Irish Society for Parenteral & Enteral Nutrition

Current perspectives in enteral and parenteral feeding

Julie Dowsett MSc FINDI

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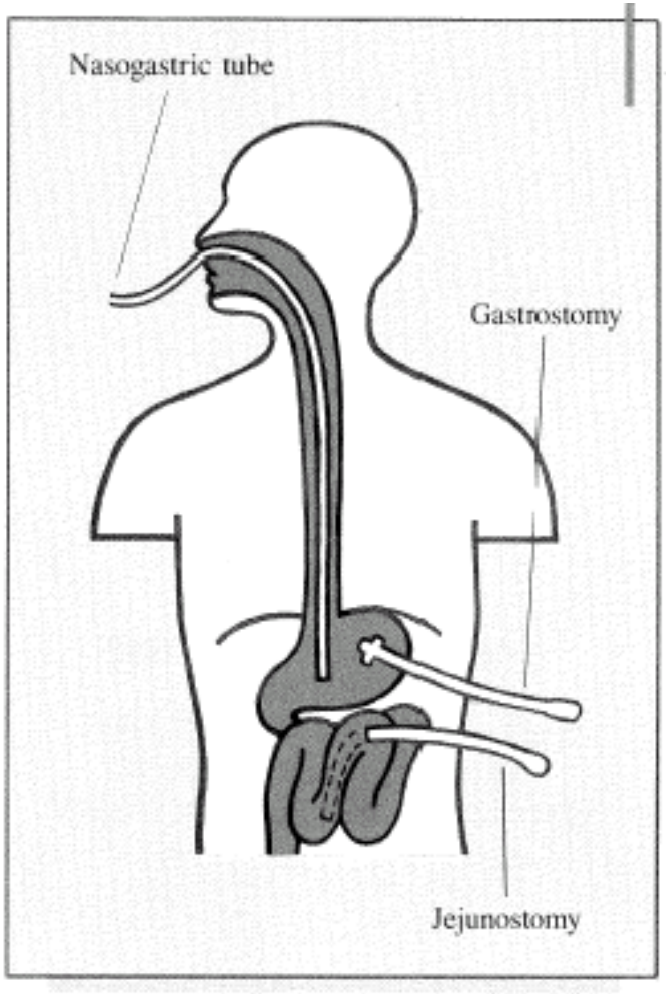
Outline of Talk

- Aims of nutrition support
- Who needs nutrition support?
- Enteral or parenteral?
- Refeeding syndrome
- Troubleshooting



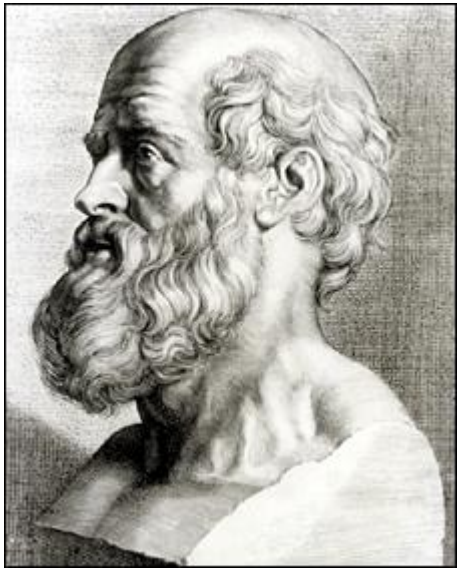
Aims of nutrition support

- Preserve lean body mass
- Promote immune and wound healing responses
- Sustain vital organ function
- minimise metabolic complications

‘first do no harm’

Avoid underfeeding

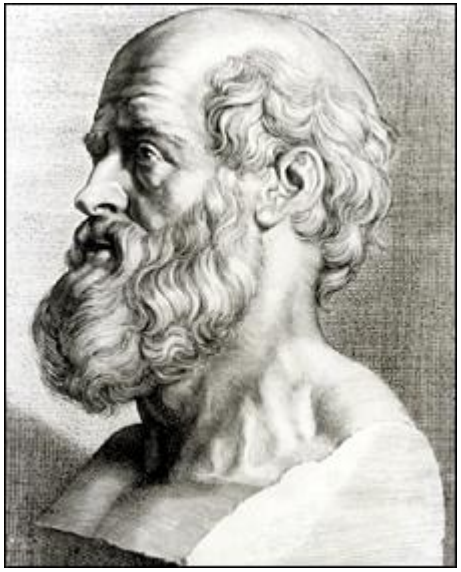
Avoid overfeeding



‘first do no harm’

Avoid underfeeding

- Malnutrition
- reduce immune function
- muscle breakdown
- compromise recovery



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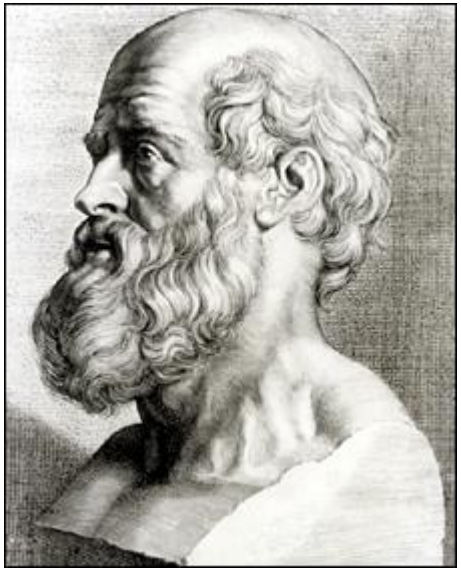

Avoid overfeeding

- Hyperglycaemia
  - phagocyte dysfunction
  - ↑ risk of infection
  - intracellular shifts of electrolytes
- Excessive CO_2 production
  - respiratory failure
  - prolonged vent requirements
- Organ system dysfunction
  - Hepatic (steatosis)
  - cardiac, resp, neurologic (refeeding)

Who needs nutrition support?

Those who are malnourished

- BMI <18.5
- wt loss >10% 3-6 months
- BMI<20 wt loss >5%

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Those at risk of malnutrition

- ↓ absorption
- ↑ needs due to disease
- Oral intake compromised for >5 days

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Interpretation of weight loss

Time interval	Significant weight loss	Severe weight loss
One week	<1-2%	>2%
One month	5%	>5%
3 months	7.5%	>7.5%
6 months	10%	>10%

Blackburn GL et al JPEN 1977

Why enteral?

- Maintains gut integrity, prevents gut stasis and prevents stress ulceration.

- Compared to PN, EN has
  - superior metabolic handling of nutrients,
  - less infectious complications
  - significant cost savings.

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- Compared to PN, EN has
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If the gut works…USE IT!

EN contraindicated in

- Gut ischaemia or prolonged ileus, MOF
- GI fistula or obstruction distal to the feeding tube
- Inaccessible GIT or extensive reduction of absorptive surface
- Intractable vomiting
- Imminent death

