Pocket Guide to Enteral Nutrition

THIRD EDITION

Dietitians in Nutrition Support Dietetic Practice Group

EDITOR

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Frequently Used Terms/Abbreviations

ASPEN	American Society for Parenteral and Enteral Nutrition
AANH	Artificially administered nutrition and hydration
AKI	Acute kidney injury
ALI	Acute lung injury
ARDS	Acute respiratory distress syndrome
ASPEN	American Society for Parenteral and Enteral Nutrition
BTF	Blenderized tube feeding
BUN	Blood urea nitrogen
COPD	Chronic obstructive pulmonary disease
CRRT	Continuous renal replacement therapy
DME	Durable medical equipment
DNS	Dietitians in Nutrition Support
DPEJ	Direct percutaneous endoscopic jejunostomy
EAD	Enteral access device
EN	Enteral nutrition
ESGE	European Society of Gastrointestinal Endoscopy
FDA	Food and Drug Association
GRV	Gastric residual volume
HCPCS	Healthcare Common Procedure Coding System
HEN	Home enteral nutrition
ICU	Intensive care unit
IEF	Immune-enhancing formulas

LCHF	Low-carbohydrate, high-fat
NCP	Nutrition Care Process
NCPT	NCP terminology
ND	Nutrient Delivery
NOBN	Non-occlusive bowel necrosis
NOMI	Non-occlusive mesenteric ischemia
NPO	Nil per os
OGT	Orogastric tube
PEG	Percutaneous endoscopic gastrostomy
RDN	Registered dietitian nutritionist
RS	Refeeding syndrome
SCCM	Society of Critical Care Medicine
SCFA	Short-chain fatty acids
SIADH	Secretion of antidiuretic hormone
SOP	Scope of Practice
VA	Veterans Affairs
VDE	Vasopressor dose equivalence

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Britta Brown, MS, RD, LD, CNSC, editor

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Patient Selection and Indications for Enteral Nutrition

Britta Brown, MS, RD, LD, CNSC

Introduction

Enteral nutrition (EN), the provision of a liquid solution of nutrients by feeding tube into the stomach or small intestine, is recommended for patients who cannot meet their nutritional needs through oral intake. This chapter focuses on identifying patients who require EN and provides information that registered dietitian nutritionists (RDNs) need when completing the first three steps of the Nutrition Care Process (NCP): nutrition assessment, nutrition diagnosis, and nutrition intervention.[1]

The Nutrition Care Process

Nutrition Assessment and Patient Selection

Nutrition assessment is the first step of the NCP, and completing a comprehensive nutrition assessment is essential to determine whether EN is appropriate for a patient. Use of standardized NCP terminology (NCPT) to document nutrition assessment findings supports quality care by preventing errors caused by misunderstanding and miscommunication.[2]

Nutrition support dietitians can use NCPT assessment terms for the following purposes:

- To evaluate the patient's ability to meet nutrient needs through oral intake.
- To describe physical signs indicative of malnutrition or specific nutrient deficiencies.
- To evaluate changes in anthropometric measurements.
- To identify risk factors based on family history.
- To prevent potential interactions between enteral formulas and medications.

A subscription to the eNCPT online database, which includes resources for nutrition assessment of patients who are candidates for or who are already receiving EN, can be purchased through the Academy of Nutrition and Dietetics.[3]

An important component of the nutrition assessment is evaluation of the patient's ability to meet nutritional needs through an oral diet. A variety of tools are available to estimate oral intake, including 24-hour recall, patient observation, food-frequency questionnaires, diet histories, food waste studies, and novel computer tools.[4,5]

EXPERT INSIGHT

Note that each of the nutrition assessment methods or tools is associated with limitations, such as recall bias, which the clinician should take into consideration.

