Percutaneous Endoscopic Gastrostomy

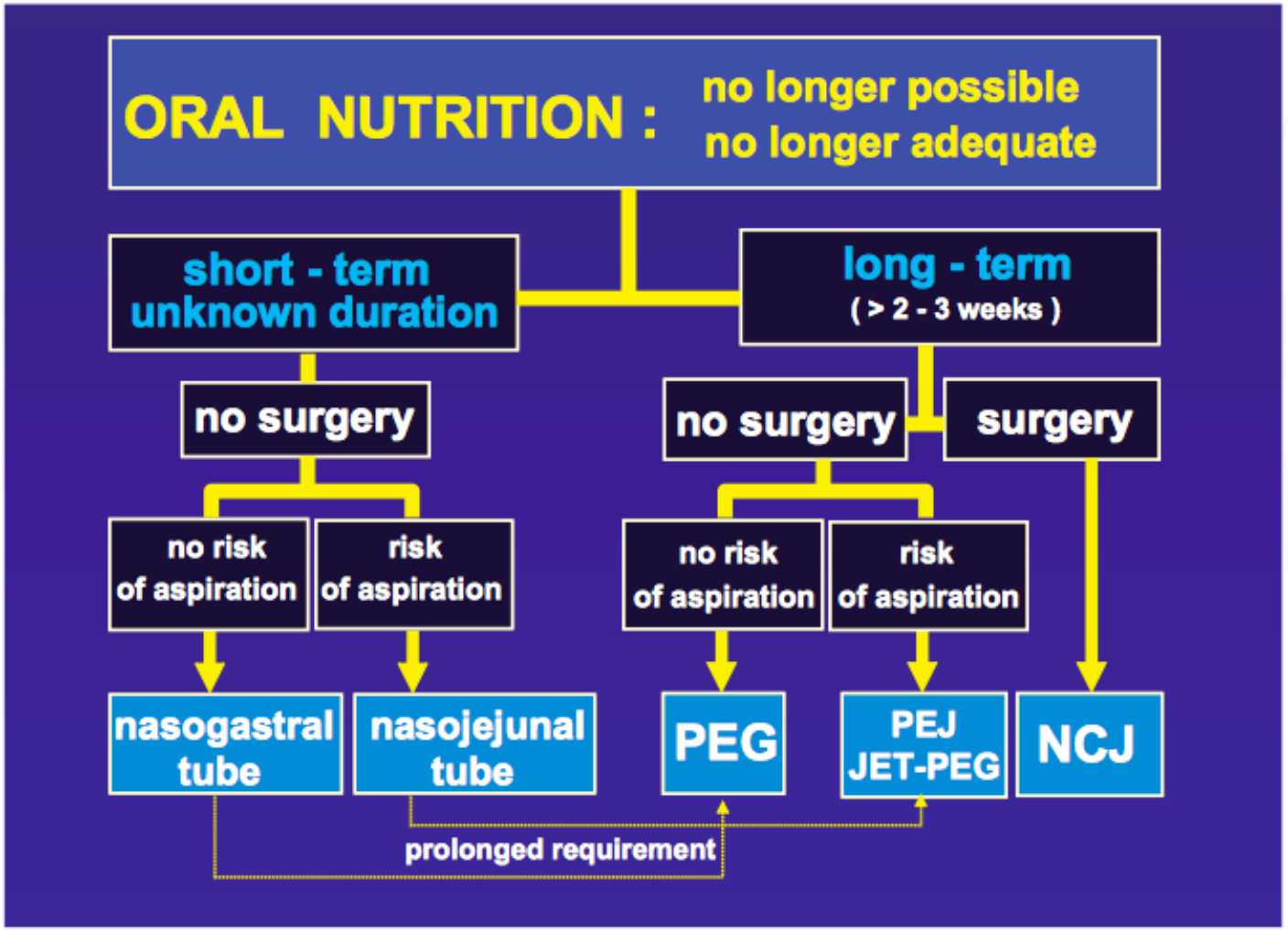
With Thanks to Prof Stuart Roberts

The Alfred

What is a PEG?

