



Complete Summary

GUIDELINE TITLE

Selection and initiation of specialized nutrition support therapy for the University of Pennsylvania Health System: recommendations of the UPHS Nutrition Task Force.

BIBLIOGRAPHIC SOURCE(S)

Agarwal R, Aloupis M, Compher C, Golaszewski A, Hudson L, Kennedy S, Koethe J, Lynch R, Melvin M, Spencer C, Umscheid C, Wernsing D, Williams J. Selection and initiation of specialized nutrition support therapy for the University of Pennsylvania Health System: recommendations of the UPHS Nutrition Task Force. Philadelphia (PA): University of Pennsylvania; 2008 Mar. 142 p. [97 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Any disease or condition requiring specialized nutrition support therapy (forced enteral or parenteral nutrition therapy) including:

- Severe traumatic brain injury
- Major trauma/surgery
- Critical illnesses requiring mechanical ventilation
- Conditions in which patients are anticipated to be nothing by mouth (NPO) for more than 7 days

- Malnourishment anticipated for more than 2 days

GUIDELINE CATEGORY

Evaluation
Management
Treatment

CLINICAL SPECIALTY

Critical Care
Emergency Medicine
Gastroenterology
Infectious Diseases
Nutrition

INTENDED USERS

Advanced Practice Nurses
Dietitians
Nurses
Pharmacists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To support general practice throughout the in-patient hospital setting for patients receiving nutritional replacement
- To answer specific questions about the utilization of enteral and parenteral nutrition in the inpatient setting

TARGET POPULATION

Adult patients in the University of Pennsylvania Health System inpatient hospital setting who require enteral or parenteral nutrition

INTERVENTIONS AND PRACTICES CONSIDERED

Specialized Nutritional Support (SNS) Therapy

1. Forced enteral therapy
 - Gastric enteral nutrition
 - Use of a promotility agent (metoclopramide, erythromycin)
 - Small bowel enteral nutrition with or without gastric decompression
2. Parenteral nutrition therapy
 - Catheter selection and placement
 - Use of standardized processes of parenteral nutrition management
3. Use of commercial and customized preparations
4. Monitoring the use of SNS, the placement of catheters for SNS, and adverse events

MAJOR OUTCOMES CONSIDERED

- Glasgow Outcome Scale score
- Nitrogen balance
- Infection rate
- Pneumonia
- Duration of intensive care unit or hospitalization stay
- Morbidity and mortality
- Surgical intervention
- Duration of mechanical ventilation
- Hemodynamic and metabolic response
- Residual volume
- Gastroesophageal reflux rate
- Failure of nutrition therapy
- Thrombophlebitis rate
- Rate of catheter malposition
- Catheter sepsis rate
- Organ failure

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Literature Search

Study Designs: Systematic reviews, randomized clinical trials, prospective controlled clinical trials, pre-post designs

Inclusion and Exclusion Criteria

Participants: Adult patients on enteral or parenteral nutrition

Interventions and Comparisons: Early vs. late initiation of enteral feeding, supine vs. semi-recumbent position for enteral feeding, efficacy of prokinetics used in patients intolerant to gastric feedings, small bowel versus gastric feeding, effect of using enteral nutrition in patients with hemodynamic instability, utility of trophic feeds, short term vs. long term use of total parenteral nutrition (TPN), parenteral nutrition (PN) vs. enteral nutrition (EN) for pancreatitis and Inflammatory Bowel Disease (IBD), comparisons between the different types of access used for administration of PN, standardized vs. tailored EN/PN preparations

Outcomes: Mortality, pneumonia, residual volume, duration of mechanical ventilation, length of stay (hospital and Intensive Care Unit [ICU]), gastroesophageal reflux, failure of nutrition therapy, infections, thrombophlebitis, catheter malposition, catheter-related sepsis, organ failure, surgical intervention

Other: English language, published studies

Data Collection

Databases: MEDLINE, COCHRANE, CINAHL, National Guideline Clearinghouse (NGC)

NUMBER OF SOURCE DOCUMENTS

2,616 total studies were initially identified (including duplicates). 96 studies were ultimately used in the review of which 34 were guidelines/systematic reviews/meta-analyses, 60 were randomized controlled trials, and 2 were pre-post designs.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Data Analysis (calculation of relative risks (RR), mean differences and confidence intervals, meta-analyses, exploration of heterogeneity)

0.5 was added to all zero cells to calculate RR. Meta-analyses were performed using the random effects model when Q for heterogeneity was ≤ 0.10 (or $I^2 \geq 50\%$). If not fixed effects model was used. All statistical analyses were performed using Review Manager (RevMan) [Computer program]. Version 4.2 for Windows. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2003.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The University of Pennsylvania Health System (UPHS) Nutrition Task Force was formed with the intention of adapting Hospital of the University of Pennsylvania (HUP's) recently completed Specialized Nutrition Support (SNS) Feeding Guideline (see Appendix 2 in the original guideline document) to all UPHS hospitals. Thus, nutrition support experts from Hospital of the University of Pennsylvania (HUP),