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Gastric emptying

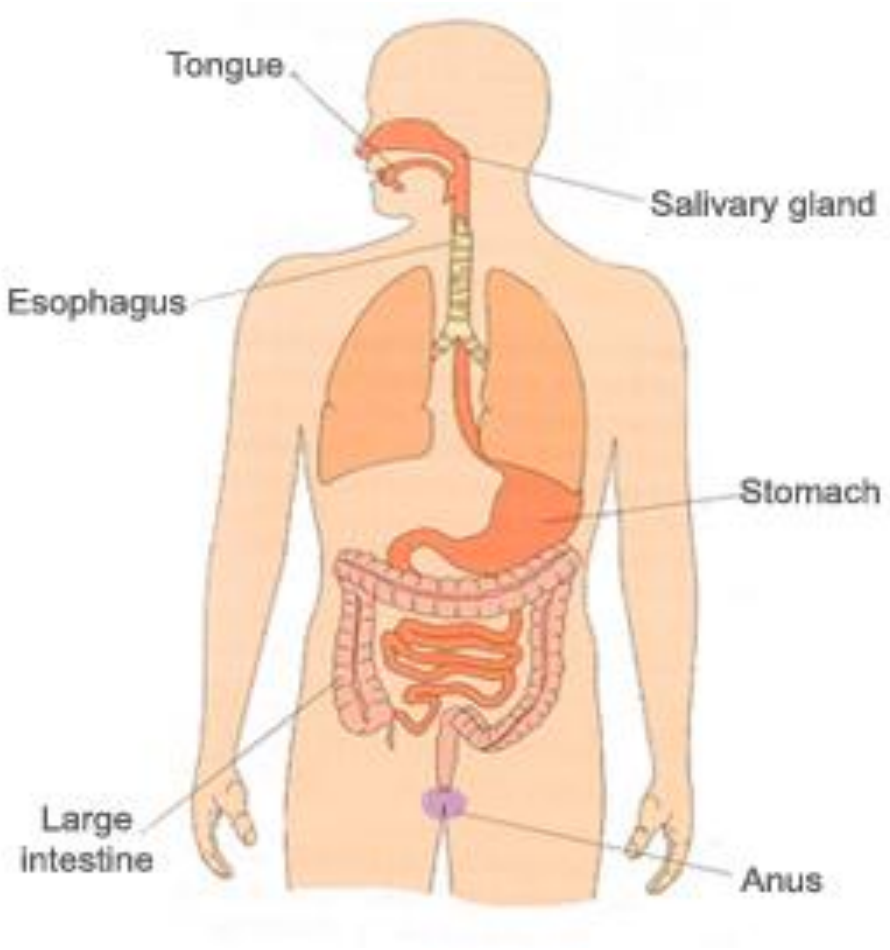
<u>Myoelectric Activity</u>

Small bowel 4-8 hrs

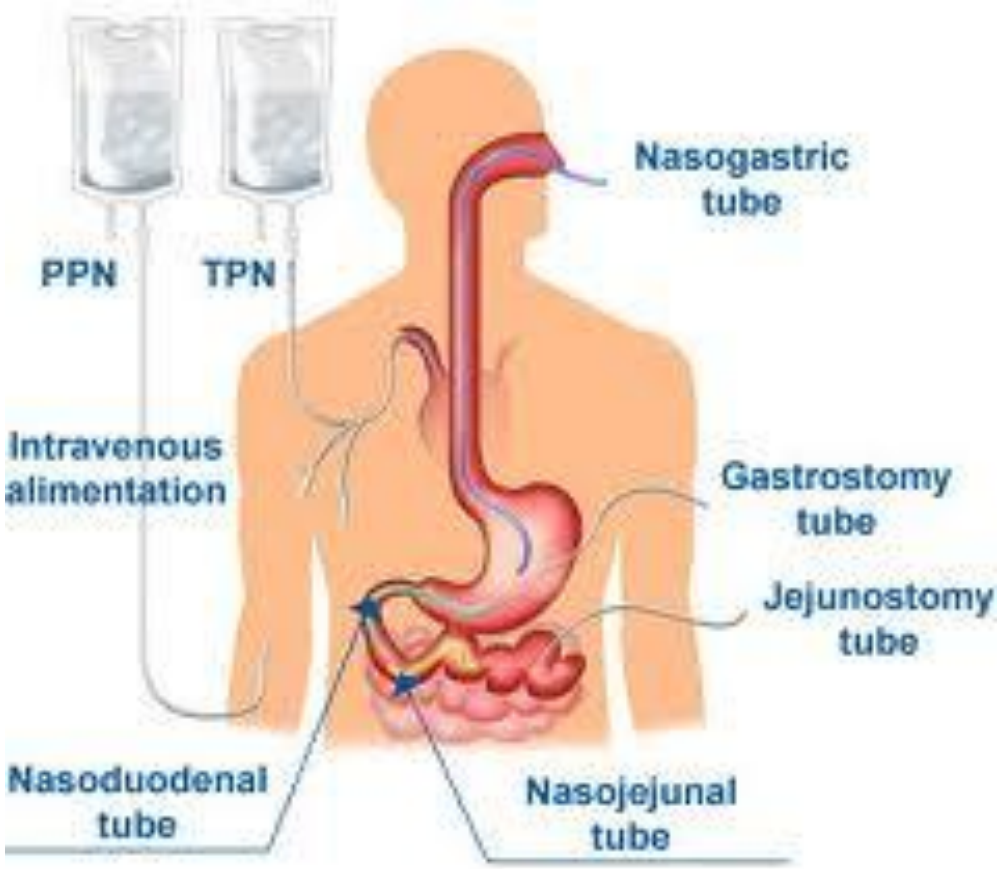
Stomach 24 hours

Colon 2-5 days

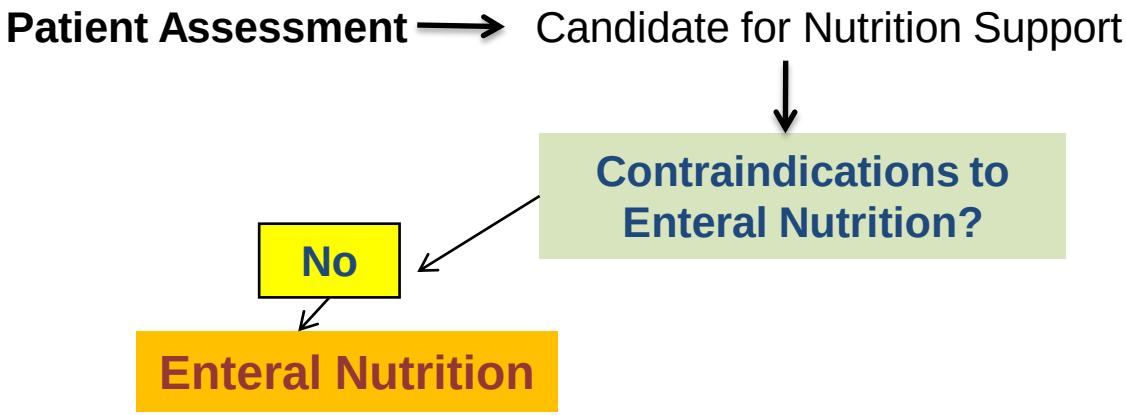
- Dopamine
- Morphine
- Propofol
- Hyperglycaemia
- Endotoxin production in sepsis



