

WHEN To Initiate Parenteral Nutrition A Frequent Question With New Answers

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Disclosures

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Learning Outcomes

1. Specify clinical factors that should be utilized when assessing appropriate candidates for PN.
2. Detail practical approaches for the appropriate use of PN in a variety of clinical situations and patient complexities.

Background

- Parenteral nutrition (PN) represents one of the most notable achievements of modern medicine.
- PN can serve as a therapeutic modality for all age groups across the healthcare continuum.
- PN offers a life-sustaining option when intestinal failure prevents adequate oral or enteral nutrition.
- Providing nutrients by vein is an expensive form of nutrition support, and serious adverse events can occur.

ASPEN Consensus Recommendations

Consensus Recommendation



When Is Parenteral Nutrition Appropriate?

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Challenges for Identifying Evidence-Based Indications PN Therapy

Strength of the Evidence



Challenges Encountered

- Much of the data are “old”.
- Data have been generalized based on narrowly selected cohorts
- Results may reflect outdated clinical practices (glycemic control, overfeeding, care of central line)
- Little data with newer products.
- Well-designed RCTs are scarce.
- Insufficient regarding competency and outcomes

Consensus Recommendations

- Developed in the absence of high-quality, grade level evidence
- Designed to provide guidance in clinical decisions
 - Identify best practices
 - Reduce variations in practice
 - Enhance patient safety
 - Provide day-to-day guidance for clinical decisions; minimize risks
- Not intended to supersede the judgment of the healthcare professional

Identifying Candidates for PN

1. Is PN ever the routinely indicated for a specific medical diagnosis or disease state?
2. Is PN ever the preferred route for nutrition?
3. What clinical factors determine feasibility of enteral nutrition (EN)?
4. When EN is not feasible, what is a reasonable time frame for initiating PN?

Scenario: Recognizing Indications for PN

- 57 year old patient transferred after 7 days in an outside hospital with severe gallstone pancreatitis
- Patient has 2 large infected collections compressing stomach
- Unable to place enteral access
- Patient was started on PN 3 days prior to transfer
- IR placed drains to manage collections



Moving Away from Medical Diagnoses

- PN was considered standard of care for pancreatitis
- Enteral nutrition is primary nutrition therapy
- Focus on clinical factors to determine need for PN
- Evaluation of enteral readiness should be ongoing
- Baseline nutritional status
- Metabolic status
- End of life considerations
- In some cases both PN and EN become necessary
 - Either together or sequentially along continuum



LEADING THE SCIENCE AND
PRACTICE OF CLINICAL NUTRITION

Worthington, P. et al., JPEN 2017; McClave et al. JPEN 2016

Indications for PN: The Impact of Clinical Factors

Non-functional GI tract (Failed / inadequate enteral feeding)

- Impaired absorption of nutrients
 - short bowel syndrome, fistula, absorptive capacity
- Mechanical bowel obstruction
 - Peritoneal carcinomatosis, severe adhesive disease
- Motility disorders
 - pseudo-obstruction, prolonged ileus
- Need for “bowel rest”
 - ischemic bowel, neutropenic colitis, chylous fistula, severe pancreatitis
- Inability to achieve enteral access

“Bowel Rest” as an Indication for PN

Ischemic Bowel	Mesenteric artery stenosis; intestinal angina, abdominal compartment syndrome, or low flow states.
Severe Pancreatitis	Increased pain or serum lipase levels with enteral nutrition; infected pancreatic phlegmon or pseudocyst, complex pancreatic fistula, abdominal compartment syndrome.
Chylous fistula	Increased output with low fat diet or elemental formula
Preoperative status	Severely malnourished adults with non-functional gastrointestinal tract for 7-10 day prior to surgery

Clinical Course

- Delayed gastric emptying
- Post-pyloric feeding tube successfully placed
- Some diarrhea, non-infectious
- Adjustments to EN regimen improves tolerance over 5 days
- Day 6: CT shows communication between duodenum and collection
- PN was continued and EN stopped



Feasibility of EN

- Functional status of GI tract
 - Diagnostic studies, clinical exam
- Failed EN trials
- Failure to achieve/ maintain enteral access
- Contraindications to enteral access
 - Active GI Bleeding
 - Uncontrolled peritonitis
 - Ischemic bowel
- Tolerance of EN
 - Intractable diarrhea despite interventions

Time Frame for Beginning PN

- Initiate PN after 7 days for well-nourished, stable adult patients who have been unable to receive significant oral or enteral nutrients.
 - Significant: 50% or more of estimated requirements
- Initiate PN within 3 to 5 days in those who are nutritionally at-risk and unlikely to achieve desired oral intake or EN.
- Initiate PN as soon as is feasible for patients with baseline moderate or severe malnutrition in whom oral intake or EN is not possible or insufficient.

