Applying the 2016 ASPEN/SCCM Critical Care Guidelines to Your Practice

Susan Brantley, MS, RD, LDN
Objectives:

Upon completion of this presentation, participants should be able to:

1. Distinguish the meanings of the grading systems used during the preparation of the 2016 ASPEN/SCCM Critical Care Guidelines.
2. Describe the changes made in the 2016 ASPEN/SCCM Critical Care Guidelines when compared to the 2009 Guidelines.
3. Apply and implement the specific guidelines that will most affect the nutrition support of critically ill patients.
Why are Evidence-Based Guidelines Important?

- A gap exists between best evidence and best practice
- Brings solid evidence for optimal care to the bedside
  - Reduce variations in patient care
  - Improves safety in patient care
  - Provide benchmarks against which care can be measured
- Helps contain costs
Why are Evidence-Based Guidelines Important?

- In the future of healthcare, the opportunity to improve patient outcomes will result from more effective delivery of existing therapies rather than the development of new treatments.
- We, as caregivers, can be a part of this new revolution by:
  - Evaluating the institutional MISSION & GOALS
  - Evaluate EBGs that are appropriate to improve patient care in each clinical setting
Why are Evidence-Based Guidelines Important?

- Serve as tools for enhancing our clinical practice
  - Help us evaluate what we are currently doing
  - Guide us on what we need to do
  - Assist us in reorganizing our work processes
  - Create new opportunities
  - Improve our value within the existing system
Why are Evidence-Based Guidelines Important?

- Serve as tools for enhancing our clinical practice
  - Help us evaluate what we are currently doing
  - Guide us on what we need to do
- Assist us in reorganizing our work processes
- Create new opportunities
- Improve our value within the existing system
Why are Evidence-Based Guidelines Important?

- Serve as tools for enhancing our clinical practice
  - Help us evaluate what we are currently doing
  - Guide us on what we need to do
  - Assist us in reorganizing our work processes
- Create new opportunities
- Improve our value within the existing system
Why are Evidence-Based Guidelines Important?

- Serve as tools for enhancing our clinical practice
  - Help us evaluate what we are currently doing
  - Guide us on what we need to do
  - Assist us in reorganizing our work processes
  - Create new opportunities
  - Improve our value within the existing system
Why are Evidence-Based Guidelines Important?

- Serve as tools for enhancing our clinical practice
  - Help us evaluate what we are currently doing
  - Guide us on what we need to do
  - Assist us in reorganizing our work processes
  - Create new opportunities
  - Improve our value within the existing system
Identifying Malnutrition: An example of the process

- Evaluate patients for the presence of MALNUTRITION
  - How will doing this help your institution meet its goals?
- Assess MALNUTRITION appropriately and accurately
  - Are you using the proper tools?
  - Are you willing to give this procedure more of your time?
- Change your practice to identify and diagnose MALNUTRITION early in the hospital stay
- Communicate your findings with the physician (on rounds?) and the coders (direct communication?)
- Increase your value to the organization
Levels of Evidence

- **ASPEN / SCCM**
  - Evaluated primarily Randomized, Controlled Trials (RCTs)
  - Included nonrandomized cohort trials, prospective observational studies, and retrospective case series
  - If the strongest available evidence was a meta-analysis, the studies from the meta-analysis were used to determine the quality of the evidence
  - When no RCT or observational study was available to answer a question directly, consensus of the author group on the best clinical practice approach was used, and the recommendation was designated “based on expert consensus.”
In the GRADE approach to Quality of Evidence:

- **Randomized controlled trials** without important limitations provide **high quality** evidence.
- **Observational studies** without special strengths or important limitations provide **low quality** evidence.
  - **Case series and case reports** are observational studies that investigate only patients exposed to the intervention.
- **Expert opinion** is not a category of quality of evidence. Expert opinion represents an interpretation of evidence in the context of experts' experiences and knowledge.
The **strength of a recommendation** reflects the extent to which a guideline panel is confident that desirable effects of an intervention outweigh undesirable effects, or vice versa, across the range of patients for whom the recommendation is intended.
**Implications of strong and weak recommendations for different users of guidelines**

