Exclusive Joint Webinar Presentation


Presented by Ainsley Malone, MS, RD, CNSC, LD, FAND, FASPEN

Complimentary 1-Credit Continuing Education Webinar
Objectives

1. Describe the practical steps for determining a patient’s/resident’s malnutrition etiology.

2. List the six malnutrition criteria and outline processes for their identification in specific patients/residents.

3. Discuss inclusion of the malnutrition criteria in the nutrition care process and medical record documentation.
Malnutrition – Not a New Issue

PERCENTAGE OF WEIGHT LOSS: BASIC INDICATOR OF SURGICAL RISK IN PATIENTS WITH CHRONIC PEPTIC ULCER

HIRAM O. STUDLEY

(Studley, JAMA, 1936)
Malnutrition Is Common in US Hospitalized Patients

% Malnutrition* in Hospital-Admitted Patients

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Specialty</th>
<th># Pts</th>
<th>Malnourished Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston, MA(^1)</td>
<td>General</td>
<td>251</td>
<td>44%</td>
</tr>
<tr>
<td>Birmingham, AL(^2)</td>
<td>General</td>
<td>134</td>
<td>48%</td>
</tr>
<tr>
<td>Multiple V.A. sites(^3)</td>
<td>General</td>
<td>2,448</td>
<td>39%</td>
</tr>
<tr>
<td>Boston, MA(^4)</td>
<td>Pediatric</td>
<td>224</td>
<td>25%</td>
</tr>
<tr>
<td>Syracuse, NY(^5)</td>
<td>ICU</td>
<td>129</td>
<td>43%</td>
</tr>
<tr>
<td>Chicago, IL(^6)</td>
<td>General</td>
<td>404</td>
<td>54%</td>
</tr>
<tr>
<td>Chicago, IL(^7)</td>
<td>ICU</td>
<td>57</td>
<td>50%</td>
</tr>
<tr>
<td>Chicago, IL(^8)</td>
<td>ICU &gt;65</td>
<td>260</td>
<td>34%</td>
</tr>
<tr>
<td>Pennsylvania 9</td>
<td>General and ICU</td>
<td>274</td>
<td>32%/44%</td>
</tr>
</tbody>
</table>

Malnutrition Prevalence

• General patient population
  – Braunschweig, et al, 2000
  – Observational/retrospective

• Patients with LOS > 7 days (n=404)

• Nutrition assessment via SGA
  – Within 72 hrs of admission and at discharge

<table>
<thead>
<tr>
<th>Nutrition Status</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally Nourished (SGA-A)</td>
<td>46% (n=185)</td>
</tr>
<tr>
<td>Moderately Malnourished (SGA-B)</td>
<td>31% (n=125)</td>
</tr>
<tr>
<td>Severely Malnourished SGA-C</td>
<td>23% (n=94)</td>
</tr>
</tbody>
</table>

Nutritional Change at Discharge

Malnutrition prevalence at discharge: 59%

<table>
<thead>
<tr>
<th>Admission Nutrition Status</th>
<th>Normal (n=185)</th>
<th>Moderate (n=125)</th>
<th>Severe (n=94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>115</td>
<td>52</td>
<td>18</td>
</tr>
<tr>
<td>Moderate</td>
<td>40</td>
<td>60</td>
<td>25</td>
</tr>
<tr>
<td>Severe</td>
<td>11</td>
<td>35</td>
<td>48</td>
</tr>
</tbody>
</table>

Outcome Measurements

<table>
<thead>
<tr>
<th>Variable</th>
<th>Did not decline (n=278)</th>
<th>Declined (n=126)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charges ($)</td>
<td>34,336±1,812</td>
<td>45,762±4,021</td>
</tr>
<tr>
<td>Length of stay</td>
<td>16±0.7</td>
<td>19±1.3</td>
</tr>
<tr>
<td>Complications (%)</td>
<td>50</td>
<td>62</td>
</tr>
<tr>
<td>Infection (%)</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

(Braunschweig et al, J Am Diet Assoc, 2000)
Impact on Patient Outcomes

- *Patient Characteristics and the Occurrence of Never Events*
- US epidemiologic analysis of 887,189 surgery cases from 1368 hospitals, using HCUP NIS data from 2002-2005
- *Malnutrition can dramatically increase the risk of severe events*
  - 4X more likely to develop pressure ulcers
  - 2X more likely to have SSI
  - 5X more likely to have CAUTI