Scenario: Perioperative PN

- A 62 yr male admitted with a diagnosis of gastric cancer.
- Increased dysphagia over past month leading to decreased oral intake.
- Weight loss of 15# over past month (8%)
- Endoscopy-gastric tumor at the gastric-esophageal junction
- Admitted for surgical intervention.
- Admitting nutrition screen: MST of 5
- RD nutrition assessment: severe malnutrition related to chronic illness.
 - Physical exam – evidence of temporal, clavicular and scapular muscle loss

Question: What is The Role of Perioperative PN in Patients Undergoing Elective/Non urgent Surgery

- Surgical focus: “optimization of nutrition”
- Preoperatively:
 - Consider preoperative PN in severely malnourished patients unable to tolerate oral intake or EN—7 days for benefit
- Postoperatively:
 - Reserve PN for severely malnourished patients unable to tolerate adequate oral intake or EN for more than 7 days (unless initiated preoperatively)

Preoperative Nutrition Support in At Risk Abdominal Surgery Patients

- Prospective cohort study
 - To evaluate the impact of nutrition support on clinical outcome in patients at nutritional risk
- NRS ≥ 3 = 47.2% (512 of 1085)

NRS Score	Pre-Op NS – Hosp A	Pre-Op NS – Hosp B
< 3	0%	0%
3-4	5.6%	5.2%
5-6	41.5%	32.9%

- 56.6% of risk patients received NS
 - PN = 334, EN = 73, PN-EN = 61

Preoperative Nutrition Support in At Risk Abdominal Surgery Patients

Overall Complications With NRS Of At Least 5

	Preop NS	Control	P Value
Overall Complication	25.6%	50.6%	0.008
Infectious Complication	16.3%	33.8%	0.004
Non-Infect Complication	18.6%	36.4%	0.042

Number Of Complications With NRS Of At Least 5

	Preop NS	Control	P Value
No Complications	32 (74.4)	38 (49.3)	0.008
One Complication	6 (14.0%)	18 (23.4%)	
Two complications	3 (7.0%)	12 (15.6%)	0.046
≥ 3 Complications	2 (4.6%)	9 (11.7%)	

Jie B. et al,
Nutrition 2012, e
pub

Scenario: Weaning PN to Oral Nutrition

- 77 yr female with complicated hospital course including sepsis and bowel obstruction is receiving PN following recent surgical intervention.
- Required ventilatory support post operatively.
- Diagnosed with severe malnutrition related to acute illness.
- Gastrointestinal function is returning and an oral diet has been started.
- Oral meal intake is variable ranging from 25% to 50%.
- The physician orders weaning and discontinuation of PN.
- **Should this patient's PN be weaned?**

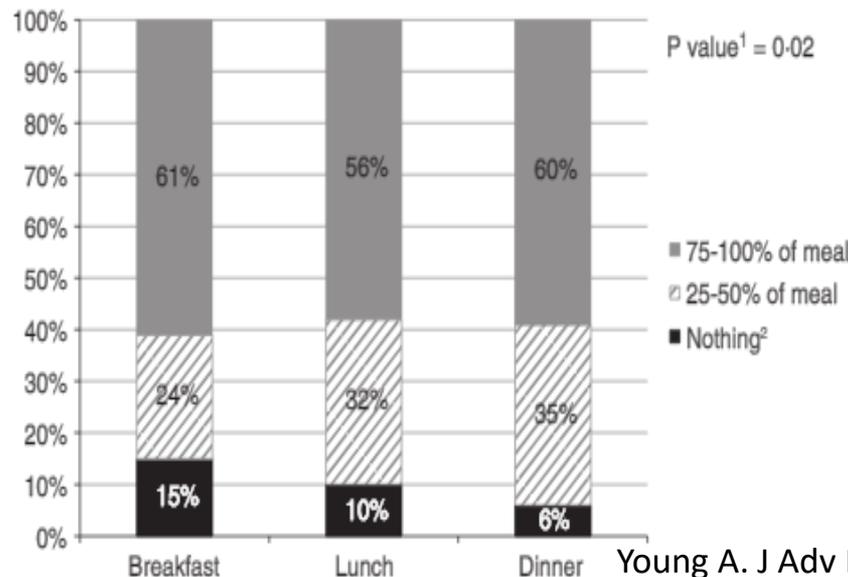
PN Weaning to Oral Nutrition

Wean PN when oral intake and/or EN achieves 50%–75% of requirements for energy, protein, and micronutrients,