When conducting a patient nutritional assessment, keep in mind that it is not known how long patients who are hospitalized can maintain their clinical and functional status without adequate nutritional intake. Studies have found that nutritional deficits can become evident in hospitalized patients who are otherwise healthy and non-stressed after 2 weeks on a low-calorie diet.[6] In addition, many patients who are hospitalized are hypermetabolic and placed nil per os (NPO) for extended periods of time. For patients in the intensive care unit (ICU), the decision to initiate EN should be made within the first 24 to 48 hours of admission and EN should be advanced to achieve the goal rate over the next 48 to 72 hours.[7] Among patients considered at high nutrition risk (defined as a severe medical

condition that may lead to significant morbidity due to malnutrition) or who are already malnourished, EN initiation should also be considered within the first 48 hours of admission.[8] EN is generally recommended for patients who are at low nutrition risk or who are adequately nourished if they are not expected to consume adequate oral nutrition for more than 5 to 7 days.[9,10]

EXPERT INSIGHT

Improved clinical outcomes have been documented in patients who are malnourished and receive EN. However, EN still appears to be an underutilized therapy in patients who are malnourished who could benefit from this intervention.[8-10]

A comprehensive nutrition assessment includes evaluation of the patient's clinical status, planned medical and/or surgical therapies, gastrointestinal (GI) function, goals, and overall plan of care. Evaluation of clinical status includes assessment of the following:

- Organ function (eg, renal, liver, cardiac)
- Hydration status
- Fluid and electrolyte levels
- Glycemic control
- Nutrition-focused physical examination
- GI function
- Medical history
- Surgical history

Adequate GI function is typically characterized by clinical examination findings that include a soft, nondistended abdomen and passage of stool. Although the presence of bowel sounds is often used as an indicator of GI function, the absence of bowel sounds does not preclude enteral feeding. Additional information regarding the integrity of the GI tract may be provided through the results of radiologic reports (eg, MRI, CT scan, abdominal x-ray, etc.) and GI studies, such as endoscopy or colonoscopy.

Nutrition Diagnosis

EN should be initiated in response to the nutritional implications associated with a given medical diagnosis rather than to the medical diagnosis alone. For example, while many patients with oropharyngeal cancers require EN, some do not. The decision to initiate EN is therefore made by evaluating findings from the individual patient's nutrition assessment. In this example, RDNs must consider oropharyngeal cancer as part of the patient's history along with anthropometric measurements, current and past food and nutrient intake, medications, and other treatments, and then make at least one nutrition diagnosis. The implications of the medical diagnosis may or may not then inform the decision to initiate EN.

Clinicians caring for patients who require EN are likely to use NCPT terms from the Intake (NI) domain, such as energy balance (NI-1), oral or nutrition support intake (NI-2), or fluid intake (NI-3). Single or multiple nutrient (NI-5) nutrition diagnoses may also be used, although this is less common. Depending on the clinical scenario, nutrition diagnoses from the Clinical (NC) domain, including altered GI function (NC-1.4), impaired nutrient utilization (NC-2.1), or altered nutrition-related laboratory values (NC-2.2), may also be used for patients receiving EN, but these nutrition diagnoses are often made in conjunction with a nutrition diagnosis from the Intake domain.[3]

Nutrition Intervention

Following the nutrition assessment and nutrition diagnosis steps, the RDN must then determine the most appropriate nutrition intervention for a particular patient; this step involves both planning and implementation. When the RDN determines that oral intake is insufficient to meet estimated nutrient needs, the appropriate NCPT term is selected to describe the appropriate interventions (eg, enteral nutrition) from the Food and/or Nutrient Delivery (ND) domain.[3] The NCPT includes several nutrition intervention terms that may be appropriate to describe actions taken by RDNs who are responsible for patients receiving EN.

Other types of interventions may also be appropriate for patients who are receiving EN, and RDNs must be aware of the need to coordinate care. Care team meetings are listed in the NCPT under Coordination of Nutrition Care by a Nutrition Professional (RC) domain. RDNs may also be involved in managing medications, providing nutrition education, and providing feeding assistance during transitional feedings. Each of these nutrition interventions should be documented as appropriate for the specific patient.

EXPERT INSIGHT

To clearly describe the work of the RDN, every nutrition intervention should be associated with a nutrition diagnosis.[3] For example, if nutrition education is provided, there should be a nutrition diagnosis for which education is the best available treatment.