Penn-Presbyterian Medical Center (PPMC) and Pennsylvania Hospital (PAH) were identified by medical leadership and invited to participate in the development of the guideline. The co-chairs of the original HUP guideline were also invited to participate. At the first meeting, the HUP guideline was reviewed, and a list of key questions resulting from that review was generated by the experts. The final key questions were:

1. What is the ideal time to initiate enteral nutrition?
2. What are the effects of enteral nutrition in patients with hemodynamic instability?
3. What is the efficacy and safety of trophic feeds?
4. How does enteral nutrition compare with parenteral nutrition regarding its efficacy and safety in patients with pancreatitis and inflammatory bowel disease?
5. What should the body posture be when a patient is on enteral nutrition?
6. What are the possible interventions to decrease gastric residuals?
7. Is there any benefit of short term (3-5 days) use of total parenteral nutrition?
8. What is the most appropriate form of access for administering total parenteral nutrition?
9. How do standardized and tailored enteral/parenteral nutrition preparations compare in terms of efficacy and safety?

At the second meeting, nutrition use data from all three hospitals was reviewed (see Appendix 3 of the original guideline document) along with blood stream infection data (see Appendix 4 of the original guideline document), and a systematic review of the literature targeted to the key questions and performed by the Center for Evidence-based Practice (CEP) was presented to the experts for feedback (Appendix 5). At the third meeting, a draft guideline based on the original HUP guideline and adapted using the CEP evidence review was presented to the experts for feedback. The guideline was revised over email by consensus. The guideline was finalized with feedback from interventional radiology, infectious disease and nursing.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

At the third meeting, a draft guideline based on the original Hospital of the University of Pennsylvania (HUP) guideline and adapted using the Center for Evidence-based Practice (CEP) evidence review was presented to the experts for

feedback. The guideline was revised over email by consensus. The guideline was finalized with feedback from interventional radiology, infectious disease and nursing.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Specialized Nutrition Support (SNS) is defined as forced enteral or parenteral nutrition therapy.

1. The Task Force recommends SNS be initiated as soon as possible (preferably within 24-48 hours) in the following patient populations:
 - a. Major trauma/surgery
 - b. Severe traumatic brain injury (TBI)
 - c. Critically ill - ventilated
2. The Task Force supports the initiation of SNS as soon as possible in the following patient populations:
 - a. Any patient anticipated to be nothing by mouth (NPO)>7 days
 - b. Malnourished patients anticipated to be NPO>2 days
3. The Task Force recommends enteral nutrition (EN) as the preferred route for feeding when oral intake is precluded. In such situations, they support the following timeline for the placement of an enteral access device:
 - a. As soon as possible (preferably within 24-48 hours) for critically ill - ventilated patients
 - b. Intra-operative placement of temporary or permanent access for all major surgeries after which oral intake will be precluded for an extended period of time
4. The Task Force supports the following contraindications to EN:
 - a. Paralytic ileus
 - b. Bowel obstruction
 - c. Uncontrolled diarrhea (> 500 mL/day or volume that exceeds EN feeds administered)
 - d. High output fistula
 - e. Unable to obtain safe enteral access (e.g., uncorrectable coagulopathy, severe thrombocytopenia, severe neutropenia, anatomic defect)
 - f. Incomplete resuscitation/hemodynamic instability as defined by the Intensive Care Unit (ICU) attending physician
5. If there are no contraindications to EN, the Task Force recommends a trial of gastric EN in all patients without contraindications to gastric EN.
6. The Task Force supports the following contraindications to gastric EN:
 - a. Head of bed (HOB) >30 degrees not possible
 - b. Intractable nausea/vomiting
 - c. Severe reflux
 - d. History of aspiration of gastric EN
 - e. Gastroparesis
 - f. Foregut surgery (esophagus or gastric reduction surgery)