- This process can be quite rapid in some patients.
- PN can be withdrawn in a very short period without significant modification.
- Difficult to achieve this level of intake in those patients with a prolonged hospital course and/or malnourished.
- May require longer weaning periods and should demonstrate higher oral intakes than those not malnourished

Food Intake Can Be Improved

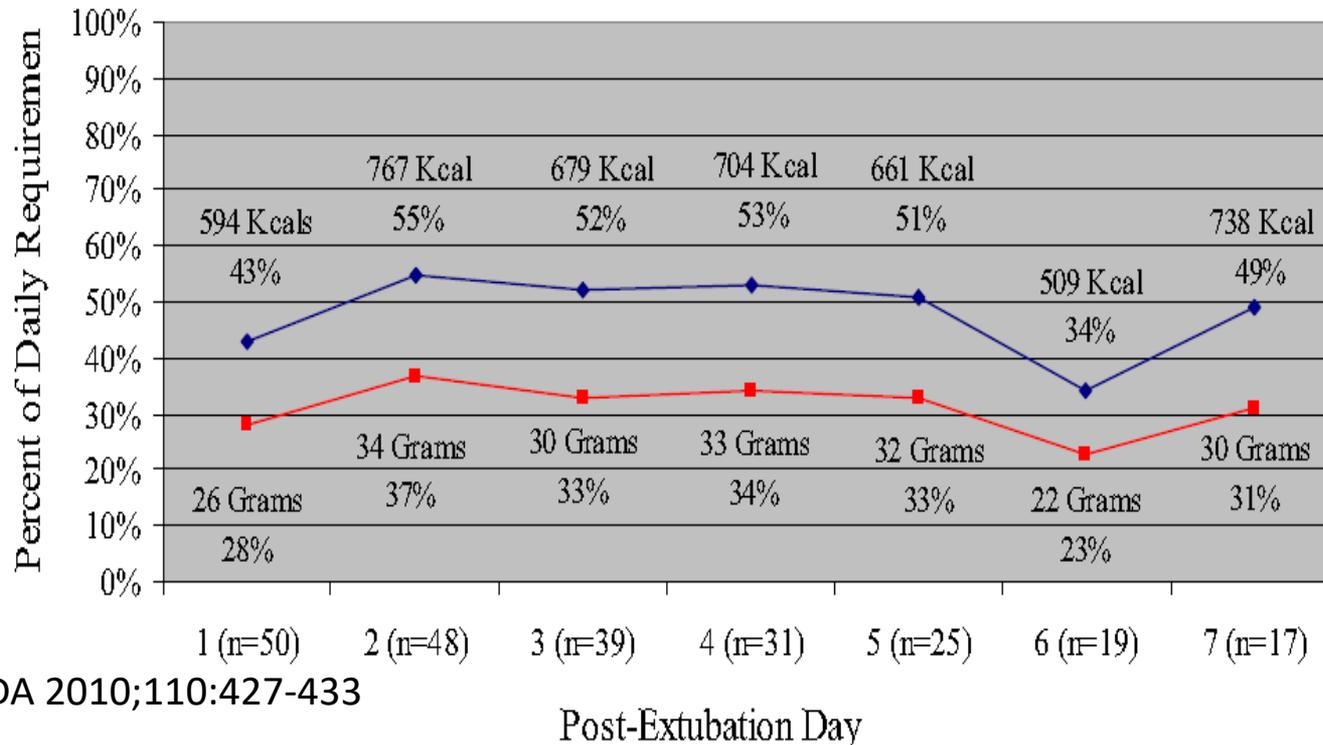
- To evaluate the impact of mealtime practices on meal intake
- Oncology, vascular, internal medicine and orthopedic patient care units
- Mealtime audits of 6 meals/unit for 2 weeks



“This study confirmed that hospital patients eat poorly; 40% of patients ate half or less of their meal, with 10% eating none of the meal provided.”

Oral Intake Often Inadequate

- Observational review of ICU patients – oral intake post extubation
- 44% malnourished on ICU admission
- Barriers to intake included anorexia, N/V, restrictive diets, weakness



Strategies to Reduce Clinical Complications

- Employ standardized processes for managing PN
 - Procedure-driven protocols
 - Avoid variations in practice
- Policies and procedures in place to reduce the risk of complications
 - Promote glycemic control
 - Avoid overfeeding
 - Meticulous management of venous access devices
- Use an interprofessional team with expertise in PN
- PN prescribers must demonstrate prescribing competencies

To Summarize

- PN is a high-alert medication that requires clearly articulated policies and procedures.
- Goal: Promote clinical benefits while minimizing the risks associated with therapy.
- Recognize clinical indications for PN.
- Judicious selection of candidates is essential.
- Develop PN prescriptions that meet individual needs.
- Monitor the response to therapy.

THANK YOU!!

Questions??