- A PEG is a Percutaneous, Endoscopic Gastrostomy tube as distinct from a:
  - Radiologically Inserted Gastrostomy tube (RIG)
  - Surgical gastrostomy tube
- One of many options for providing enteral feeding:
  - Nasogastric
  - Nasoduodenal/Nasojejunal
  - Endoscopic or radiologically inserted jejunostomy
  - Surgical jejunostomy
  - Cervical pharyngostomy, Oesophagostomy

Why a PEG?



Loser et al. Clin Nutr. 2005

Why a PEG?

- The choice of a PEG versus a surgical gastrostomy tube or RIG depends on many factors including[1]:
  - Local resources, expertise, and waiting time
  - Anatomical and technical considerations
  - Surgical convenience

1. Vogt W et al. Gastrointest Endosc 1996; 43:138

Why a PEG

- Comparison between PEG and surgical gastrostomy tubes shows no difference in morbidity and mortality although PEG is less expensive and quicker to insert[1]

- Comparison between PEG and RIG show similar complication rate (10% vs. 13%)[2]
  - Although PEG's may be associated with lower rates of infection and peritonitis[3]

1. Stiegmann GV et al. Gastrointest Endosc 1990; 36:1
2. McAllister P. et al. Br J Oral Maxillofac surg 2013
3. Burkitt et al. Br J Oral Maxiolofac. 2011

Indications (definite)

Impaired ability to ingest nutrients:	Impaired absorption of nutrients
• Oropharyngeal, oesophageal tumours • Neurological disorders eg cerebrovascular accident, multiple sclerosis, motor neurone disease, trauma, Cerebral Palsy	• Surgical resection/bypass e.g. gastrectomy, small bowel resection • Malignancy of the gastrointestinal tract e.g. pancreatic cancer • Inflammatory disorders e.g. Crohn's disease • Short bowel syndrome • Gastrointestinal fistulae • Radiation enteritis
Swallowing disorders	**Increased/specialised nutrition requirements**
• Oropharyngeal dysphagia eg stroke, neurodegenerative conditions, head and neck cancer	• Chronic pulmonary disease eg Cystic Fibrosis • Chronic renal failure • Anorexia nervosa • HIV/AIDS • Metabolic and haematological disorders • Trauma

AusPEN: Clinical Practice Guidelines for Home Enteral Nutrition in Australia

Indications (possible)

- Malignancy
- Persistent vegetative state
- HIV/AIDS
- Replace nasoenteric feeding
- Enable transfer to long term facility
- Gastric decompression: gastroparesis, outlet obstruction

Kruse A et al. Endoscopy 2003:778-780
Westaby D et al. Gut 2010; 59:1592

Contraindications (absolute)

- Inability to safely perform upper GI endoscopy
  - Obstructing oesophageal tumour or stricture
  - Haemodynamic instability or sepsis
  - Intra-abdominal perforation
  - Active peritonitis
  - Anaesthetic CI
  - Uncorrected coagulopathy
- Marked ascites
- Gastric outlet obstruction (unless for decompression)
- Total gastrectomy
- Gastric malignancy

Kruse A et al. Endoscopy 2003:778-780
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Contraindications (relative)

- Terminal illness / advanced dementia
- Portal hypertension / gastric varices
- Oesophageal malignancy (seeding risk)
- Partial gastrectomy
- Prior abdominal surgeries (adhesions)
- Hepatomegaly (left lobe), Splenomegaly
- Morbid obesity
- Large hiatus hernia, severe GOR(D)
- Peritoneal dialysis

Kruse A et al. Endoscopy 2003:778-780

Mortality/morbidity influence by indication

- Recent study of 1518 Patients with PEG's inserted over a ten year period
  - Overall 30 day mortality = 7.6%
  - Mortality by disease group
    - Dementia = 23.5%
    - Non head/neck cancer = 18.5%
    - Learning disability = 14%
    - CVA = 12.3%
    - Neurodegenerative disease = 4.4%
    - Head & neck cancer 2.5%

Colby & Burch. Gut 2015

Pre-procedure management

- Informed consent
- Anaesthetic review (if GA required)
- FBE to assess platelet count: should be > 50,000
- Antiplatelet agents
  - Aspirin safe to continue
  - Clopidogrel cease 7D prior (liaise with parent unit re safety)
- Anti-coagulants
  - Warfarin: If indicated switch to low MW heparin
  - Low MW heparin: cease 6-8 hours prior
  - Direct acting oral anticoagulants (Dabigatran, rivaroxaban, apixaban): cease 24 hrs prior in those with normal renal function
- Fasting for at least 8 hours
- Mouth care