Feeding routes



Patient Assessment → Candidate for Nutrition Support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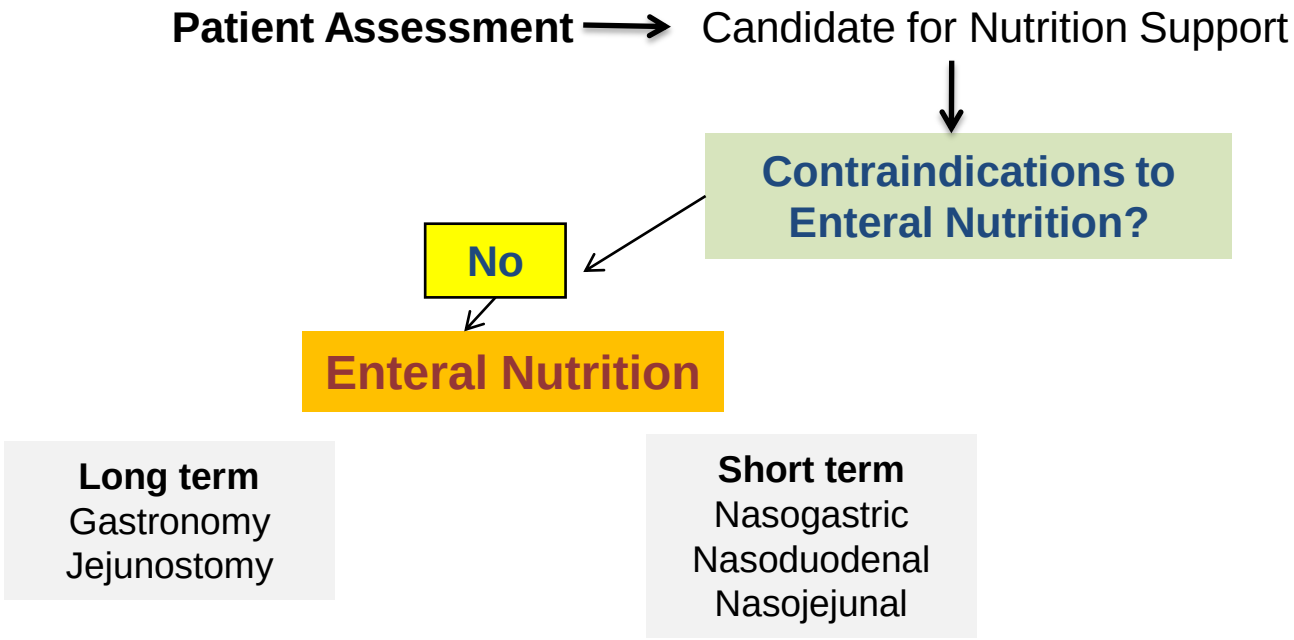
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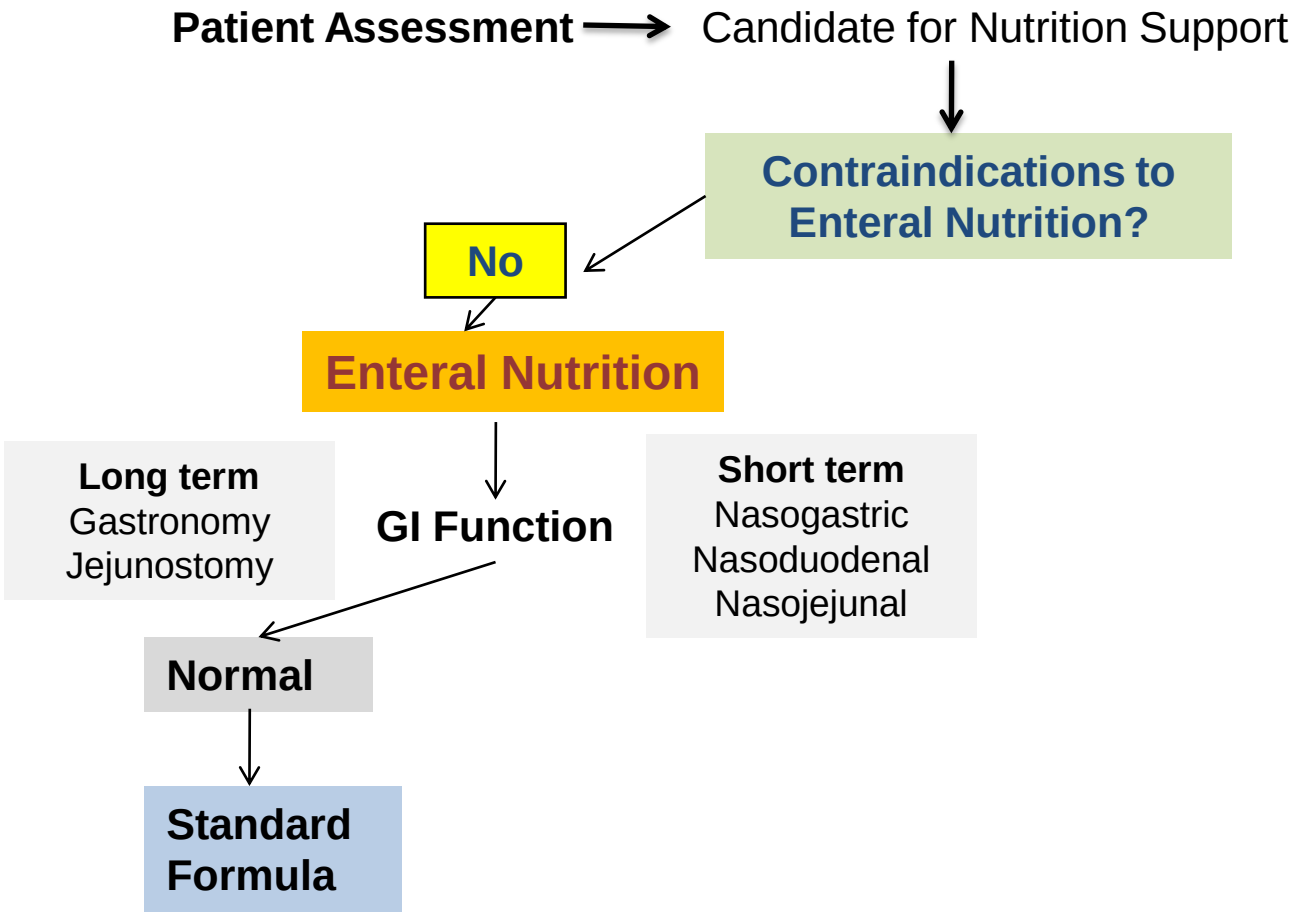
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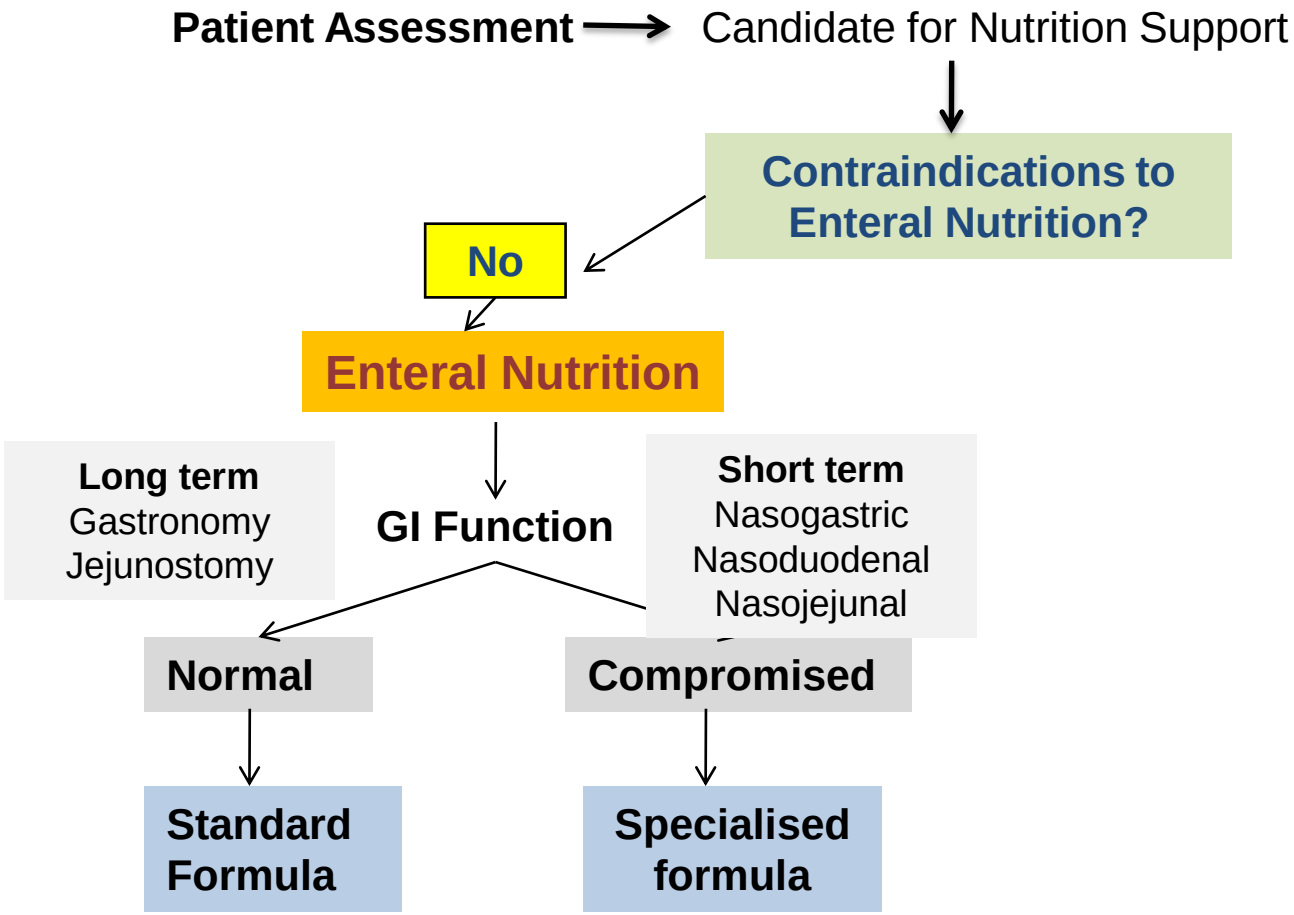
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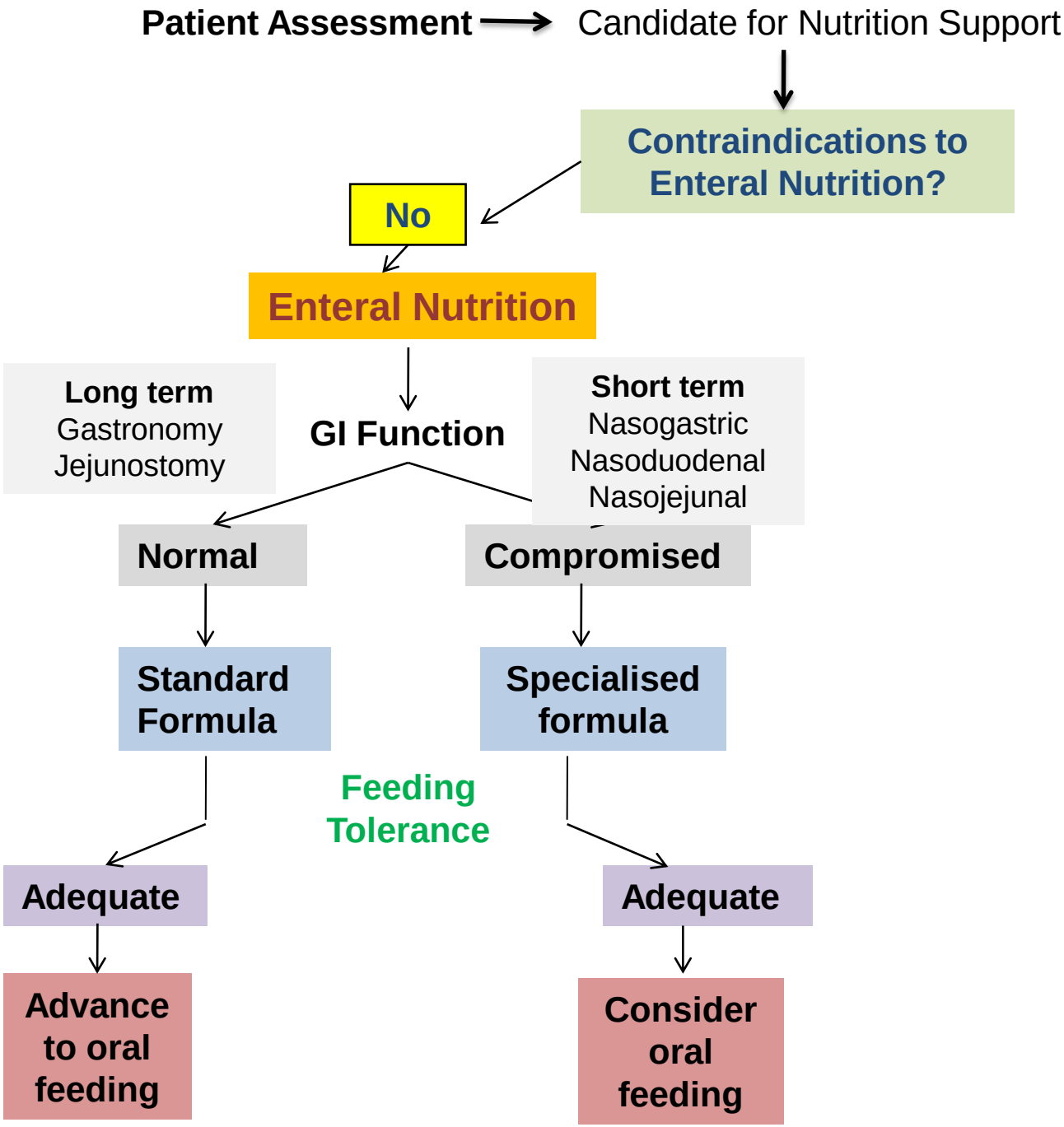