(Fry et al, *Arch Surg*, 2010)
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Malnutrition Diagnosis</th>
<th>No Malnutrition Diagnosis</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>95% CI</td>
<td>Estimate</td>
</tr>
<tr>
<td>Length of stay (mean days)</td>
<td>12.6</td>
<td>12.1-13.1</td>
<td>4.4</td>
</tr>
<tr>
<td>Total costs (mean $)</td>
<td>26,944</td>
<td>25,355-28,533</td>
<td>9,485</td>
</tr>
<tr>
<td>Admission type (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>59.9</td>
<td>57.1-62.7</td>
<td>46.2</td>
</tr>
<tr>
<td>Urgent</td>
<td>19.6</td>
<td>17.2-22.0</td>
<td>18.8</td>
</tr>
<tr>
<td>Elective</td>
<td>17.4</td>
<td>15.3-19.5</td>
<td>24.5</td>
</tr>
<tr>
<td>Newborn</td>
<td>2.2</td>
<td>1.9-2.5</td>
<td>9.9</td>
</tr>
<tr>
<td>Trauma center</td>
<td>0.9</td>
<td>0.6-1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>0.0*</td>
<td>0.0-0.0</td>
<td>0.0*</td>
</tr>
<tr>
<td>Discharge disposition (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine</td>
<td>28.8</td>
<td>27.7-29.9</td>
<td>72.6</td>
</tr>
<tr>
<td>Transfer to short-term hospital</td>
<td>3.6</td>
<td>3.3-3.9</td>
<td>2.1</td>
</tr>
<tr>
<td>Other transfers</td>
<td>38.1</td>
<td>37.2-39.0</td>
<td>12.2</td>
</tr>
<tr>
<td>Home health care</td>
<td>19.8</td>
<td>19.0-20.6</td>
<td>10.4</td>
</tr>
<tr>
<td>Against medical advice</td>
<td>0.6</td>
<td>0.5-0.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Died</td>
<td>8.8</td>
<td>8.5-9.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Discharged alive, destination unknown</td>
<td>0.3*</td>
<td>0.1-0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

(Corkins et al, *JPEN J Parenter Enteral Nutr*, 2014)
Malnutrition in the Surgical Patient

<table>
<thead>
<tr>
<th></th>
<th>High risk group</th>
<th>No risk group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>32 (33.33%)</td>
<td>64 (66.67%)</td>
<td></td>
</tr>
<tr>
<td>Median Age (y)</td>
<td>57 (24–94)</td>
<td>54 (19–90)</td>
<td>NS</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>17 (53.12%)</td>
<td>35 (54.68%)</td>
<td>NS</td>
</tr>
<tr>
<td>Admission- emergency</td>
<td>22 (68.8%)</td>
<td>34 (53.1%)</td>
<td>.3</td>
</tr>
<tr>
<td>(versus elective)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malignancy (versus benign)</td>
<td>14 (43.72%)</td>
<td>12 (18.75%)</td>
<td>.02</td>
</tr>
<tr>
<td>Surgery performed</td>
<td>19 (59.37%)</td>
<td>38 (59.37%)</td>
<td>.8</td>
</tr>
<tr>
<td>LOS (d)*</td>
<td>18.8 ± 11.5</td>
<td>7 ± 5.3</td>
<td>.003</td>
</tr>
<tr>
<td>Nutritional therapy</td>
<td>15.6%</td>
<td>7.9%</td>
<td>.3</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In hospital</td>
<td>3 (9.4%)</td>
<td>0 (0%)</td>
<td>.017</td>
</tr>
<tr>
<td>Cumulative 6 months</td>
<td>6 (18.8%)</td>
<td>1 (1.6%)</td>
<td>.006</td>
</tr>
<tr>
<td>Cumulative 12 months</td>
<td>7 (21.9%)</td>
<td>1 (1.6%)</td>
<td>.002</td>
</tr>
</tbody>
</table>

*Mean ± SD.

Clinical Practice – Coding for Malnutrition

Percentage Of Hospital Discharges With Malnutrition Diagnoses, By Year, United States.