<table>
<thead>
<tr>
<th></th>
<th>Strong Recommendation</th>
<th>Weak Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For Patients</strong></td>
<td>Most individuals in this situation would want the recommended course of action and only a small proportion would not.</td>
<td>The majority of individuals in this situation would want the suggested course of action, but many would not.</td>
</tr>
<tr>
<td><strong>For Clinicians</strong></td>
<td>Most individuals should receive the recommended course of action. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.</td>
<td>Recognize that different choices will be appropriate for different patients, and that you must help each patient arrive at a management decision consistent with her or his values and preferences. Decision aids may well be useful helping individuals making decisions consistent with their values and preferences. Clinicians should expect to spend more time with patients when working towards a decision.</td>
</tr>
</tbody>
</table>
A strong recommendation is one for which guideline panel is confident that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation for an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation against an intervention).
WEAK recommendation

- A weak recommendation is one for which the desirable effects probably outweigh the undesirable effects (weak recommendation for an intervention) or undesirable effects probably outweigh the desirable effects (weak recommendation against an intervention) but appreciable uncertainty exists.
# QUALITY OF EVIDENCE GRADES

<table>
<thead>
<tr>
<th>GRADE DEFINITION</th>
<th>EXPLANATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>We are very confident that the true effect lies close to that of the estimate of the effect.</td>
</tr>
<tr>
<td>MODERATE</td>
<td>We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.</td>
</tr>
<tr>
<td>LOW</td>
<td>Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.</td>
</tr>
<tr>
<td>VERY LOW</td>
<td>We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.</td>
</tr>
</tbody>
</table>
Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)

Stephen A. McClave, MD; Beth E. Taylor, RD, DCN; Robert G. Martindale, MD, PhD; Malissa M. Warren, RD; Debbie R. Johnson, RN, MS; Carol Braunschweig, RD, PhD; Mary S. McCarthy, RN, PhD; Evangelia Davanos, PharmD; Todd W. Rice, MD, MSc; Gail A. Cresci, RD, PhD; Jane M. Gervasio, PharmD; Gordon S. Sacks, PharmD; Pamela R. Roberts, MD; Charlene Compher, RD, PhD; and the Society of Critical Care Medicine and the American Society for Parenteral and Enteral Nutrition

Keywords
- nutrition
- critical care
- intensive care unit
- enteral
- parenteral
- evidence-based medicine
- Grading of Recommendations, Assessment, Development, and Evaluation criteria
- guidelines
Categories for Guidelines

- Nutrition Assessment
- Enteral Nutrition
  - Initiation
  - Dosing
  - Monitoring and Tolerance
  - Formula Selection
  - Additives
- Parenteral Nutrition
  - Indications
  - Formulations
- Nutrition Support in Specific Disease States
- Nutrition Support in Surgery
- Nutrition Support in Sepsis
- Nutrition Support in Chronic Illness/Obesity
NUTRITION ASSESSMENT

• Determine nutrition risk
  • NRS 2002 (ESPEN)
  • NUTRIC score (Canada)

• Include co-morbid conditions in evaluation

• Determine energy requirements
  • Indirect calorimetry
  • Predictive equations
  • 25-30 kcal/kg