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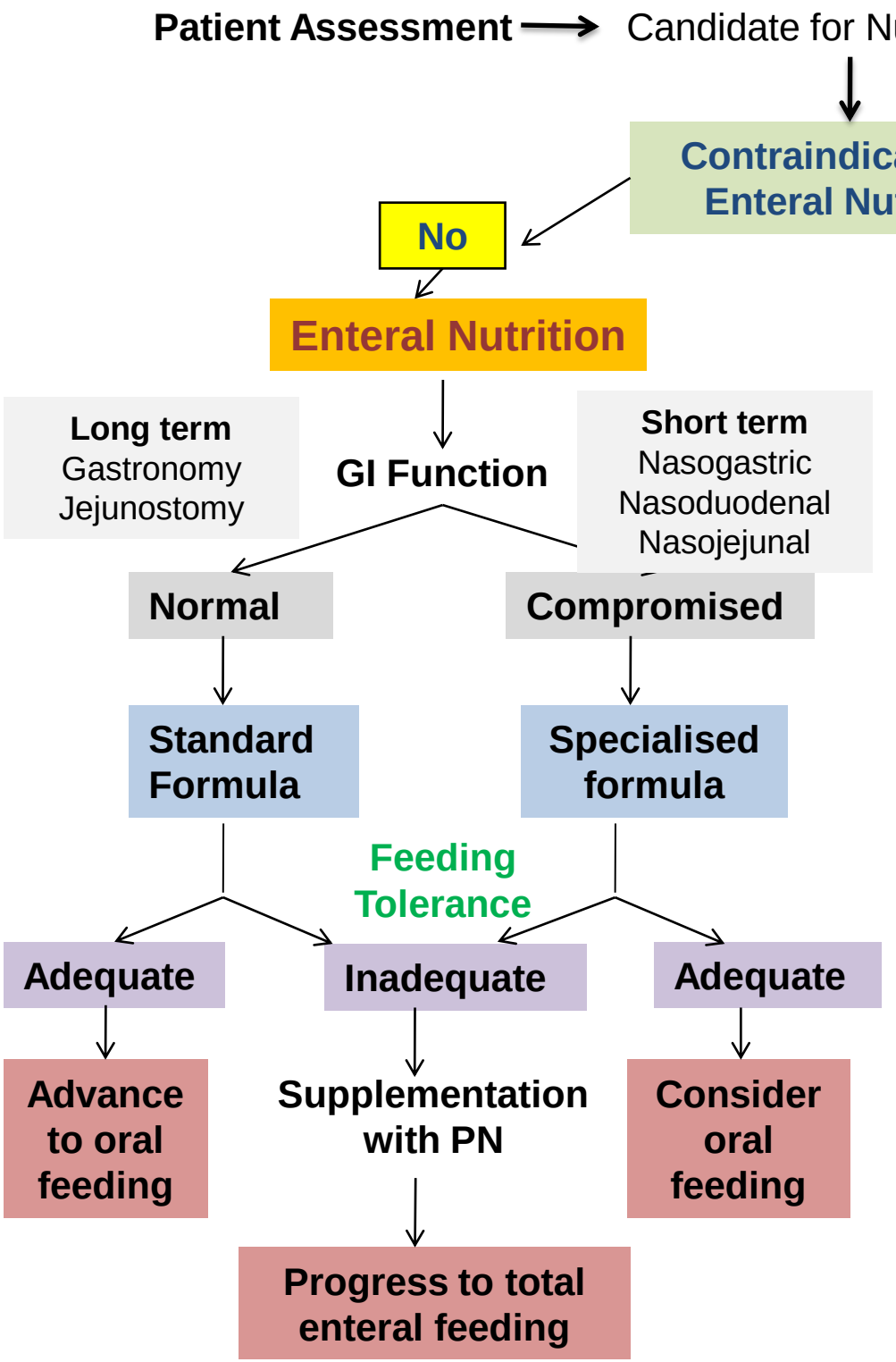
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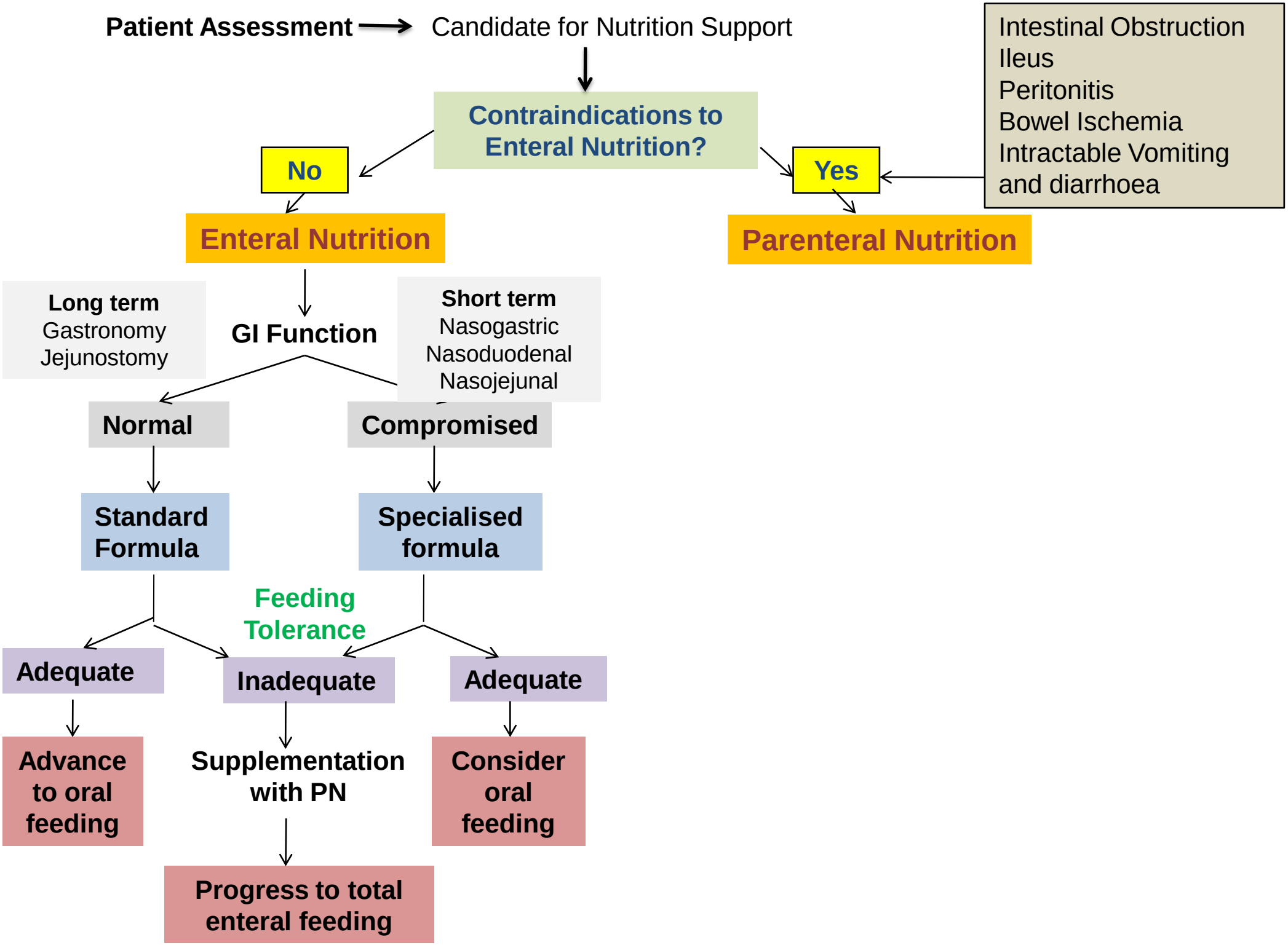
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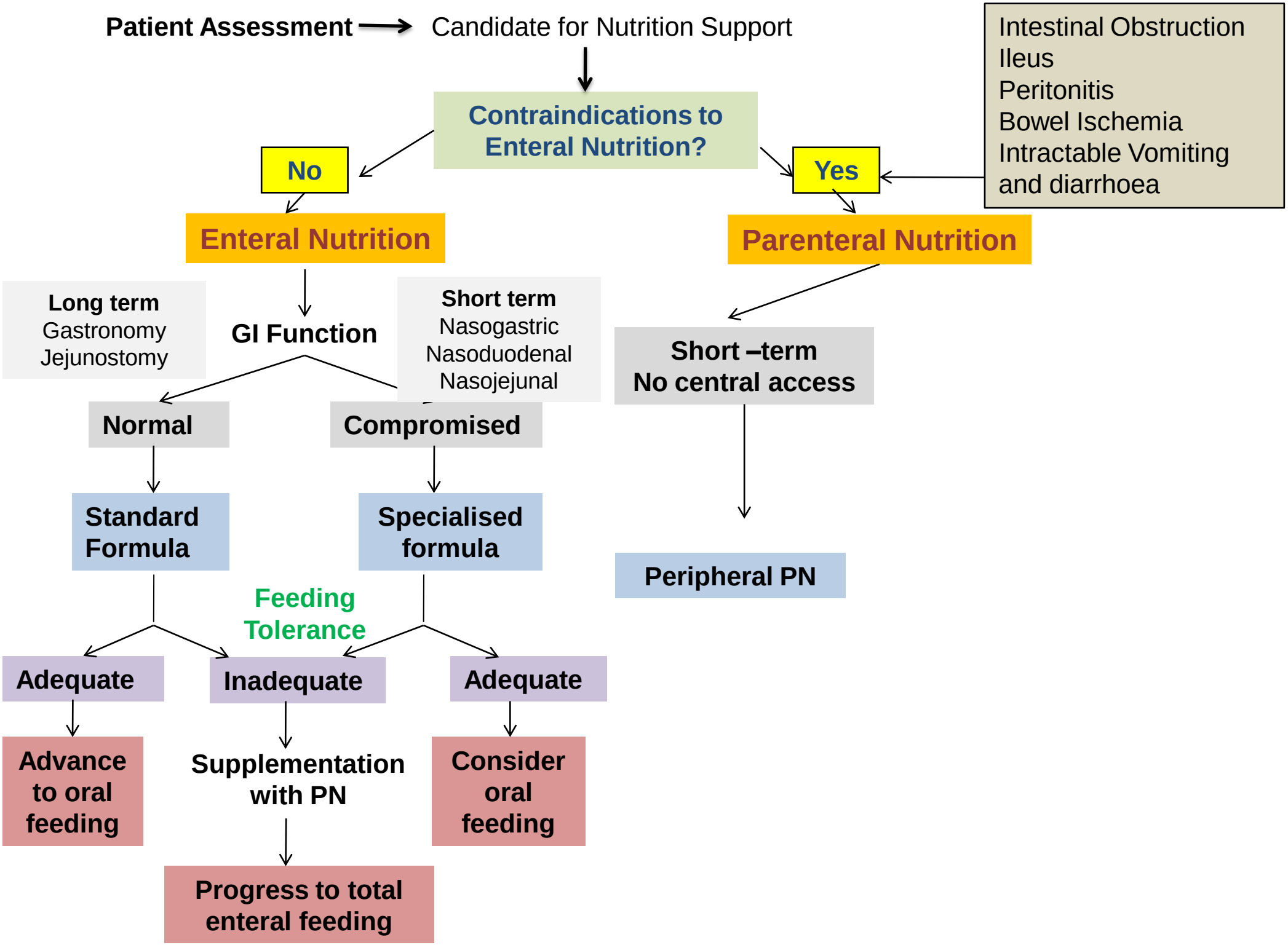
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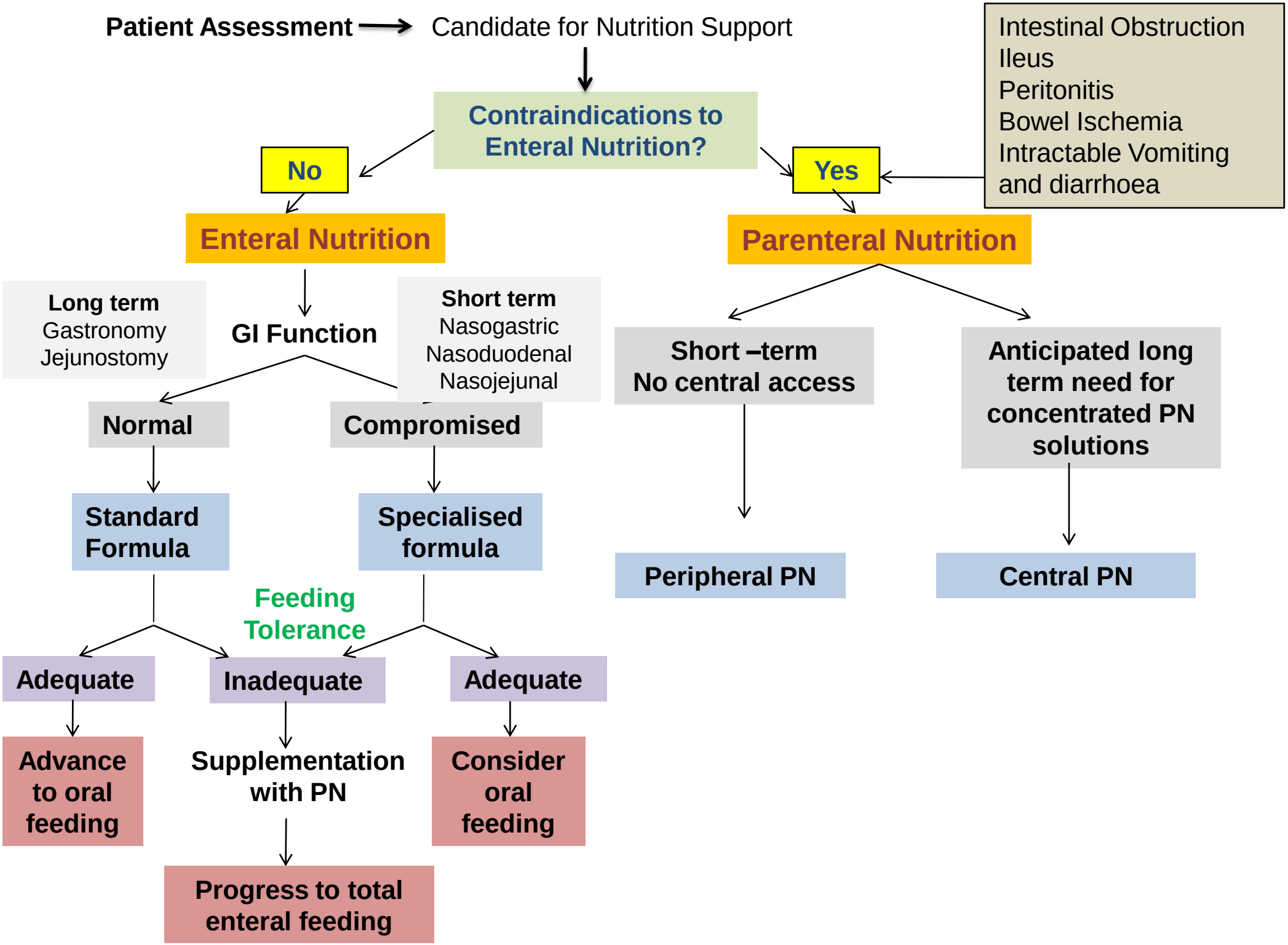
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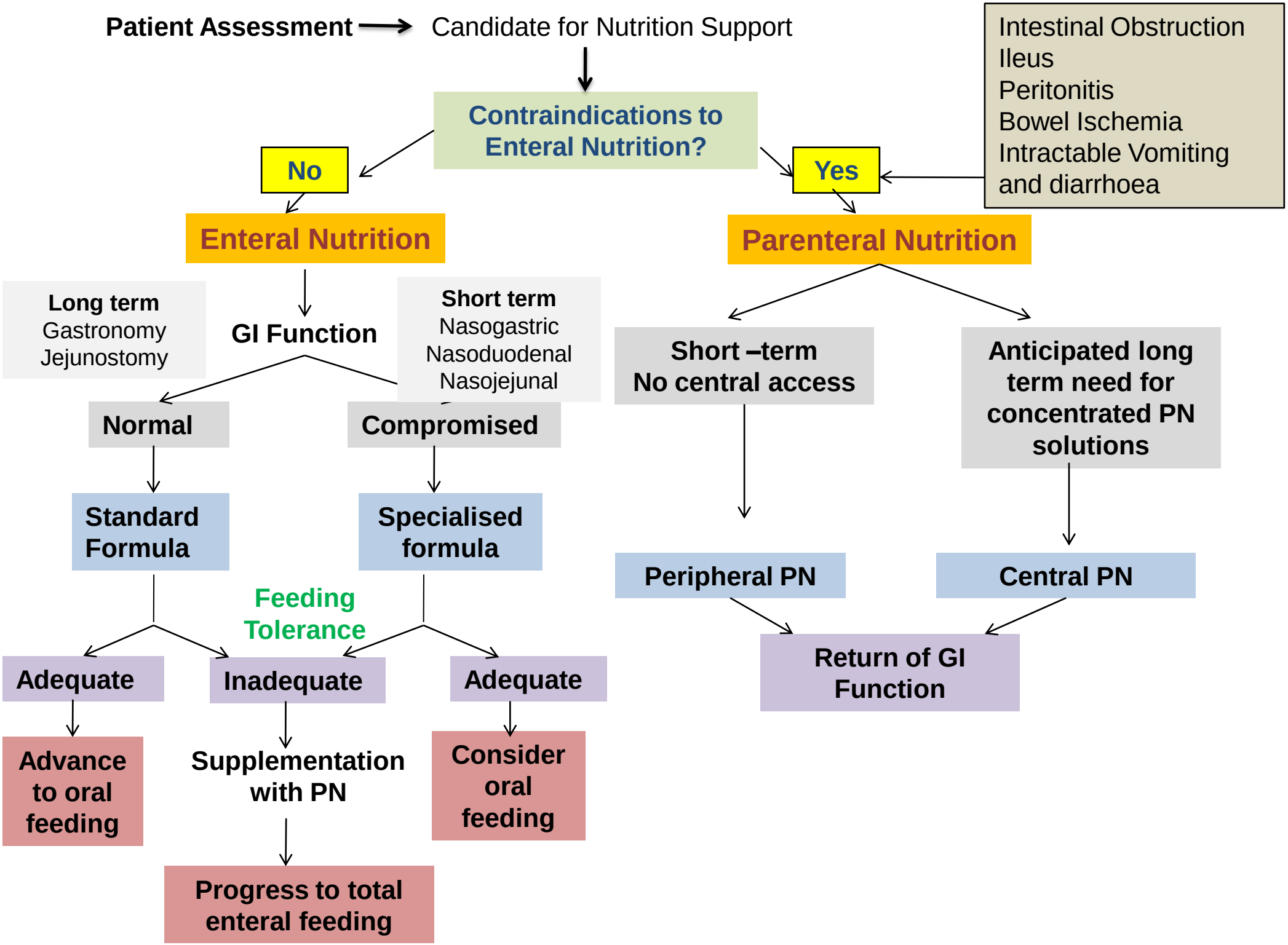