Antibiotic prophylaxis

- All patients should receive prophylactic antibiotics to reduce the risk of peri-stomal infection
- Choice of antibiotic depends on MRSA risk:
  - Low MRSA risk
    - IV cephazolin 2 gm 30-60 min pre-procedure
    - IV Clindamycin 900 mg within 60 min of procedure (in those with penicillin or cephalosporin hypersensitivity)
  - High MRSA risk
    - IV ceftriaxone 1 gm 30-60 min pre-procedure
    - IV vancomycin 15 mg/kg (max 2 gm) infused over 60 min

Banerje S et al. Gastrointest Endosc 2008; 67:791

PEG tube types

Initial tubes (bumper)

Replacement tubes (balloon)

Low profile (balloon/bumper)

PEG insertion kit

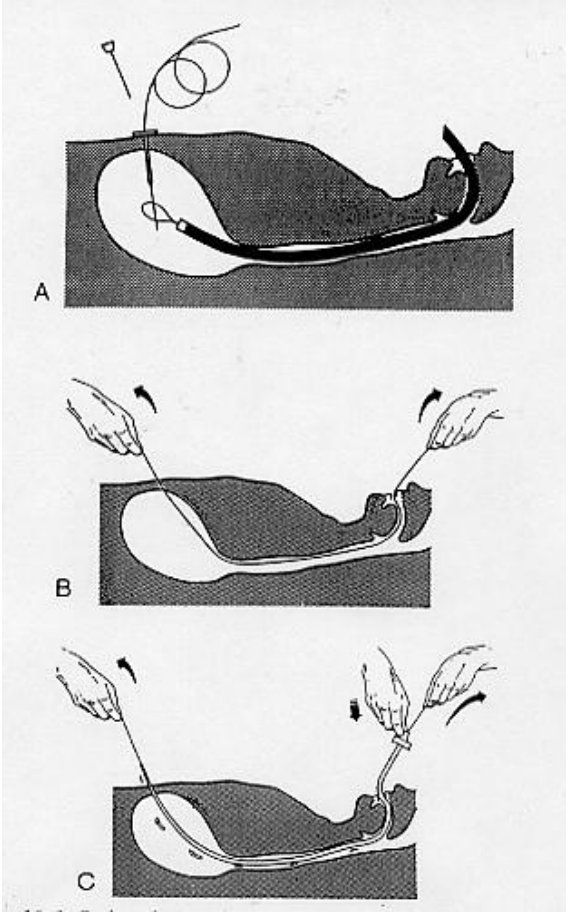
- Kit contains:
  - +/- local/syringe
  - introducer
  - +/- Prep & drape
  - Guidewire
  - Endoscopic snare
  - Scalpel/scissors
  - PEG
  - External Bumper
  - Connecting ports

PEG Techniques

- Pull *vs* push technique
- No outcome difference
- Pull
  - Most popular approach
  - Featured in this talk
- Push
  - Popular for radiologic approach
  - Similar to laparoscopic insertion technique

Pull Technique

- Guidewire placed in stomach
- Guidewire brought retrograde through patient's mouth
- PEG tube pulled through abdominal wall



PEG: Basics

- 2-person team needed with endoscopist plus assistant
- Gastric insufflation to bring stomach in apposition to anterior abdominal wall
- Placement of catheter into gastric lumen
- Passage of guidewire into stomach
- Placement of gastrostomy tube
- Verification of proper position