• Provide adequate protein
# NRS 2002

## Impaired Nutritional Status

<table>
<thead>
<tr>
<th>Score</th>
<th>Normal Nutritional Status</th>
<th>Score</th>
<th>Normal Nutritional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent: 0</td>
<td>Normal nutritional status</td>
<td>Absent: 0</td>
<td>Normal nutritional requirements</td>
</tr>
<tr>
<td>Mild: 1</td>
<td>Wt loss &gt;5% in 3 mths or food intake below 50 - 75% of normal requirement in preceding week.</td>
<td>Mild: 1</td>
<td>Hip fracture, Chronic patients, in particular with acute complications cirrhosis, COPD*. Chronic haemodialysis, diabetes, oncology</td>
</tr>
<tr>
<td>Moderate: 2</td>
<td>Wt loss &gt;5% in 2 mths or BMI 18.5 - 20.5 + impaired general condition or food intake 25 - 60% of normal requirement in preceding week.</td>
<td>Moderate: 2</td>
<td>Major abdominal surgery, Stroke, Severe pneumonia, hepatologic malignancy</td>
</tr>
<tr>
<td>Severe: 3</td>
<td>Wt loss &gt;5% in 1 mths (&gt;15% in 3 mths) or BMI &lt;18.5 + impaired general condition or food intake 0 - 25% of normal requirement in preceding week.</td>
<td>Severe: 3</td>
<td>Head injury, Bone marrow transplantation, Intensive care patients (APACHE &gt;10)</td>
</tr>
</tbody>
</table>

Score (nutritional status) + score (disease severity) = Total score:

Adjustment for age: if ≥ 70 years: add 1 to total score above

Age-adjusted total score
### Table 1: NUTRIC Score variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>50 - &lt;75</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&gt;75</td>
<td>2</td>
</tr>
<tr>
<td>APACHE II</td>
<td>&lt;15</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>15 - &lt;20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>20-28</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>&gt;28</td>
<td>3</td>
</tr>
<tr>
<td>SOFA</td>
<td>&lt;6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6 - &lt;10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&gt;10</td>
<td>2</td>
</tr>
<tr>
<td>Number of Co-morbidities</td>
<td>0-1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>&gt;2</td>
<td>1</td>
</tr>
<tr>
<td>Days from hospital to ICU admission</td>
<td>0 - &lt;1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>&gt;1</td>
<td>1</td>
</tr>
<tr>
<td>IL-6</td>
<td>0 - &lt;400</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>&gt; 400</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 2: NUTRIC Score scoring system: if IL-6 available

<table>
<thead>
<tr>
<th>Sum of points</th>
<th>Category</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 6-10          | High Score | ➢ Associated with worse clinical outcomes (mortality, ventilation).  
|               |           | ➢ These patients are the most likely to benefit from aggressive nutrition therapy. |
| 0-5           | Low Score  | ➢ These patients have a low malnutrition risk.                                |

### Table 3. NUTRIC Score scoring system: If no IL-6 available*

<table>
<thead>
<tr>
<th>Sum of points</th>
<th>Category</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 5-9           | High Score | ➢ Associated with worse clinical outcomes (mortality, ventilation).  
|               |           | ➢ These patients are the most likely to benefit from aggressive nutrition therapy. |
| 0-4           | Low Score  | ➢ These patients have a low malnutrition risk.                                |
ENTERAL NUTRITION

Enteral nutrition (EN) should be started within 24-48 hours in the critically ill patient who is unable to maintain volitional intake.

Quality of Evidence:
VERY LOW
ENTERAL NUTRITION

- The preferred nutrition support in the critically ill patient is EN
- Bowel sounds and evidence of bowel function is NOT required for the initiation of EN
- Safe to feed into the stomach, but consider changing to a post-pyloric feeding tube when:
  - High risk of aspiration
  - Failed to tolerate gastric feeds in the past
- EN should be held until the patient is fully resuscitated
Dosing of EN

- Patients at **LOW** nutrition risk
  (using NRS 2002 or NUTRIC)
  - Do not require specialized nutrition support for the first week in ICU
  - **Trophic EN** during the first week is appropriate for patients with ARDS, ALI, and those ventilated >3 days

- Patients with **HIGH** nutrition risk
  (using NRS 2002 or NUTRIC)
  - EN should be advanced to goal as tolerated over 24-48 hours.
  - Monitor for refeeding
  - Provide >80% estimated requirements
  - Provide high-dose protein
Monitoring EN Tolerance