(Corkins et al, *JPEN J Parenter Enteral Nutr*, 2014)
A New Approach to Defining Malnutrition

Consensus Statement

Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition)

Jane V. White, PhD, RD, FADA; Peggi Guenter, PhD, RN; Gordon Jensen, MD, PhD, FASPEN; Ainsley Malone, MS, RD, CNSC; Marsha Schofield, MS, RD; the Academy Malnutrition Work Group; the A.S.P.E.N. Malnutrition Task Force; and the A.S.P.E.N. Board of Directors

Consensus Malnutrition Characteristics

- Unintentional weight loss
- Evidence of inadequate intake
- Loss of muscle mass
- Loss of subcutaneous fat
- Fluid accumulation
- Reduced hand grip strength

The presence of two or more necessary for the diagnosis of malnutrition
Etiology Based Malnutrition Definitions

Nutritional Risk Identified
Compromised intake or loss of body mass. (Jensen, *JPEN J Parenter Enteral Nutr*, 2006)

Inflammation present? No / Yes

- **No**
  - Starvation Related Malnutrition
    (pure chronic starvation, anorexia nervosa)

- **Yes**
  - Mild to Moderate Degree
    - Chronic Disease – Related Malnutrition
      (organ failure, pancreatic cancer, rheumatoid arthritis, sarcopenic obesity)
  - Marked Inflammatory Response
    - Acute Disease or Injury-Related Malnutrition
      (major infection, burns, trauma, closed head injury)
The Inflammatory Response - Acute

Acute Inflammatory Response

Release of Cytokines

Release of Acute Phase Proteins

↑Catabolism
↓Synthesis

High CRP

↑REE

Negative Nitrogen Balance
Laboratory Parameters-Inflammation

- ↓’d serum albumin
- ↓’d serum transferrin
- ↓’d serum prealbumin
- Elevated C-reactive protein (↓’d in liver failure)
- Elevated blood glucose
- ↓’d or increased white blood cell count
- ↑’d percentage of neutrophils in the CBC
- ↓’d platelet count
- Marked negative nitrogen balance
Inflammation and Protein Levels

C-Reactive Protein
- Major acute phase protein
- Effective measure of general inflammation
  - severity and duration

(Fayyad, 2014)
Inflammatory Markers in Organ Failure

• ↑’d TNF, CRP, fibrinogen\(^1\) and neutrophil/leukocyte ratio in COPD\(^2\)

• ↑’d TNF, CRP and interleukin-6 in those with CHF\(^3\)

Clinical Parameters - Inflammation

- Fever
- Hypothermia
- Presence of infection
- Urinary tract infection
- Pneumonia
- Blood stream infection
- Wound or incisional infection
- Abscess
Chronic Disease – Mild to Moderate Inflammatory Response

• Cardiovascular disease
• Celiac disease
• Chronic pancreatitis
• Chronic obstructive pulmonary disease
• Congestive heart failure
• Cystic fibrosis
• Dementia
• Diabetes mellitus
• Inflammatory bowel disease

• Hematologic malignancies
• Metabolic syndrome
• Neuromuscular disease
• Obesity
• Organ failure/transplant (kidney, liver, heart, lung or gut)
• Pressure wounds
• Rheumatoid arthritis
• Solid tumors

Acute Disease/Injury – Severe Inflammatory Response

• Adult respiratory distress syndrome
• Closed head injury
• Critical illness
• Major abdominal surgery
• Major infection/sepsis
• Multi-trauma
• Systemic inflammatory response syndrome
• Severe burns
• Severe acute pancreatitis

Malnutrition Criteria
Insufficient Energy Intake

• Review of food / nutrition intakes
• Obtain calculated / measured energy requirements
• Compare actual vs. requirements
• Report inadequacies as percent consumed over a period of time

(Kondrup, Clin Nutr, 2001)
Tools to Determine Intake Compared with Requirement

• Diet Intake
  – Directly from patient and/or family
  – Diet history/24 hour recall/3 day recall, etc.
    • Less than half of your meals
    • Less than 75% of your meals

• Meal assessment – during hospitalization
  – Categorizes by %
    • 100, 75, 50, 25, 0

• Nutrition intervention during hospital course

• Estimating requirements
  – Indirect calorimetry
  – Energy equations (Mifflin St Jeor, Penn State, etc)
Unintentional Weight Loss

• Unintended weight loss is a well-validated indicator of malnutrition
• Frequent weighing is preferred standard
• Factors that interfere with weight accuracy
  – Underlying disease state
  – Fluid status
  – Equipment malfunction / human error
  – Errors in recall