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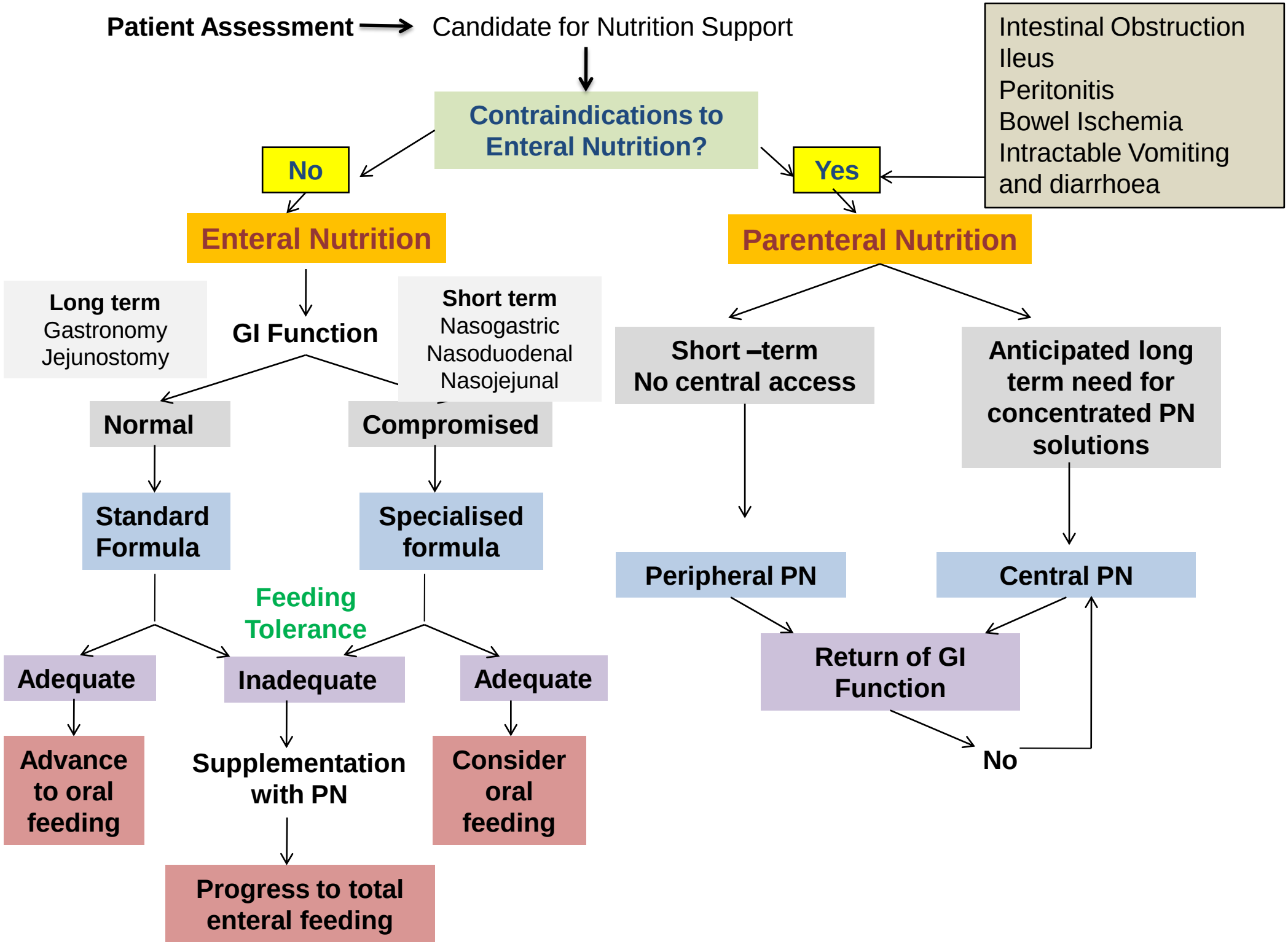
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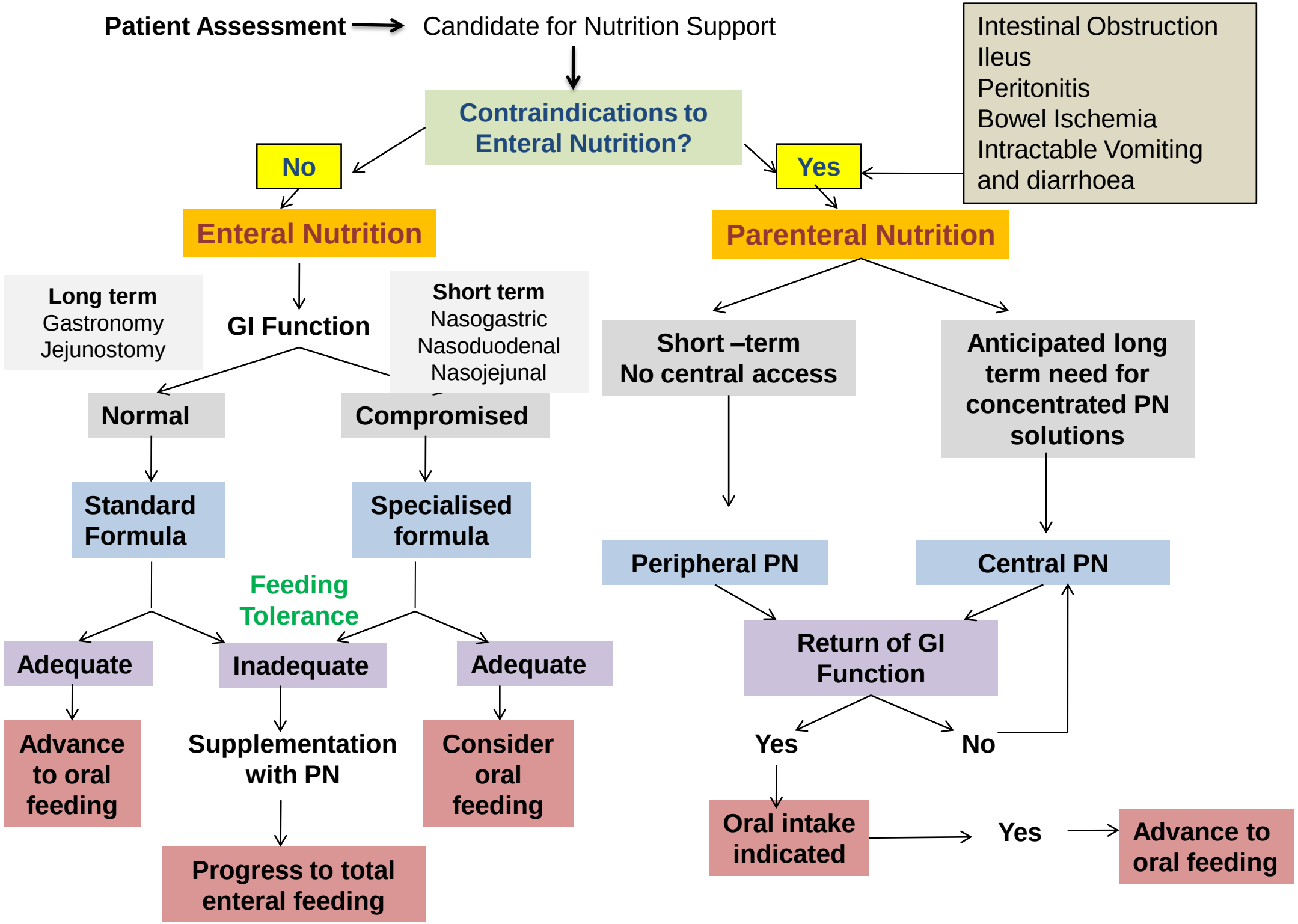
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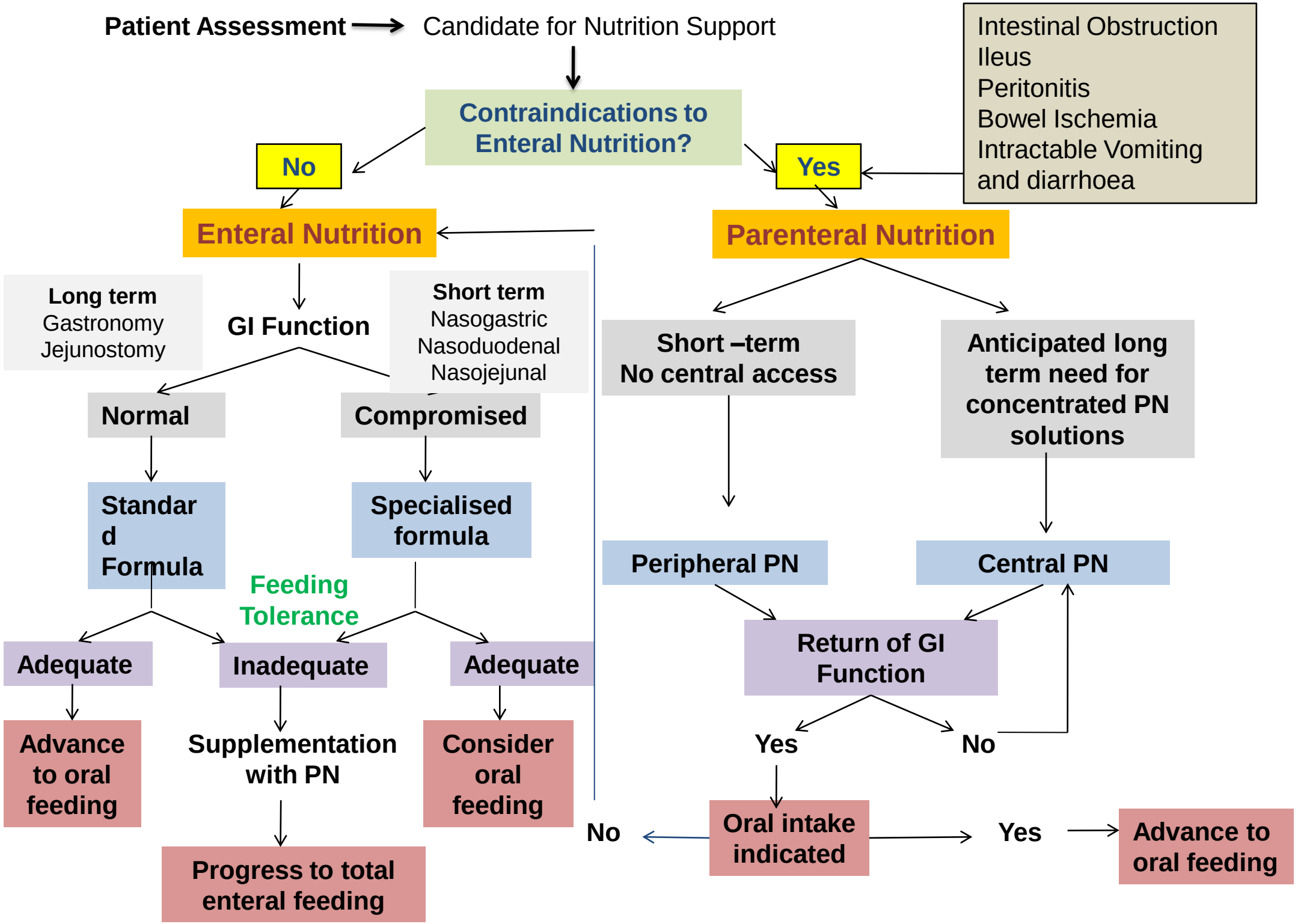
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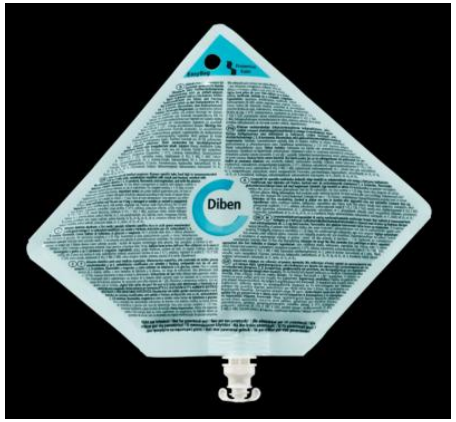
Tube feeds