- Monitor daily to avoid inappropriate feeding cessation (i.e. NPO for tests or procedures)
- Gastric Residual Volumes (GRVs) should **NOT** be used to assess tolerance or as a marker for aspiration risk (Quality of Evidence: LOW)
  - Holding EN for GRVs <500mL should be avoided
- Implement EN feeding protocols to maximize provision of goal calories (i.e. Volume-based feeding protocols)
Monitoring EN Tolerance

- Assess patients on EN frequently for aspiration risk
  - Use post-pyloric access
  - Use continuous feedings
  - Use prokinetic agents to promote motility
  - Elevate the HOB to 30-45°
  - Use chlorhexidine mouthwash
- No coloring agent should be added to EN as a marker for aspiration of EN
- EN should NOT be interrupted for diarrhea
  - Assess cause and treat as indicated
EN Formula Selection

- Use standard, polymeric formulas when initiating EN in the critically ill patient
  - Avoid routine use of specialty formulas in the MICU patient
  - Avoid use of disease-specific formulas in the SICU patient
- Restrict use of immune-modulating formula to TBI and perioperative SICU patients
- No recommendation for the use of formulas with altered lipid profiles in ARDS and ALI patients
- In the presence of **persistent** diarrhea:
  - Consider use of mixed fiber-containing EN formulas
  - Consider peptide-based EN formulas
EN Additives

- **DO** consider a fermentable soluble fiber additive with a standard EN formula in stable MICU/SICU patients
- **DO NOT** routinely use probiotics in the critically ill patient
- **DO** provide antioxidant vitamins and trace minerals in safe doses to the critically ill patient
- **DO NOT** add supplemental glutamine routinely
Parenteral nutrition (PN) should be held for the first 7 days in the patient at low nutritional risk.

Quality of Evidence:

VERY LOW
Timing for PN

- When EN is not possible in the patient who is at high nutrition risk or who is malnourished, PN should be started as soon as possible following admission to the ICU.

- When unable to meet at least 60% of energy and protein requirements with EN alone after 7-10 days, consider supplemental PN.
In the high-risk or malnourished critically ill patient on PN…

- Use a nutrition support team for management
- Use hypocaloric PN dosing with adequate protein this first week in the ICU
- Withhold or limit soybean oil IV fat emulsions (IVFE) during the first week of PN
  - Use alternative IVFE when available in the US
- No clinical advantage between compounded PN and standardized PN formulations
- Optimal blood glucose range should be between 140-180 mg/dL
- Taper PN when the patient is tolerating 60% of EN
Nutrition Support in Specific Disease States
Nutrition Support in Specific Disease States

### Pulmonary
- High-fat, low-CHO formulas should be avoided with ARF
- Consider volume-restricted formulas
- Monitor serum phosphate levels and replace as appropriate

### Renal Failure
- Use a standard formula in ARF/AKI with adequate protein and calories
- Increase protein with CRRT or frequent HD
- Up to a maximum of 2.5g/kg/d
Nutrition Support in Specific Disease States

- **Hepatic Failure**
  - Use a DRY or USUAL weight in predictive equations; avoid protein restriction
  - EN preferred nutrition support
  - Use standard EN formulas

- **Chronic Illness**
  - Defined as patients with organ dysfunction and an extended ICU stay
  - Aggressive, high-protein EN therapy
Nutrition Support in Specific Disease States

- Acute Pancreatitis
  - Assess disease severity frequently in acute pancreatitis
  - Advance to an oral diet with mild acute pancreatitis
  - EN is preferred in moderate to severe pancreatitis (within 24-48 hours of admission)
  - Use a standard, polymeric EN formula via gastric or jejunal route
  - Consider use of probiotics
  - When EN is **NOT** tolerated:
    - Take measures to improve tolerance
    - Consider PN after 1 week from onset of acute symptoms
Nutrition Support in Specific Disease States

