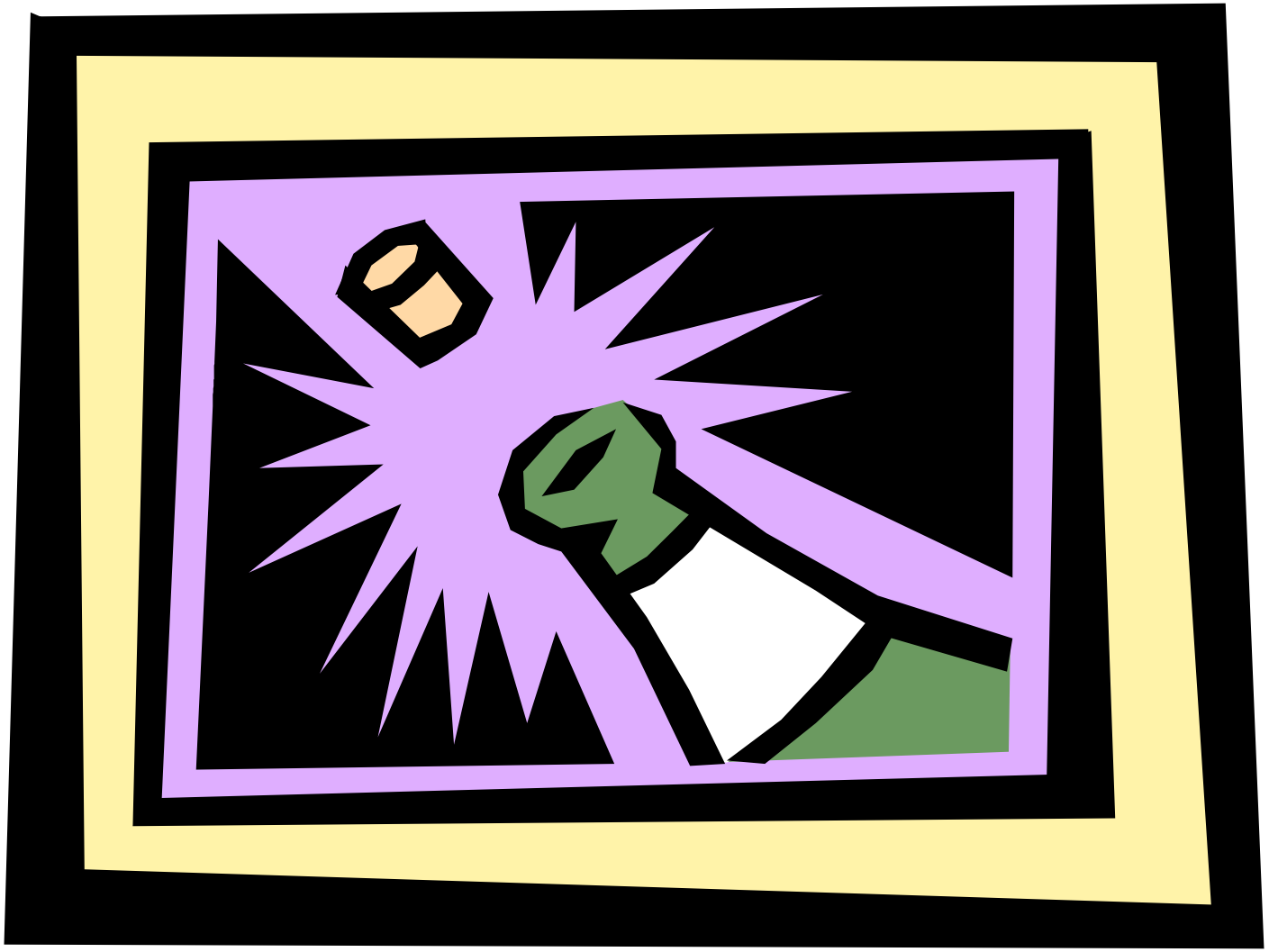

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