Nutricia

Abbott

Fresenius

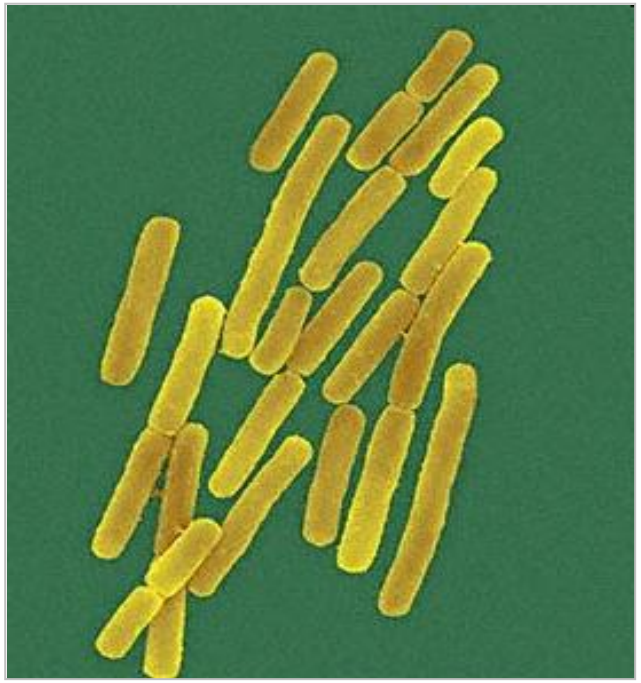


Feed	Indication
Standard +/- fibre	Non complicated enteral feed – 1.5-2 L/day
Higher energy density +/- fibre	Higher energy requirements, fluid restriction
Higher protein +/- fibre	Higher protein requirements
Elemental	Severe malabsorption / severe food allergies
Peptide	Malabsorption – less hyperosmolar than elemental
Renal	Low fluid, tailored vitamin and mineral profile
Diabetic	Low carbohydrate feed
ALI/ARDS	Higher fat, fish oil
Low sodium	For hypernatraemia when not due to dehydration
Immunonutrition	Conditionally essential AA, n3 FA etc www.criticalcarenutrition.com

Probiotics?