Potential Benefits of Enteral Nutrition

EN can safely be provided in any care setting, from hospitals to long-term care facilities to in the patient's home. EN is the preferred route of nutrition support for individuals with sufficient GI function to absorb enterally provided nutrients.[7] The possible benefits of EN are listed in Box 1.1.[11-13]

BOX 1.1 Potential Benefits of Enteral Nutrition[11-13]

- Preservation of gut barrier function
- Preservation of gastrointestinal mucosal integrity
- Preservation of mucosal immunologic functions, including gut associated lymphoid tissue (GALT)
- Attenuation of the catabolic response
- Improved wound healing
- Maintenance of digestive and absorptive capabilities of the gastrointestinal tract
- Augmentation of cellular antioxidant systems
- More cost-effective than parenteral nutrition

Indications and Contraindications for Enteral Nutrition

As part of a thorough nutrition assessment, RDNs must consider the potential indications and contraindications for EN prior to developing a nutrition care plan that includes this treatment modality. Many patients

have functional GI tracts and can be suitable candidates for EN. However, a smaller subset of patients may not have functional GI tracts, in which case EN should be avoided. Box 1.2 outlines general indications and contraindications for EN.[13-15]

BOX 1.2 Indications and Contraindications for Enteral Nutrition[13-15]

Indications

Patient has functional gastrointestinal (GI) tract, but oral intake is inadequate, unsafe, or not possible.

Patient is malnourished or at high risk for malnutrition and cannot maintain oral intake.

Patient has impaired swallowing function/dysphagia.

Patient is preoperative and severely malnourished and can continue feeding for at least 5 days prior to surgery.

Patient has short bowel syndrome (particularly with colon continuity) and can successfully receive enteral nutrition (EN) by feeding as proximally as possible and/or adjusting the EN formulation.

Patient has ileus, so small bowel feeding may be more successful since ileus often occurs in the stomach or colon.

Contraindications

Patient has a nonoperative mechanical GI obstruction or inability to access GI tract distal to the obstruction.

Patient has intractable vomiting/diarrhea refractory to medical management.

Patient has short bowel syndrome (100–120 cm of small bowel without a colon or 50 cm of small bowel with a colon) with failure of EN.

Patient has paralytic ileus.

Patient has distal high-output fistulas (>500 mL/day) that cannot be bypassed with a feeding tube.

Patient has severe GI bleed resulting in hemodynamic instability.

Patient has severe malabsorption (eg, EN failure as evidenced by progressive deterioration in nutritional status with signs and symptoms of malabsorption such as diarrhea, steatorrhea, nutritional anemias, continued weight loss, and fluid or electrolyte imbalances).

Box Continues

BOX 1.2 Indications and Contraindications for Enteral Nutrition[13-15]

Patient has gastrointestinal discontinuity.

Patient is experiencing significant hemodynamic instability (refer to corresponding section below).

Situation in which the need for EN is expected to last <5 to 7 days for patients who are malnourished or 7 to 9 days for patients who are adequately nourished.

Situation in which EN is not desired by the patient or proxy, such as end of life care.

Enteral Nutrition in Patients Who Are Critically Ill

Rationale for Early Initiation of Nutrition Support

In patients who are critically ill, many of the benefits associated with EN are more likely to be realized when EN is initiated within 24 to 48 hours of injury or admission to the ICU.[7] Guidelines from the Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN),[7] the European Society for Clinical Nutrition and Metabolism (ESPEN),[16] and the Canadian Clinical Practice Guidelines (CCPG)[17] also recommend initiating EN within 24 to 48 hours of injury or admission to the ICU.

EXPERT INSIGHT

There is now evidence to suggest that early enteral feeding, compared with delayed enteral feeding, is associated with improved mortality and decreased infectious complications, but may not affect ICU or hospital length of stay.[17]

Energy Needs

Box 1.3 summarizes current practice recommendations from ASPEN/SCCM and ESPEN for assessing energy needs for patients who are critically ill.[7,16,18]

BOX 1.3 Practice Guidelines for Assessing Energy Needs[7,16,18]

ASPEN/SCCM[7,18]	ESPEN[16]
12 to 25 kcal/kg/d during the first 7 to 10 days of ICU admission (Weak recommendation)	Preferred method: indirect calorimetry; provide <70% MEE during early phase of critical illness and after day 3, increase to 80% to 100% MEE If indirect calorimetry unavailable, provide <70% of calculated energy needs the first week

Abbreviations: ASPEN, American Society for Parenteral and Enteral Nutrition; ESPEN, European Society for Clinical Nutrition and Metabolism; ICU, intensive care unit; MEE, measured energy expenditure; SCCM, Society of Critical Care Medicine