- g. Relative contraindication – Glasgow Come Scale (GCS)<9
- 7. If gastric EN is poorly tolerated, the Task Force recommends the use of a promotility agent. The Task Force supports the use of metoclopramide as a first line agent and erythromycin as a second line agent.
- 8. If gastric EN is contraindicated or fails despite promotility agents, the Task Force supports small bowel EN (i.e., placement of a post-pyloric nasoenteric tube, ideally distal to the Ligament of Treitz) with or without gastric decompression.
- 9. The Task Force supports the definition of failed gastric EN as:
 - a. Failed enteral access or <40-60% goal EN despite the above measures in the following time frame:
 - i. >2 days in patients with severe TBI
 - ii. >2 days in patients with severe malnutrition
 - iii. >5 days in patients with major trauma
 - iv. >7 days in all other patients
 - b. Two consecutive gastric residuals >250 mL despite the above measures and in the above time frame
 - c. Aspiration of EN despite the above measures
- 10. If EN is contraindicated (as described in recommendation #4) or a trial of EN fails (as described in recommendation #8) the Task Force supports the use of parenteral nutrition (PN) if prolonged nutrition support is anticipated (as described in recommendation #1 and #2).
- 11. If PN is indicated in the hospital, the Task Force recommends delivery of PN using a dedicated single lumen peripherally inserted central catheter (PICC). Alternatively, PN may be given via a dedicated single lumen centrally placed catheter or a free dedicated lumen in a pre-existing multi-lumen centrally placed catheter. The Task Force supports systemwide line policies that help nurses identify the safest lumens in a multi-lumen catheter to dedicate to PN (i.e., those lumens that have been least handled). The Task Force also supports clinicians' judgment to place a virgin lumen if dedication of the pre-existing lumen to PN is thought to place the patient at undue risk of infection (e.g., the pre-existing lumen was placed emergently). The Task Force supports tunneling subclavian lines, implanted subcutaneous ports or PICC lines for longer-term use (more than 30 days).
- 12. The Task Force supports the use of standardized processes for PN management (including ordering, labeling and administration), the use of commercial preparations of EN and PN for general patient populations, and the use of customized formulations as appropriate for patients with complex nutrition requirements.
- 13. The Task Force recommends PN be withdrawn once adequate oral or EN is tolerated and nutritional status is stable.
- 14. The Task Force recommends that each University of Pennsylvania Health System (UPHS) hospital monitor the use of SNS, the placement of catheters for SNS, and adverse events associated with SNS or catheter use. Specific data to be collected may include the use of PN by service, the duration of PN use, contraindication to EN or reason EN trial failed, type of catheter used to administer PN (PICC, position of centrally placed lines, number of lumens), the number and type of catheter(s) in place at the time of catheter placement for PN, and adverse events like aspiration pneumonias in those on EN, and

blood stream infections and line removals secondary to complications in those on PN.

15. The Task Force recommends randomized controlled studies examining the efficacy and safety of trophic feeds and/or PN in patients who cannot tolerate goal enteral feeds. They also recommend studies examining the safety of virgin lines versus dedicated lines for the administration of PN.

CLINICAL ALGORITHM(S)

Algorithms are provided in the original guideline document for University of Pennsylvania Health System (UPHS) Specialized Nutrition Support Guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting each recommendation was not specifically stated.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Safe and effective utilization of enteral and parenteral nutrition in the inpatient setting

POTENTIAL HARMS

Complications from nutritional support therapy

CONTRAINDICATIONS

CONTRAINDICATIONS

Contraindications to Enteral Nutrition (EN)

- Paralytic ileus
- Bowel obstruction
- Uncontrolled diarrhea (>500 mL/day or volume that exceeds EN feeds administered)
- High output fistula
- Unable to obtain safe enteral access (e.g., uncorrectable coagulopathy, severe thrombocytopenia, severe neutropenia, anatomic defect)
- Incomplete resuscitation/hemodynamic instability as defined by the Intensive Care Unit (ICU) attending physician

Contraindications to Gastric EN

- Head of bed (HOB) >30 degrees not possible
- Intractable nausea/vomiting

- Severe reflux
- History of aspiration of gastric EN
- Gastroparesis
- Foregut surgery (esophagus or gastric reduction surgery)
- Relative contraindication – Glasgow Coma Scale (GCS)<9

QUALIFYING STATEMENTS

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The guidelines are intended to support general practice throughout the inpatient hospital setting. In some cases unit guidelines may provide additional details that are specific to the patient population served. These recommendations are based on an assessment of the overall quality of evidence for each question examined as well as the important trade-offs between the potential benefits and harms of the interventions examined, and constitute a guideline that should inform, but not replace, expert clinical judgment. In addition, these recommendations are intended for patients whose plan of care, personal interests and clinical status is consistent with aggressive nutrition therapy.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Safety
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Agarwal R, Aloupis M, Compher C, Golaszewski A, Hudson L, Kennedy S, Koethe J, Lynch R, Melvin M, Spencer C, Umscheid C, Wernsing D, Williams J. Selection and initiation of specialized nutrition support therapy for the University of Pennsylvania Health System: recommendations of the UPHS Nutrition Task Force. Philadelphia (PA): University of Pennsylvania; 2008 Mar. 142 p. [97 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2008 Mar

GUIDELINE DEVELOPER(S)

University of Pennsylvania Health System - Academic Institution

SOURCE(S) OF FUNDING

University of Pennsylvania Health System

GUIDELINE COMMITTEE

University of Pennsylvania Health System (UPHS) Nutrition Task Force

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force Members: Rajender Agarwal; Marianne Aloupis; Charlene Compher; Ame Golaszewski; Lauren Hudson; Susan Kennedy; John Koethe; Randy Lynch; Michael Melvin; Carolyn Spencer; Craig Umscheid; David Wernsing; Jennifer Williams

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) by request. Please contact Katie.thomas@uphs.upenn.edu.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI Institute on January 15, 2009. The information was verified by the guideline developer on February 4, 2009.

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