Patient Preparation

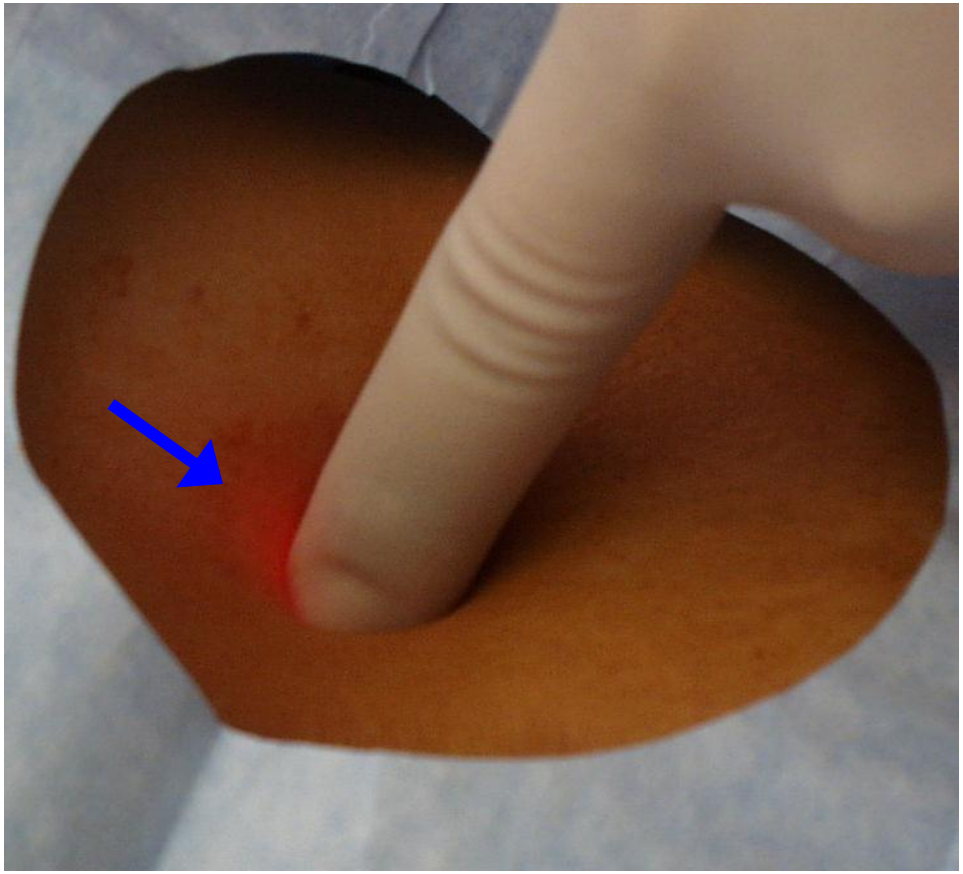
- Monitoring
  - ECG/heart rate
  - Blood Pressure
  - Pulse Oximetry
- Position
  - Supine
  - Lateral Decubitus
- Medications
  - Local pharyngeal anesthesia
    - Lignocaine spray
  - Deep sedation
  - Analgesia

Upper Endoscopy

- Routine flexible upper endoscopy
- *Complete* endoscopy recommended
  - 36% incidence of anomalies
  - Some may affect procedure
  - Aspirate gastric contents
  - Gastric insufflation

Confirm safe position

- Transillumination through skin suggests no other viscera interposed
- Transillumination button ("high beams") on light source
- May be difficult in obesity
  - Can assist with digital pressure



Confirm Position

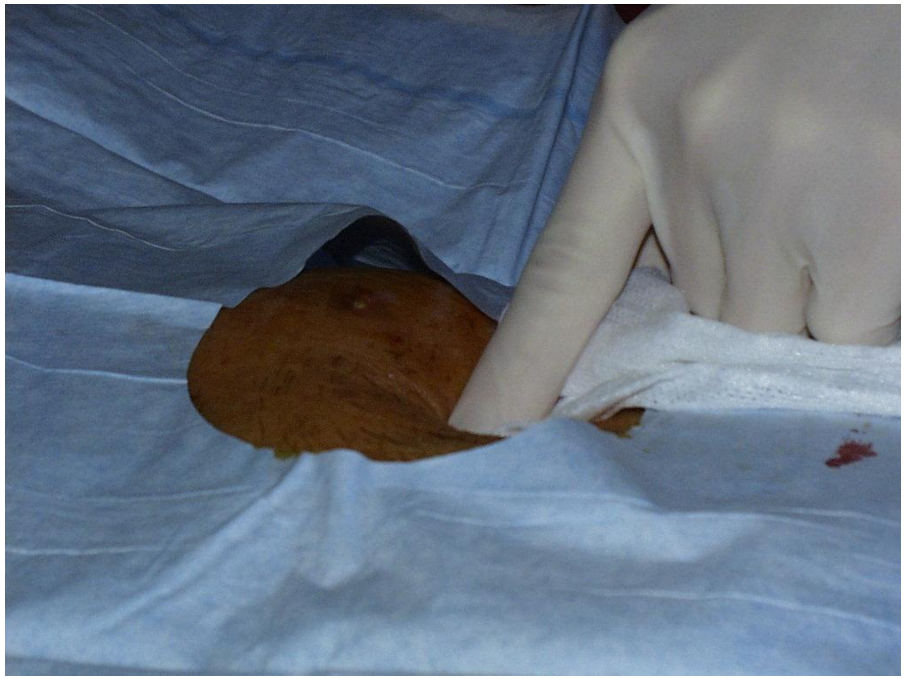
- Endoscopist watches while assistant indents abdominal wall at proposed insertion
- Should see simultaneous indentation of gastric mucosa
- Failure to see
  - Reassess position
  - Intervening viscera
  - Impossible apposition
  - Inadequate insufflation