(Jensen, *JPEN J Parenter Enteral Nutr*, 2012)
Weight Loss

• Usual weight should be used to determine percent of weight loss over time
• Bed scale vs. standing measurement
• Follow weight patterns
• Estimate dry weight (consider height, previous history, intake status)

Loss of Subcutaneous Fat and Muscle

Tools to Determine Body Composition

- Anthropometric Measurements - skinfolds, circumference
- Bioelectrical Impedance
- BodPod
- Body Mass Index (low)
- Physical Exam
Nutrition-Focused Physical Exam

- Exam which uses physical assessment and physical function findings to help determine nutritional status and diagnose malnutrition
- Systematic approach (head-to-toe)
- Components
  - Use observation and palpation techniques
  - Confer findings with patient
- An expected competency for all RDN’s
- Multiple educational workshops
- Abbott Nutrition Health Institute Simulation module [https://anhi.org/login](https://anhi.org/login)
## Physical Assessment - Fat

<table>
<thead>
<tr>
<th>Exam Area</th>
<th>Tips</th>
<th>Severe Malnutrition</th>
<th>Mild-Moderate Malnutrition</th>
<th>Well Nourished</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subcutaneous Fat Loss</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orbital Region</td>
<td>View patient when standing directly in front of them; touch above cheekbone</td>
<td>Hollow look, depressions, dark circles, loose skin</td>
<td>Slightly dark circles, somewhat hollow look</td>
<td>Slightly bulged fat pads. Fluid retention may mask loss</td>
</tr>
<tr>
<td>Upper Arm Region</td>
<td>Triceps/Biceps</td>
<td>Arme bent, roll skin between fingers, do not include muscle in pinch</td>
<td>Very little space between folds, fingers touch</td>
<td>Some depth pinch but no ample</td>
</tr>
<tr>
<td>Thoracic and Lumbar Region – Ribs, Lower Back, Midaxillary Line</td>
<td>Have patient press handshard against a solid object</td>
<td>Depression between ribs very apparent Iliac crest very prominent</td>
<td>Ribs apparent, depressions between them less pronounced Iliac crest somewhat prominent</td>
<td>Chest is full; ribs do not show Slight to no protrusion of the iliac crest</td>
</tr>
</tbody>
</table>
## Physical Assessment - Muscle

### Loss of Muscle Mass

<table>
<thead>
<tr>
<th>Exam Area</th>
<th>Tips</th>
<th>Severe Malnutrition</th>
<th>Mild-Moderate Malnutrition</th>
<th>Well Nourished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temple - Temporalis Muscle</td>
<td>View patient when standing directly in front of them, ask patient to turn head side to side</td>
<td>Hollowing, scooping, depression</td>
<td>Slight depression</td>
<td>Can see/feel well defined muscle</td>
</tr>
<tr>
<td>Clavicle Bone Region – Pectoralis Major, Deltoid, Trapezius Muscles</td>
<td>Look for prominent bone. Make sure patient is not hunched forward</td>
<td>Protruding, prominent bone</td>
<td>Visible in male, some protrusion in female</td>
<td>Not visible in male, visible but not prominent in female</td>
</tr>
<tr>
<td>Clavicle and Acromion Process – Deltoid Muscle</td>
<td>Patient arms at side; observe shape</td>
<td>Shoulder to arm joint looks square. Bones prominent. Acromion protrusion very prominent</td>
<td>Acromion process may slightly protrude</td>
<td>Rounded, curves at arm/shoulder/neck</td>
</tr>
<tr>
<td>Exam Area</td>
<td>Tips</td>
<td>Severe Malnutrition</td>
<td>Mild-Moderate Malnutrition</td>
<td>Well Nourished</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Scapular Bone Region – Trapezius, Supraspinus, Infraspinus Muscles</td>
<td>Ask patient to extend hands straight out, push against solid object</td>
<td>Prominent, visible bones, depression between ribs/scapula or shoulder/spine</td>
<td>Mild depression or bone may show slightly</td>
<td>Bones not prominent, no significant depressions</td>
</tr>
<tr>
<td>Dorsal Hand - Interosseous Muscle</td>
<td>Look at thumb side of hand; look at pads of thumb when tip of forefinger touching tip of thumb</td>
<td>Depressed area between thumb-forefinger</td>
<td>Slightly depressed</td>
<td>Muscle bulges, could be flat in some well nourished people</td>
</tr>
<tr>
<td>Patellar Region – Quadricep Muscle</td>
<td>Ask patient to sit with leg propped up bent at knee</td>
<td>Bones prominent, little sign of muscle around knee</td>
<td>Knee cap less prominent, more rounded</td>
<td>Muscles protrude, bones not prominent</td>
</tr>
<tr>
<td>Anterior Thigh Region - Quadriceps Muscles</td>
<td>Ask patient to sit, prop leg up. Grasp quads to differentiate muscle tissue from fat tissue</td>
<td>Depression/line on thigh, obviously thin</td>
<td>Mild depression on inner thigh</td>
<td>Well rounded, well developed</td>
</tr>
<tr>
<td>Post Calf Region – Gastrocnemius Muscle</td>
<td>Grasp the calf muscle to determine amount of tissue</td>
<td>Thin, minimal to no muscle definition</td>
<td>Not well developed</td>
<td>Well-developed bulb of muscle</td>
</tr>
</tbody>
</table>
Assessing Fluid Accumulation