The ASPEN practice guidelines suggest a relatively wide range for estimating energy needs based on the lack of evidence supporting lower vs higher energy levels and clinical outcomes.[7,18] For example, the NUTRIREA-3 trial (published after the ASPEN guidelines) divided patients into a low-energy/protein group (6 kcal/kg and 0.2–0.4 g protein/kg) and a standard-energy/protein group (25 kcal/kg and 1.0–1.3 g protein/kg) for the first week of ICU admission. There was no statistical difference in mortality, dialysis use, or vasopressor weaning between groups, and the low-energy/protein group had favorable outcomes for ICU length of stay, use of mechanical ventilation, and GI and hepatic complications. Compared to the standard group, the low-energy/protein group did not experience adverse outcomes.[19] Based on studies such as NUTRIREA-2 and NUTRIREA-3, Patel and colleagues argue there may be a "sweet spot" for providing EN during the early phases of critical illness by providing less than full feeds to help mitigate risk of harm.[20]

The ESPEN practice guidelines advocate use of indirect calorimetry to estimate energy needs with a stepwise process for advancing the kilocalorie level during the first week of critical illness.[16] If indirect calorimetry is not available, it is recommended to provide <70% of calculated energy needs during the first week of critical illness.[16]

With respect to obesity, the 2016 ASPEN guidelines suggest that for all classes of obesity, patients should receive 65% to 70% of target energy needs as determined by indirect calorimetry. If indirect calorimetry is unavailable, it is suggested to use the weight-based equation 11 to 14 kcal/kg actual body weight per day for patients with BMI in the range of 30 to 50 and 22 to 25 kcal/kg ideal body weight per day for patients with BMI >50.[7] Recognizing the heterogeneity of body composition and metabolism among patients who are obese, ESPEN advocates use of an isocaloric high protein diet preferentially guided by indirect calorimetry measurements and urinary nitrogen losses.[16]

Protein Needs

Box 1.4 summarizes current practice recommendations from ASPEN/SCCM and ESPEN for assessing protein needs for patients who are critically ill.[7,16,18]

BOX 1.4 Practice Guidelines for Assessing Protein Needs[7,16,18]

ASPEN/SCCM[7,18]	ESPEN[16]
1.2–2.0 g/kg/d (Weak recommendation)	1.3 g/kg/d delivered progressively

Abbreviations: ASPEN, American Society for Parenteral and Enteral Nutrition; ESPEN, European Society for Clinical Nutrition and Metabolism; SCCM, Society of Critical Care Medicine

Newer evidence on protein dosing in critical care has become available since the publication of these guidelines. The EFFORT protein trial[21] was a large, randomized, international study that compared a protein intake of 2.2 g/kg with 1.2 g/kg in patients who were critically ill. Researchers found that the higher doses of protein did not improve hospital mortality, duration of mechanical ventilation, ICU stay, or hospital length of stay in patients who were critically ill and mechanically ventilated. Furthermore, subgroup analysis indicated that patients with acute kidney injury (AKI) and high organ failure scores may be harmed by receiving higher protein doses.[21] In addition, a meta-analysis of 23 randomized controlled trials, including the EFFORT trial, found that higher compared to lower protein delivery in critical illness did not affect clinical outcomes, and may be associated with higher mortality rates in patients with AKI.[22] Further research is needed to evaluate the effect of protein dosing among patients with AKI, during different theoretical

phases of critical illness, and in combination with exercise or physical rehabilitation interventions.[21,22]

For patients who are obese, ASPEN recommends providing protein in a range from 2.0 g/kg ideal body weight per day for patients with a BMI of 30 to 40 up to 2.5 g/kg ideal body weight per day for patients with a BMI ≥40.[7] ESPEN advocates use of a personalized approach for determining protein needs in this population. They suggest that protein delivery should first be guided by urinary nitrogen losses or lean body mass determination (using computerized tomography or other tools). If urinary nitrogen losses or lean body mass determination are not available, protein intake can be 1.3 g/kg "adjusted body weight" per day.[16] The authors offer several suggestions for calculating adjusted body weight, with the simplest calculation being to add 20% to 25% of the individual's excess body weight to their calculated ideal body weight.[16]