Site Preparation

- PEG kit opened after endoscopic confirmation of entry site
- Select anticipated PEG site
  - Entry ~2 cm below costal margin
- Prep left upper quadrant with antiseptic prep of choice and drape

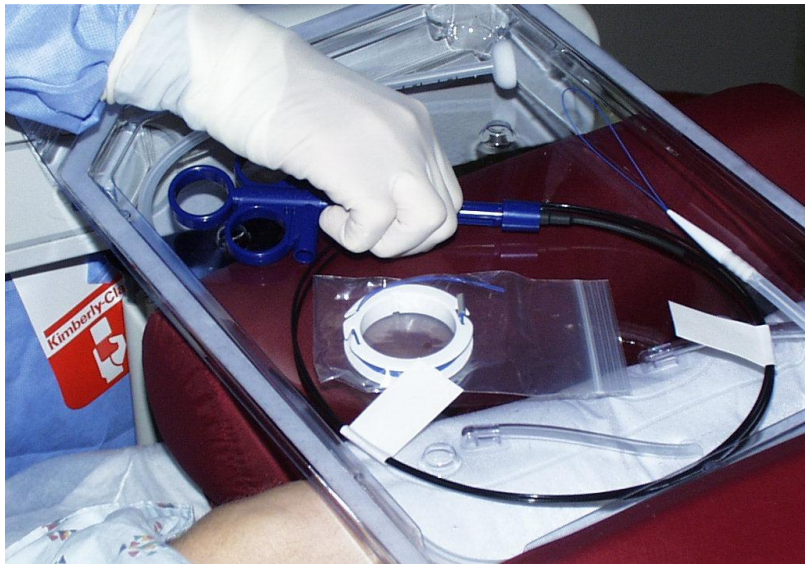
Surgical Technique

- With area prepped and draped, reconfirm insertion site
- Inject local anaesthetic
  - 5 ml 2% lignocaine
  - Skin and SQ
  - Fascia
- Make incision (0.5-1 cm)