Antibiotic associated diarrhoea AAD

- Diarrhoea common side effect of broad spectrum antibiotics in hospitals/ nursing homes
- frequency 5-60%.
- *Clostridium difficile* implicated in 15-25% of AAD

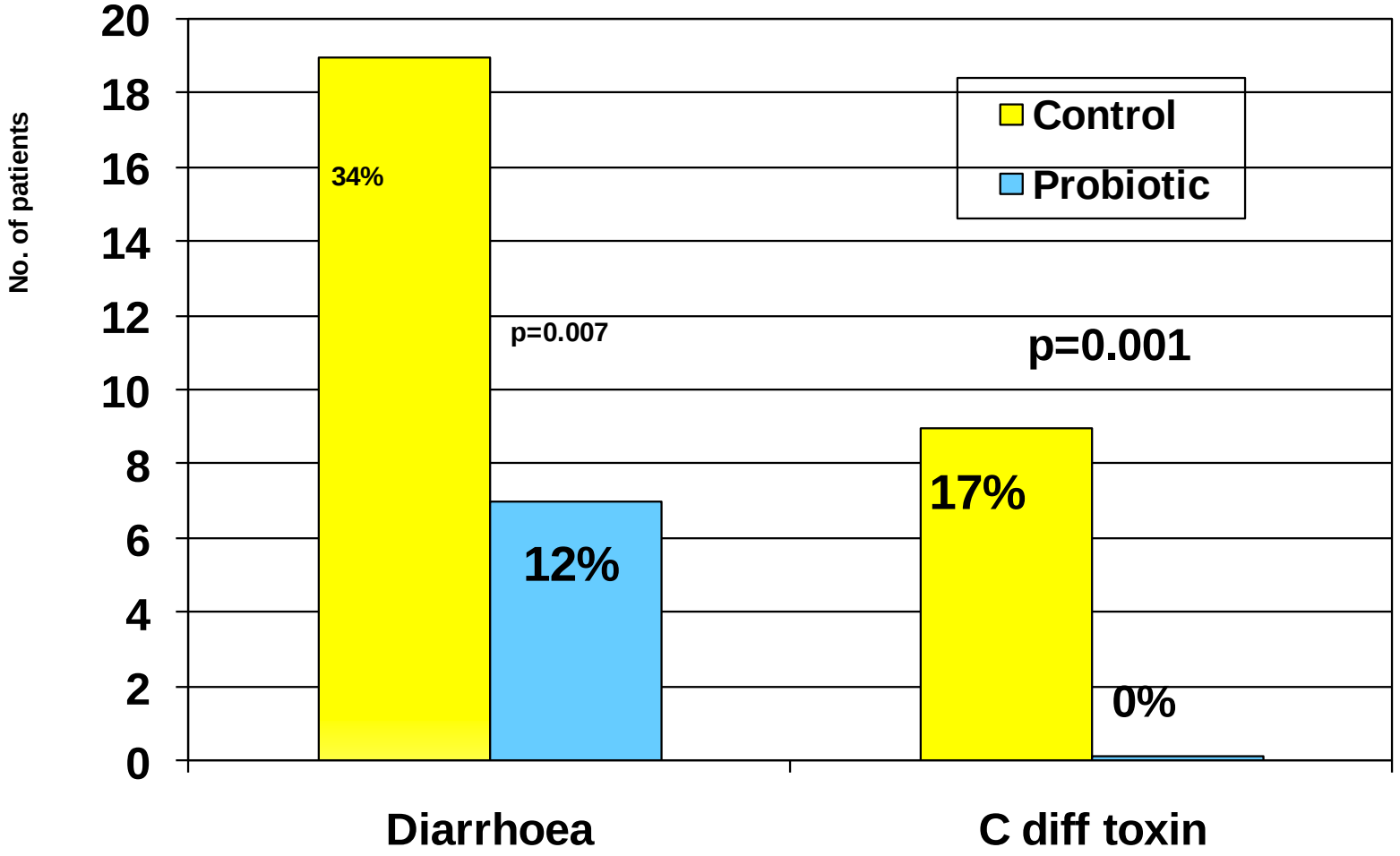


Probiotics & AAD

- 13/25 clinical trials→ sig reduction of AAD vs control (RR= 0.43, p ‹ 0.001)
- Most effective:
  - ***Saccharomyces boulardii*** (6 studies p<0.0001)
  - ***Lactobacillus rhamnosus GG*** (6 studies p<0.006)
  - **Mixed probiotics** (7 studies p<0.0001)
- Daily doses of > 10^{10} per day were associated with significant efficacy.
- Only S *boulardii* and *L casei* DN-114 001 were effective against *C. difficile*

McFarland LV. Am J Gastro 2006;101:812-22.

L casei (Actimel) & *C difficile*



Patients given L casei DN114001 2 x /d. during & 1 wk after antibiotics

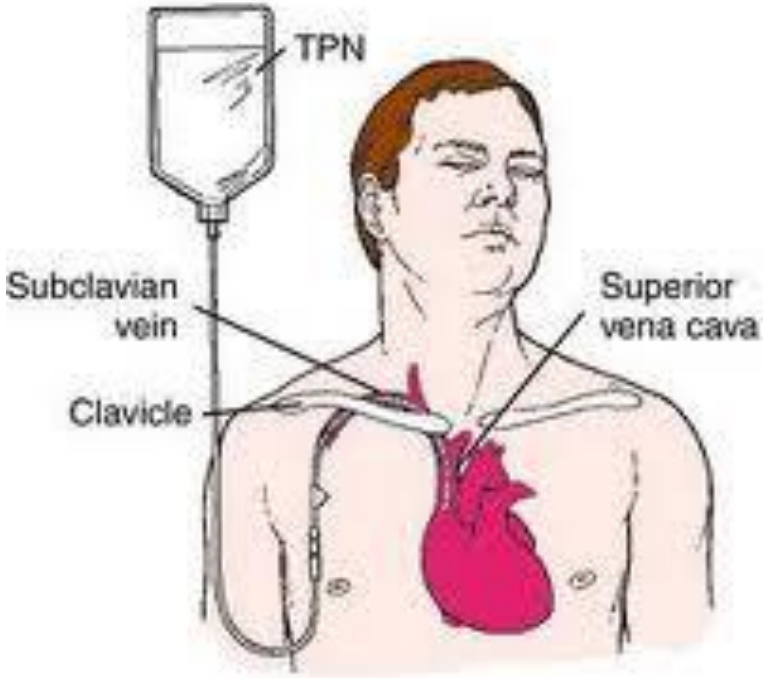
n=135 RDBPC study mean age 74 *Hickson M et al BMJ 2007; 335 : 80*

Other considerations in EN

- Confirmation of ng placement

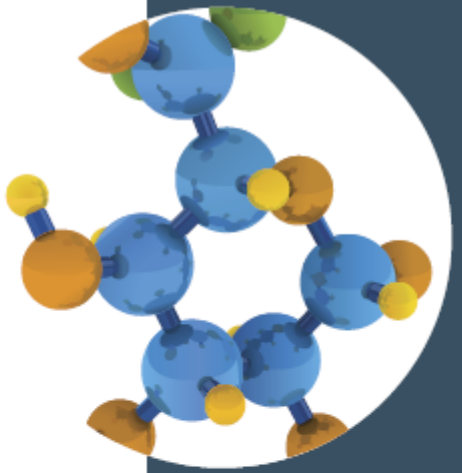
  National Patient Safety Agency Feb 05 www.npsa.org.uk
- Hanging times, closed system, feed contamination
- Full strength feeds
- Management of dehydration
- Blue dye – never to be used!

  http://www.fda.gov/ForIndustry/ColorAdditives/ColorAdditivesinSpecificProducts/InMedicalDevices/ucm142395.htm


TPN
Subclavian vein
Clavicle
Superior vena cava

A Mixed Bag

An enquiry into the care of hospital patients receiving parenteral nutrition



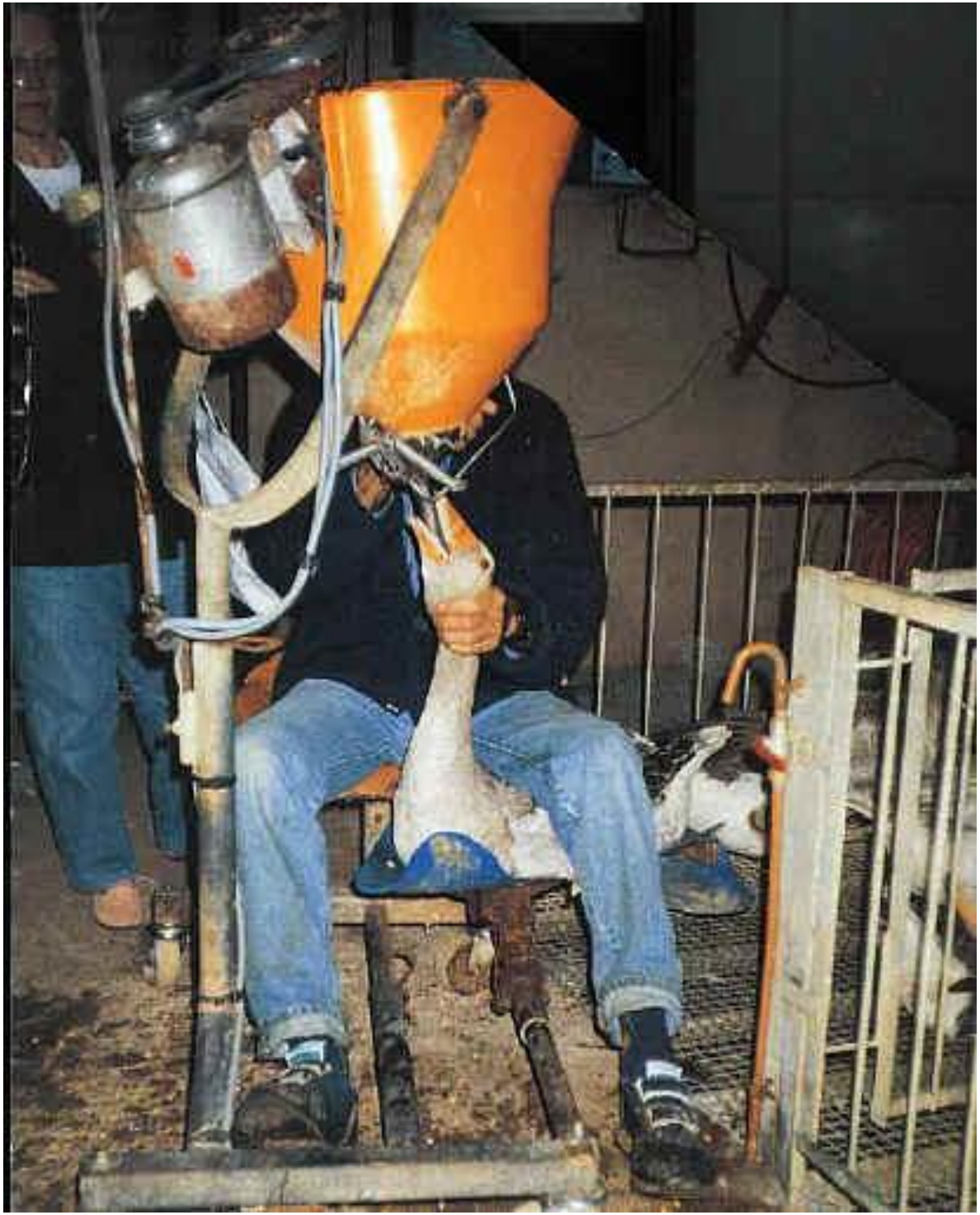
NCEPOD

Parenteral nutrition

- Amino acids
  - 1g nitrogen=6.25g protein
  - Conditionally essential amino acids
- Fat
  - LCT soyabean/safflower oil
  - 0.5-1.2g/kg/day
  - MCT, MUFA, structured lipids
- Carbohydrate
  - Glucose – hypertonic $\rightarrow$ hyperglycaemia, thrombophlebitis
  - Fructose, sorbitol, xylitol $\rightarrow$ lactate production
  - Modify infusion rates, special attention in critical illness