More recently, a review by Dickerson and colleagues[23] highlighted current knowledge gaps and the complexity involved in screening and assessing for malnutrition, as well as measuring or estimating nutritional needs, in patients who are obese and critically ill. The authors argued that more research is needed to evaluate the applicability of current practice guidelines and to evaluate the role of inflammation and other chronic conditions associated with this patient population.[23]

EXPERT INSIGHT

There is no consensus between researchers, clinicians, and professional organizations on how best to determine the energy and protein needs of patients who are obese. The body composition and metabolic needs of patients who are obese can vary greatly, and more research is needed to better understand how to provide optimal nutrition support to these individuals.

Hemodynamic Instability

Controversy surrounds the use of EN in patients who are critically ill and who may have a poorly perfused GI tract.[7,18,24] Splanchnic blood flow may be diminished in patients who are critically ill, leading to increased risk for bowel ischemia, microbial translocation, and multisystem organ failure.[7,14,24,25] In addition, researchers have speculated that the presence of

nutrients in the GI lumen may increase oxygen demand beyond available delivery of blood, thereby leading to non-occlusive mesenteric ischemia (NOMI) and non-occlusive bowel necrosis (NOBN).[20,22,25] Interestingly, most cases of NOBN have been reported among patients receiving post-pyloric feeding rather than gastric feeding.[20,25] Researchers have theorized that delayed gastric emptying that results in feeding intolerance, therefore stopping or reducing EN delivery, could be protective when the small bowel is poorly perfused.

Fortunately, EN rarely results in ischemic bowel, which is estimated to occur in less than 1% of cases, but rates have been reported between 0.3% to 3.8%.[20,25] However, these rates are significant when extrapolating to the large number of patients who are critically ill and receive EN. The mortality rate from ischemic bowel for patients receiving EN has been reported between 80% and 100%.[20] Although it is not possible to accurately identify all patients at high risk for developing NOMI/NOBN, Box 1.5 lists some potential indicators.[20,24,25]

BOX 1.5 Potential Signs of Enteral Feeding Intolerance Associated with Increased Risk for NOMI/NOBN[20,24,25]

Clinical

Abdominal distention

Nausea

Vomiting

Constipation

Increased nasogastric/orogastric output

Inability to administer and tolerate prescribed enteral nutrition (ie, receiving < goal enteral nutrition due to feeding intolerance)

Increased need for prokinetic agents

Laboratory

Elevated serum lactate

Increased white blood cell count

Hyperkalemia

Hyperphosphatemia

Metabolic acidosis, low bicarbonate

Box Continues

BOX 1.5 Potential Signs of Enteral Feeding Intolerance Associated with Increased Risk for NOMI/NOBN[20,24,25]

Imaging

Dilated, thickened loops of bowel with thumbprinting

Air in the gastrointestinal tract, portal vein, or peritoneal space

Abbreviations: NOBN, non-occlusive bowel necrosis; NOMI, non-occlusive mesenteric ischemia

Recommendations for Use of Enteral Nutrition in Patients at Risk for Hemodynamic Instability

Box 1.6 summarizes current practice recommendations for assessing whether EN is appropriate for patients who are critically ill and at risk for hemodynamic instability.[7,16]

BOX 1.6 Practice Guidelines for Assessing Enteral Nutrition Use with Hemodynamic Instability[7,16]

ASPEN/SCCM[7]

Delay enteral nutrition

Until the patient is fully resuscitated and/or stable

If the patient's mean arterial pressure is <50 mm Hg

When initiating or escalating vasopressors/inotropes

Consider low-dose enteral nutrition

When patient is stable on low-dose vasopressors and/or inotropes; monitor for signs of bowel ischemia

ESPEN[16]

Delay enteral nutrition

In patients with uncontrolled shock and for whom hemodynamic and tissue perfusion goals are not reached

In patients with uncontrolled, life-threatening hypoxemia, hypercapnia, or acidosis

In patients with signs of overt bowel ischemia

Consider low-dose enteral nutrition

When shock is controlled with fluids and vasopressors/inotropes; monitor for signs of bowel ischemia