Endoscopist

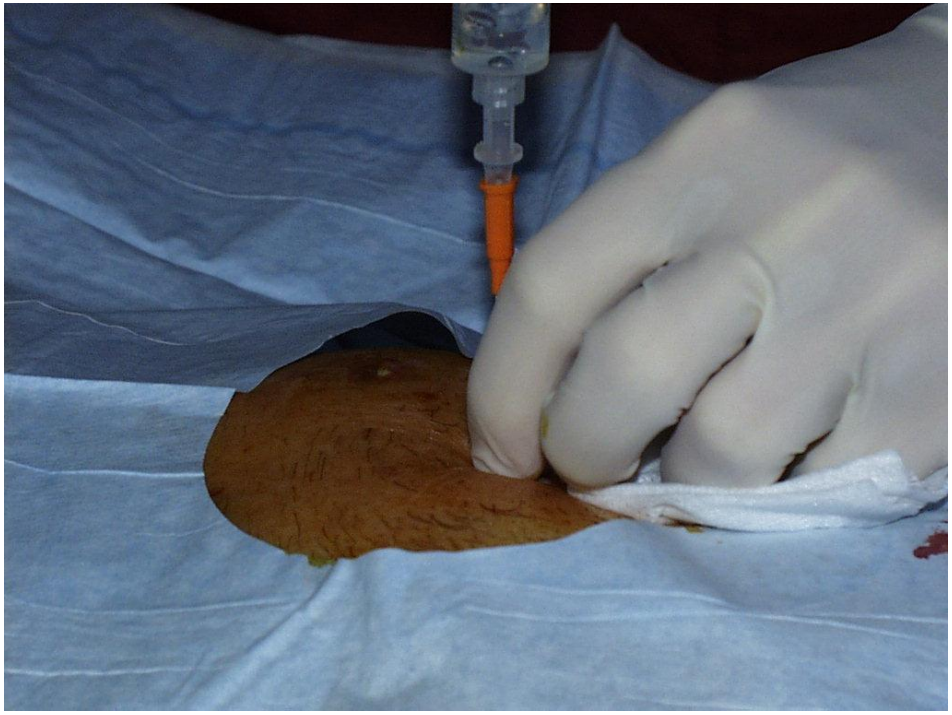
- Retrieves snare, PEG tube from kit



- Advances snare into biopsy channel of endoscope

Initial access

- Insert needle/catheter assembly
- Safe tract technique
  - Continuous aspiration via syringe
  - Return of air without seeing the needle in stomach signifies malposition
  - Remove, retry

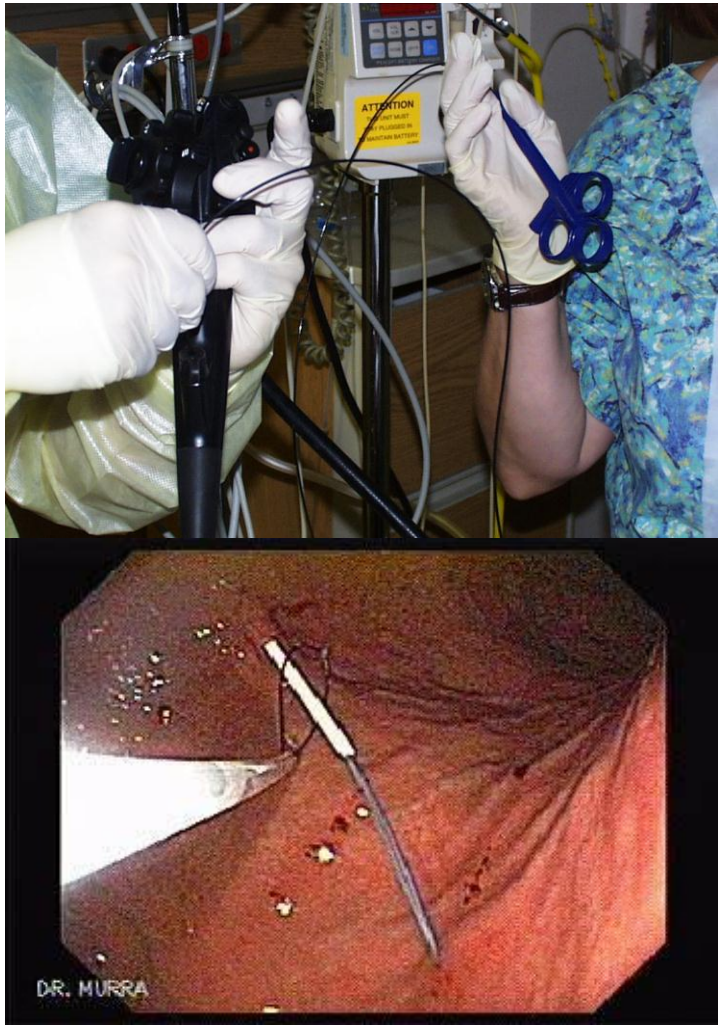


Access

- Remove syringe/needle
- Cover catheter to prevent loss of insufflation
- Advance guidewire into stomach

Endoscopist

- After wire passed through catheter, endoscopist uses snare to grasp wire
- Wire advanced
- Snare/wire pulled out of mouth with endoscope as a unit

