Clinical Practice Guidelines for Nutrition Support In Mechanically Ventilated, Adult Critically Ill Patients

Critical Care Nutrition

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Language of Summary Recommendations*:*

Conditions	**Language of Recommendation**
No reservations about endorsing intervention.	"strongly recommend"
Evidence supportive but minor uncertainties about safety, feasibility, or costs of intervention.	"recommend"
Supportive evidence weak and/or major uncertainties about safety, feasibility, or cost of intervention.	"should be considered"
Inadequate or conflicting evidence.	"insufficient data"

Color of Summary Recommendations:

Recommendation	**Colour code**
Recommend to do	Green
Recommend not to do	Red
Should be considered	Yellow
Insufficient data	White

Level of Evidence:

Level 1: Randomization concealed, outcome adjudication blinded, intention to treat analysis performed.

Level 2: If any of the above characteristics unfulfilled.

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ENTERAL NUTRITION (EN)	**RECOMMENDATION**
EN vs PN.	Based on 1 level 1 study and 12 level 2 studies, when considering nutrition support for critically ill patients, we ***strongly recommend*** the use of EN over PN.
Early vs delayed nutrient intake.	Based on 8 level 2 studies, we ***recommend*** early EN (within 24-48 hours of admission) in critically ill patients.
Protein/peptides.	Based on 4 level 2 studies, when intiating enteral feeds, we ***recommend*** the use of a whole protein formula (polymeric) in critically ill patients.
Small bowel feeding.	Based on 11 level 2 studies, small bowel feeding compared to gastric feeding may be associated with a reduction in pneumonia in critically ill patients. In units where obtaining small bowel access is feasible, we ***recommend*** the routine use of small bowel feedings. In units where obtaining small bowel access involves more logistical difficulties, small bowel feeding ***should be considered*** for patients at high risk for intolerance to EN (on inatropes, continuous infusion of sedatives, or paralytic agents, or patients with high nasogastric drainage) or at high risk for regurgitation and aspiration (nursed in supine position). Finally, in units where obtaining small bowel access is not feasible (no access to fluoroscopy or endoscopy and blind techniques not reliable) small bowel feedings ***should be considered*** for those patients who repeatedly demonstrate high gastric residual volumes and are not tolerating adequate amounts of EN delivered into the stomach.
Body position.	Based on 1 level 2 study, we ***recommend*** that critically ill patients receiving EN have the head of the bed elevated to 45 degrees. Where this is not possible, attempts to raise the head of the bed as much as possible ***should be considered***.
Fish oils.	Based on 1 level 1 study, the use of an enteral formula with fish oils, borage oils, and antioxidants ***should be considered*** in patients with acute respiratory distress syndrome (ARDS).
Motility agents.	Based on a systematic review, in critically ill patients who experience feed intolerance (high gastric residuals, emesis) the use of metoclopramide as a motility agent ***should be considered***.
Achieving target dose of EN.	Based on 1 level 2 study, when intiating EN in head-injured patients, strategies to optimise delivery of nutrients (starting at target rate, higher threshold of gastric residual volumes and use of small bowel feedings) ***should be considered***. In other critically ill patients there are **insufficient data** to make a recommendation.
Glutamine.	Based on 1 level 1 and 4 level 2 studies, enteral glutamine ***should be considered*** in burn and trauma patients. There are ***insufficient data*** to support the routine use of enteral glutamine in other critically ill patients.
Feeding protocols.	There are ***insufficient data*** to recommend the use of a feeding protocol in critically ill adult patients. If a feeding protocol is to be used, based on 1 level 2 study, a protocol that incorporates prokinetics (metoclopramide) at initiation and tolerates a higher gastric residual volume (250 mls) ***should be considered*** as a strategy to optimise delivery of EN in critically ill adult patients.
Diets supplemented with arginine/other select nutrients.	Based on 2 level 1 studies and 12 level 2 studies, we ***recommend*** that diets supplemented with arginine and other selected nutrients ***not be*** used for critically ill patients.
Combination PN and EN.	Based on 5 level 2 studies, for critically ill patients starting on EN, we ***recommend*** that PN ***not be*** started at the same time as EN. In the patient who is not tolerating adequate EN, there are **insufficient data** to put forward a recommendation about when PN should be intiated. Practitioners will have to weight the safety and benefits of intiating PN in patients not tolerating EN on an individual case-by-case basis. We ***recommend*** that PN ***not be*** started in critically ill patients until all strategies to maximize EN delivery (such as small bowel feeding tubes, motility agents) have been attempted.
Closed vs open systems; Probiotics; pH; Fiber; High fat/Low CHO; Low fat /High CHO; Continuous vs other administration methods	***Insufficient data.***

PARENTERAL NUTRITION (PN)	RECOMMENDATION
Glutamine.	Based on 2 level 1 studies and 3 level 2 studies, when PN is prescribed to critically ill patients, parenteral supplementation with glutamine, where available, is ***recommended*****.** There are insufficient data to generate recommendations for IV glutamine in critically ill patients who are receiving EN.
Hypocaloric PN.	Based on 2 level 2 studies, in critically ill patients who are not malnourished, are tolerating some EN, or when PN is indicated for short term (<10 days), hypocaloric PN ***should be considered***. There are ***insufficient data*** to make recommendation about the use of hypocaloric PN or withholding of lipids in the following patients: those requiring PN for long term (>10 days), obese critically ill patients, and malnourished critically ill patients. Practitioners have to weigh the safety and benefits of hypocaloric PN/withholding lipids on an individual case-by-case basis in these latter patient populations.
Use of lipids.	Based on 2 level 2 studies, in critically ill patients who are not malnourished, are tolerating some EN, or when PN is indicated for short term (<10 days), the withholding of lipids ***should be considered***. There are ***insufficient data*** to make recommendations about the withholding of lipids in critically ill patients who are malnourished or those requiring PN for long term (>10 days). Practitioners have to weight the safety and benefits of withholding lipids on an individual case-by-case basis in these latter patient populations.
Intensive insulin therapy.	Based on 1 level 2 study, in surgical critically ill patients receiving nutrition support, intensive insulin therapy to tightly control blood sugars between 4.4 – 6.1 ***should be considered***. There are ***insufficient data*** to make a recommendation regarding intensive insulin therapy in other critically ill patients.
PN vs standard care.	Based on 5 level 2 studies, for critically ill patients starting on EN, we ***recommend*** that PN ***not be*** started at the same time as EN. In the patient who is not tolerating adequate EN there are ***insufficient data*** to put forward a recommendation about when PN should be intiated. Practitioners have to weigh the safety and benefits of intiating PN in patients not tolerating EN on an individual case-by-case basis. We ***recommend*** that PN ***not be*** started in critically ill patients until all strategies to maximise EN delivery (such as small bowel feeding tubes, motility agents) have been attempted.
Branch Chain Amino Acids; Type of lipids; Zinc; Antioxidant strategies: Combined: single and multimodal; Mode of lipid delivery; Selenium	***Insufficient data.***

In order to aid in the implementation of the Clinical Practice Guidelines please refer to the following resources:

Enteral Nutrition in The Critically Ill – Practice Guidelines
Enteral Nutrition: Management of Diarrhea Guideline
Care and Management of Nasoduodenal Feeding Tubes
Parenteral Nutrition Guidelines
Enteral Nutrition Feeding Guideline
Enteral Nutrition – Problem Solving Guide
Routes of Nutrition Support Guideline
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Formatted by: Jan Greenwood, RD (Vancouver General Hospital) in collaboration with the Canadian Critical Care Practice Guidelines Committee (CCCPGC) (7/7/03)