- **Surgical Issues**
  - Trauma – start EN early using a high protein, polymeric diet
    - Consider an immune-modulating formula with arginine and fish oils in severe trauma
  - Traumatic Brain Injury – start EN within 24-48 hours of injury
    - Use if either an immune-modulating formula or supplement with EPA/DHA
Nutrition Support in Specific Disease States

- **Surgical Issues**
  - Open abdomen – in the absence of a bowel injury, start EN within 24-48 hours post-injury
    - Addition of 15-30 grams protein per liter of exudate lost is recommended
  - Burns – start EN unless not feasible or tolerated
    - Indirect calorimetry is recommended
    - Protein needs: 1.5-2.0g/kg/day
    - “Early EN” is within 4-6 hours of injury
Nutrition Support in Specific Disease States

- **Surgical Issues**
  - Major surgery – determine nutrition risk
    - Start EN within 24 hours of surgery
    - Routine use of an immune-modulating formula is recommended
  - Based on “Expert Consensus”…
    - Attempt EN even with a difficult post-op course
    - Delay PN 5-7 days if EN not feasible
    - When diet is advanced, solid foods should be considered over clear liquids
Nutrition Support in Specific Disease States

- **Sepsis**
  - Start EN within 24-48 hours of diagnosis when resuscitated
  - Avoid PN in the acute phase of sepsis regardless of nutritional risk
  - Trophic feeds during initial phase of sepsis (< 500 kcal/d)
    - Advance after 24-48 hours to >80% of target over first week
    - 1.2-2.0g protein/kg/day
Nutrition Support in Specific Disease States

- **Obesity in Critical Illness**
  - Start early EN within 24-48 hours of admission to the ICU
  - Assessment should focus on BMI, SIRS, inflammation or other comorbidities as related to risk for cardiovascular disease and mortality
  - High-protein, hypocaloric feeds to preserve lean body mass and minimize complications of overfeeding
    - Energy: 65-70% of measured energy requirements; 11-14 kcal/kg _ACTUAL_ body weight (BMI 30-50) or 22-25 kcal/kg _IDEAL_ body weight (BMI >50)
    - Protein: 2.0 g/kg _IDEAL_ body weight (BMI > 30-40) and 2.5 g/kg _IDEAL_ body weight (BMI > 40)
  - With a history of bariatric surgery, supplement with thiamine before initiating nutrition therapy; evaluate and supplement other vitamins and minerals
Table 2. Bundle Statements.

- Assess patients on admission to the intensive care unit (ICU) for nutrition risk, and calculate both energy and protein requirements to determine goals of nutrition therapy.
- Initiate enteral nutrition (EN) within 24–48 hours following the onset of critical illness and admission to the ICU, and increase to goals over the first week of ICU stay.
- Take steps as needed to reduce risk of aspiration or improve tolerance to gastric feeding (use prokinetic agent, continuous infusion, chlorhexidine mouthwash, elevate the head of bed, and divert level of feeding in the gastrointestinal tract).
- Implement enteral feeding protocols with institution-specific strategies to promote delivery of EN.
- Do not use gastric residual volumes as part of routine care to monitor ICU patients receiving EN.
- Start parenteral nutrition early when EN is not feasible or sufficient in high-risk or poorly nourished patients.
But, REMEMBER…

The judgment of the healthcare professional based on individual circumstances of the patient must always take precedence over the recommendations in these guidelines.
Identify Barriers to Translating Evidence into Practice

- Characteristics of a great clinician
  - Dietitians should serve as opinion and clinical leaders in the field of nutrition support
    - Participate in multi-disciplinary rounds
      - Be a **resource** for new information
      - *Get involved* in the process
      - *Teach*
      - *Learn*
  - Time should be allocated for implementation
  - Work loads should be adjusted
    - *Prioritize*