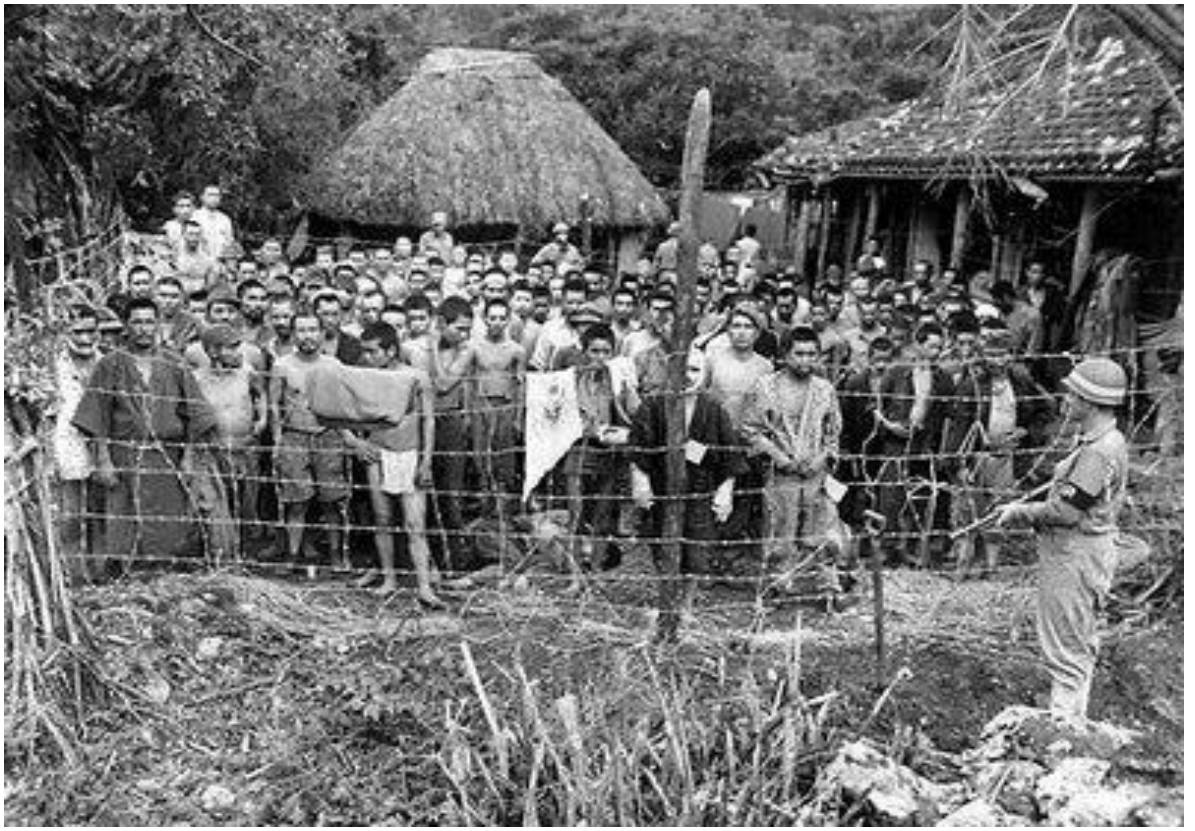
Other considerations in PN

- Concurrent feeding/weaning
- Vitamin and mineral administration
- Specific guidelines re: labelling, storing, infusion, light protection
- Max handling loads



Refeeding syndrome

Photo # 80-G-490447 Emaciated POW at Aomori, 29-30 Aug. '45



Schnitker MA, Mattman PE, Bliss TL. A clinical study of malnutrition in Japanese prisoners of war. Ann Intern Med 1951;35: 69-96.

In starvation

Insulin ↓ and glucagon ↑

Glycolysis and gluconeogenesis ↑ glucose

Lipolysis → FFA and ketone bodies

Fat and muscle catabolism:

- loss of LBM
- water
- PO_4, Mg, K

Serum phosphate levels may remain normal

During refeeding

Glucose → ↑ insulin

Metabolism of fat → metabolism of carbohydrate

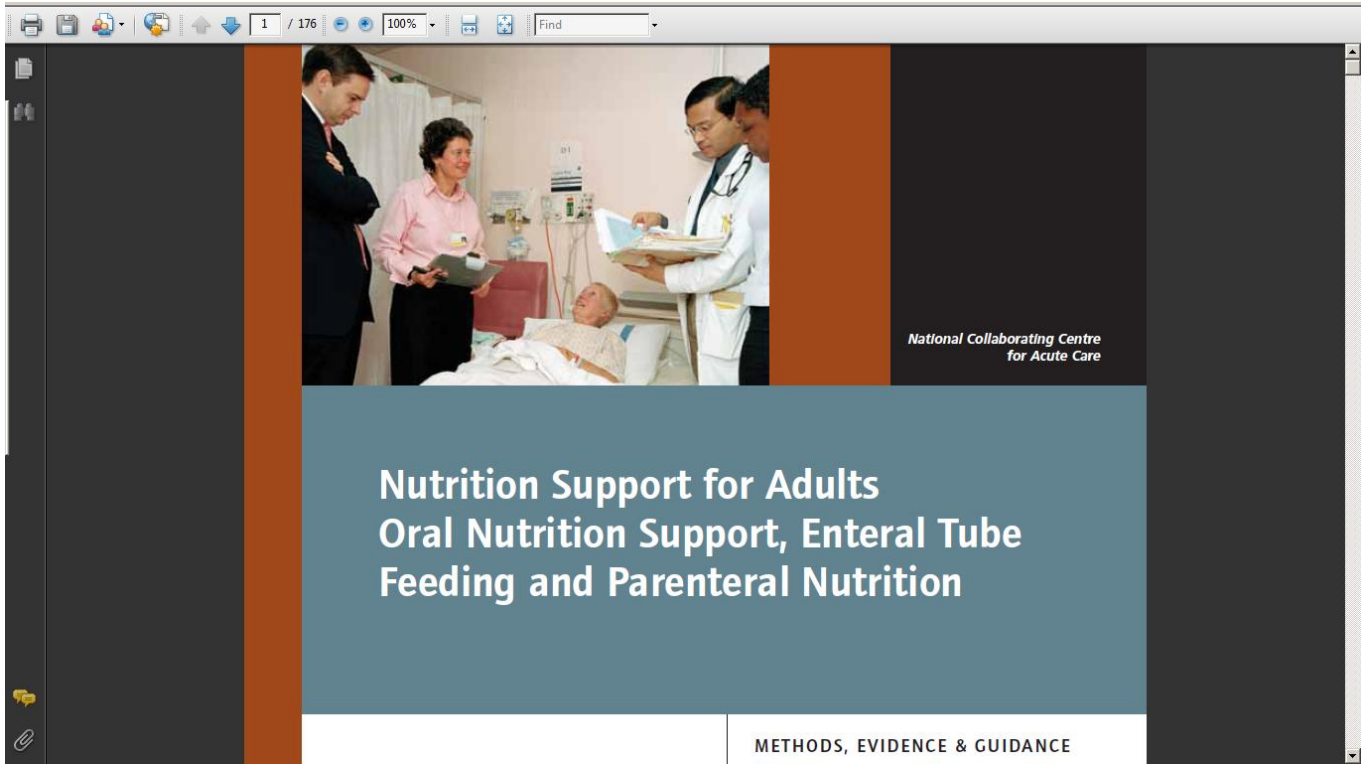
Insulin → move into cells of

glucose, PO_4, Mg, K, and thiamin for anabolism

Leads to significant shifts in electrolytes and fluid.

Potential cardiac, resp, hepatic, renal, GI, neuromuscular and haematological consequences.

Recommendations



http://guidance.nice.org.uk/CG32

Refeeding syndrome:A literature review. Khan LUR, Ahmed J, Khan S and McFie J. Gastroenterology Research and Practice 2011 (in press)

High risk of refeeding problems

•**One or more of the following:**

- BMI less than 16 kg/m
- unintentional weight loss greater than 15% within the last 3-6 months
- little or no nutritional intake for more than 10 days
- low levels of potassium, phosphate or magnesium prior to feeding

•**Two or more of the following:**

- BMI less than 18.5 kg/m
- unintentional weight loss greater than 10% within the last 3-6 months
- little or no nutritional intake for more than 5 days
- a history of alcohol abuse or drugs including insulin, chemotherapy, antacids or diuretics

High risk of refeeding problems

- Consider:
- starting nutrition support at 10 kcal/kg/day max
- increasing levels slowly
- restoring circulatory volume and monitoring fluid balance and clinical status
- providing thiamin and multivitamin/trace element supplement
- providing extra potassium, phosphate and magnesium

Refeeding

- 25-35% of at risk populations
- Often under recognised and not treated
- Early identification
- Incidence in ireland

Protocols

- Insertion of nasogastric tube
- Confirmation of placement of ng tube
- Enteral feeding protocol general ward
- Enteral feeding protocol ICU
- Post pyloric feeding protocol
- Post PEG protocol
- Parenteral nutrition protocol
- Weaning protocol from PN to EN

www.ispen.ie

Advancing standards *of* Nutrition Care

Disease-related malnutrition affects about 140,000 people in Ireland and costs at least €1.5 billion per year.

Founded with the support of the **Irish Society of Gastroenterology (ISG)**, the **Irish Nutrition and Dietetic Institute (INDI) and the Irish Section of the Nutrition Society,** ISPEN is a society consisting of clinicians, dietitians, nutritionists and other health professionals from clinical practice, research and education. Together our aim is to combat malnutrition by optimising the nutritional management of patients in hospital and the community.

JOIN US!

Free Membership

Register on our site and get free membership of ISPEN until the end of 2010.

Courses *and* Events

National and international courses and conferences in areas of nutrition support.

Join ISPEN

Get involved with ISPEN, discover what we have planned and see if you can help!

Latest News

'20 million people in EU with malnutrition' EU Parliament told
November 10, 2010

Increased incidence of Malnutrition
November 8, 2010

Latest Publication

A Picture of Ageing Research: Ireland, North and South
November 24, 2010


"That's all Folks!"