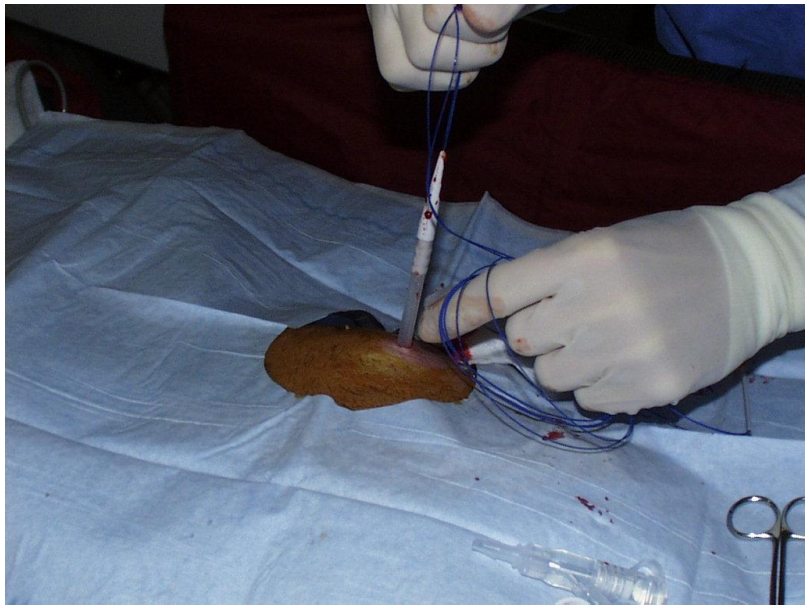


Endoscopist

- Endoscopist secures PEG tube to mouth end of guidewire
- PEG internal bumper can be snared to allow easy passage of endoscope
- Assembly passed back into stomach

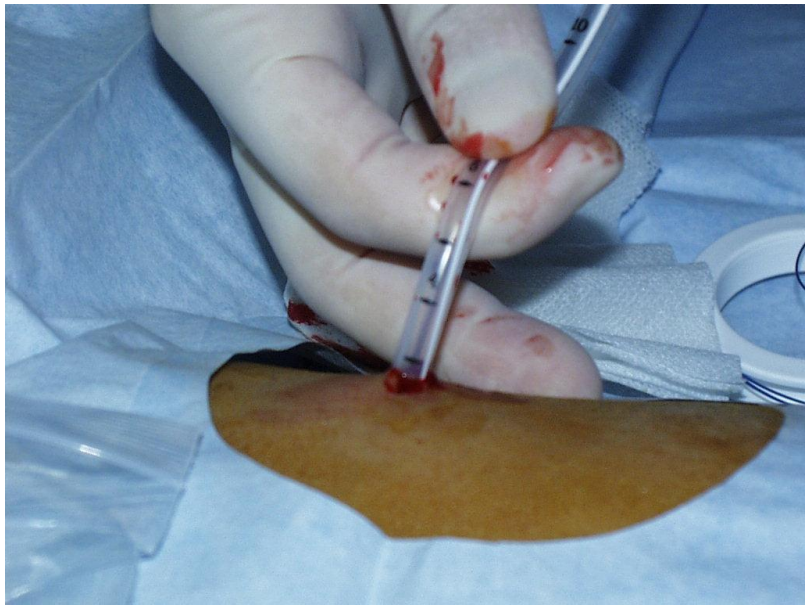
PEG Tube Position

- Guidewire pulled through skin incision
- PEG follows, tract dilated by conical dilator at end of PEG
- Counter traction at skin level with non-dominant hand facilitates passage



PEG Tube Position

- PEG tube advanced
  - Two resistance points
    - GE Junction
    - Final position @ gastric mucosa
- Usually in position when external marker between 2-4 cm at skin level



PEG Tube Position

- Guidewire cut at tapered end of tube
- External bumper applied over tube and slid to skin surface
- Bumpers should prevent movement but not blanch skin
- Relook endoscopy is usually done to confirm no blanching of mucosa

Completion of Procedure

- Snare placed into biopsy channel
- Endoscope removed
- Wound often cleaned with antiseptic prep or antibiotic cream
- Sterile dressing placed around external bolster
- Tube cut to appropriate length
- Adapter secured to cut end of tube

Immediate post-procedure management

- Patient care: rest in bed for 1-2 hrs post anaesthetic
- NPO for 4 hours post-procedure
- Water bolus (50 mls) via syringe hourly through tube for 2 hours
- Assuming water tolerated commence enteral feeding around 6 hours post-placement