Abbreviations: ASPEN, American Society for Parenteral and Enteral Nutrition; ESPEN, European Society for Clinical Nutrition and Metabolism; SCCM, Society of Critical Care Medicine

Given the ambiguity and subjectivity in practice guidelines for administering EN in patients with hemodynamic instability, Wang and colleagues conducted a review to assess current literature on the safety of initiating EN in patients with shock receiving vasopressors.[26] They suggest it may be safe to initiate EN if the dosage of norepinephrine or equivalent is less than 0.3 µg/kg/min. This team conducted an additional study and found that initiating EN in patients with shock and norepinephrine-equivalent doses < 0.2 µg/kg/min was associated with reduced risk of gastrointestinal complications and mortality.[27] The ASPEN consensus statement[14] advocates for use of a vasopressor dose equivalence (VDE) score, which is calculated using the following equation:

VDE score = the sum of
norepinephrine dose (mcg/kg/min) × 100
epinephrine dose (mcg/kg/min) × 100
phenylephrine dose (mcg/kg/min) × 10
dopamine dose (mcg/kg/min) × 1
vasopressin dose (U/min) × 250
angiotensin II dose (mcg/kg/min) × 1000
metaraminol dose (mcg/kg/min) × 12.5

The ASPEN consensus statement recommends providing trophic EN or holding EN if the VDE score is > 12.[14] However, the VDE score has not been validated in clinical practice. To date, many studies have been observational and additional research is needed to clarify the optimal time to initiate EN as well as the appropriate dose of EN for patients with varying severities of shock.

Use of Extracorporeal Membrane Oxygenation (ECMO)

Extracorporeal membrane oxygenation (ECMO) is a therapy designed to provide supportive care to patients with respiratory and/or cardiac failure. ECMO can utilize a venovenous (VV) or venoarterial (VA) circuit.[28] VV ECMO is used in patients with respiratory failure such as acute respiratory distress syndrome while VA ECMO is used in patients with cardiogenic shock or circulatory failure.[28] Patients who are critically ill and require ECMO are medically complex and at increased risk for malnutrition. However, small retrospective studies have shown that EN can be safely provided to this patient population. For example, a retrospective review of 65 patients, 36 of whom received early EN (within 48 hours), had their

energy intakes evaluated on ECMO days 3, 7, and 14.[29] These patients had median energy intakes of 500 kcal/d (day 3) and 1,000 kcal/d (days 7, 14). The early EN group was associated with statistically significant benefits in EN tolerance, faster weaning from ECMO, and reduced mortality rates. The authors concluded that starting hypocaloric EN within 48 hours of ECMO initiation is safe and well-tolerated.[29]

More high-quality research is needed to elucidate the nutritional needs of patients who are critically ill and requiring ECMO. In the meantime, Dressen and colleagues have published a review of evidence-based guidance for medical nutrition therapy among patients receiving ECMO.[30] They outline the recommended assessment tools, timing and initiation of nutrition support, as well as the challenges with initiating and maintaining medical nutrition therapy, choosing the most appropriate route of feeding, and mitigating the likelihood of iatrogenic malnutrition caused by nutrition deficits.

Summary of Key Considerations Regarding Enteral Nutrition in Patients Who Are Critically Ill

- Because of the metabolic alterations induced by the inflammatory response, malnutrition develops quickly in patients who are critically ill.
- EN has numerous clinical benefits and is the preferred route of feeding for patients who are critically ill with functional GI tracts.[11-15]
- EN should be initiated within 24 to 48 hours of ICU admission,[7,16,17] but full feeding should likely be avoided during the first week of critical illness or during periods of clinical instability.[16-19]
- Further research is needed to evaluate the protein dosing for patients who are critically ill with AKI and high organ failure scores.[21,22]
- The initiation, timing, and volume of EN appropriate for patients experiencing hemodynamic instability (and possibly a poorly perfused GI tract) is unknown, but clinical guidance exists to help prevent iatrogenic harm from EN.
- Among patients requiring ECMO, hypocaloric EN initiated within 48 hours of ICU admission appears safe, well-tolerated, and may be associated with favorable clinical outcomes.[29]

Indications for Enteral Nutrition for Specific Disease States or Conditions

EN is indicated for a multitude of disease states or conditions in which individuals are unable to meet their nutrition needs through volitional intake. However, many of the studies on specific patient populations still include heterogeneous populations and small sample sizes.

EXPERT INSIGHT

Clinicians must continue to carefully assess the needs of their patients and how their patient's condition does or does not apply to available evidence. In addition to staying up to date on emerging clinical studies, professional practice guidelines offer high-level recommendations for providing EN to specific patient populations.

Box 1.7 offers a summary of EN practice resources for specific patient populations.

BOX 1.7 Practice Resources for Enteral Nutrition Use Among Specific Patient Populations

Professional Organization	Resource
ASPEN *Open access*	EN resources ▪ Indications for EN practice tools ▪ Specific patient population resources (fact sheets, videos) Clinical Practice Library ▪ Clinical guidelines ▪ Consensus recommendations ▪ Standards
Website: www.nutritioncare.org	

Box Continues

BOX 1.7 Practice Resources for Enteral Nutrition Use Among Specific Patient Populations

Professional Organization	Resource
ESPEN *Open access*	Guidelines and consensus papers Sample EN topics ▪ Intensive care ▪ Inflammatory bowel disease ▪ Geriatrics ▪ Acute or chronic kidney disease Website: www.espen.org
Academy of Nutrition and Dietetics *Membership required*	Positions and guidelines ▪ Academy position papers ▪ Consensus reports ▪ Evidence-based practice guidelines, including the Evidence Analysis Library ▪ Systematic reviews Website: www.eatrightpro.org
Critical Care Nutrition *Open access*	Systematic reviews on a wide range of EN topics ▪ Updated by topic as new randomized controlled trials are published ▪ Focus is critical care conditions Website: www.criticalcarenutrition.com
Cochrane Library *Open access*	Systematic review library Sample EN topics ▪ Crohn's disease ▪ Liver transplant ▪ ALS ▪ ARDS Website: www.cochrane.org

Abbreviations: ALS, amyotrophic lateral sclerosis; ARDS, acute respiratory distress syndrome; ASPEN, American Society for Parenteral and Enteral Nutrition; EN, enteral nutrition; ESPEN, European Society for Clinical Nutrition and Metabolism

Ethical Considerations in the Administration of Enteral Nutrition

Artificially administered nutrition and hydration (AANH), including PN and/or EN, is a medical treatment that may not be indicated in cases in which other treatments are not offered or initiated, or when treatment is withdrawn. Typical clinical situations in which patients or surrogate decision makers may decline EN include:

- Prolonged disorders of consciousness, including neurocognitive disorders (eg, Alzheimer disease, Parkinson disease), chronic alcohol abuse, or certain infectious causes.[31]
- Minimally conscious states including the condition formally known as persistent vegetative state.[31]
- End-stage organ failure, such as acute or chronic kidney disease where renal replacement therapy is not an option.
- Terminal illnesses, such as metastatic cancer, or in infants and children born with devastating neurological conditions or irreversible intestinal failure.[31]

The Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Revised 2021 Standards of Practice and Standards of Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Nutrition Support outlines that RDNs "must consider the ethical implications of nutrition and hydration, particularly in certain populations, such as those with dementia or receiving palliative or end-of-life care. Care decisions need to reflect the wishes of the patient/client and/or family/surrogate decision-maker, consistent with an advanced directive that may be in place."[32]

Furthermore, RDNs must adhere to the Academy of Nutrition and Dietetics *Code of Ethics for the Nutrition and Dietetics Profession* (Academy/CDR COE), which requires credentialed practitioners to adhere to the ethical principles of autonomy, beneficence, non-maleficence, and justice.[33] This practice document also outlines a structured model for ethical decision making which includes[33]:

- Step 1: State the ethical dilemma.
- Step 2: Connect the ethical theory to practice.
- Step 3: Apply the Academy/CDR COE to the issue.
- Step 4: Select the best alternative to justify your decision.
- Step 5: Develop strategies to successfully implement the chosen decision.

It is important that RDNs understand the social and cultural implications of AANH as well as the medical, ethical, and legal ramifications of its use in order to best assist patients and family members in the decision-making process.[34,35] RDNs have an opportunity to work as part of an interdisciplinary care team to promote patient-centered care through advanced care planning and patient/family conversations, and to help determine if AANH, including EN, is indicated.[34,35]

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