- Chart review-disease process
- Intake/Output records
- Weight
- Physical exam-edema
- Ascites-check history, imaging studies
- Masks body compartment assessment (fat, muscle, weight)
- Use with caution when determining degree of malnutrition!
Assessment of Edema

ASSESSMENT OF PITTING EDEMA

<table>
<thead>
<tr>
<th>2mm or less = 1 + Edema</th>
<th>2-4mm = 2 + Edema</th>
<th>4-6mm = 3 + Edema</th>
<th>6-8mm = 4 + Edema</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Slight pitting</td>
<td>✓ Somewhat deeper pit</td>
<td>✓ Pit is noticeably deep</td>
<td>✓ Pit is very deep</td>
</tr>
<tr>
<td>✓ No visible distortion</td>
<td>✓ No readily detectable distortion</td>
<td>✓ May last more than 1 minute</td>
<td>✓ Lasts as long as 2-5 minutes</td>
</tr>
<tr>
<td>✓ Disappears rapidly</td>
<td>✓ Disappears in 10-15 seconds (2-4 mm indent)</td>
<td>✓ Dependent extremity looks fuller and swollen (4-6mm)</td>
<td>✓ Dependent extremity is grossly distorted (6-8mm)</td>
</tr>
</tbody>
</table>

http://www.med-health.net/Edema-Grading.html
Functional Markers

• Overall energy, strength, endurance
• Consider non-malnutrition causes
  – neuromuscular diseases, medication, age-related, trauma, activity/immobility
• Correlate with other characteristics (wt loss, intake)
• Ability to perform ADLs
• Ability to wean from mechanical ventilation
• Hand-grip strength – validated proxy for LBM\(^1\)
• Independent predictor of poor nutrition status\(^2\)

Questions
Application/Patient Cases
Patient Presentation - CB

• 59 year old male admitted from the Emergency Department with acute rectal bleeding
• Colonoscopy on hospital day (HD) # 3 revealed a partially obstructing mid-rectal mass suspicious for malignancy.
• HD #6, the patient underwent a lower anterior resection (colon) with anastomosis.
• Nutrition Risk Assessment
  – Admission nutrition screen: Malnutrition Screening Tool Score: 0
  – RD monitored patient during admission and completed further assessment on HD #7 due to NPO status
Patient Presentation - CB

Nutrition Presentation

- Anthropometrics
  - Height: 66 inches
  - Current weight: 263 #
  - Admission weight: 268 #
- Weight one months ago: 280# (per patient interview by RD)

Diet History

- NPO since admission
- Anorexia and reduced oral intake over last month – patient reported eating about half of his normal meal intake during same time period

Physical Assessment

- No evidence of subcutaneous fat or muscle loss
- Bilateral lower extremities: pitting edema: 2+
Patient Presentation - CB

Clinical Data
- White blood cells: 16 K
- Temperature: 99.9 F
- Albumin: 1.8 g/dL
- Prealbumin: 7.8 mg/dL

Functional Status
- Physical Therapy evaluation: generalized weakness on admission
What is Your Nutrition Diagnosis?

• **Weight loss:**
  – One month: 6%

• **Energy Intake**
  – No nutrient intake since hospital admission (seven days) – reduced intake over past month

• **Physical Assessment**
  – Moderate edema

• **Functional Assessment**
  – Generalized weakness – not part of current criteria

• **Severe malnutrition related to acute illness a/e/b**
  weight loss, inadequate intake and fluid accumulation
# Severe Malnutrition in Adults

*J Acad Nutr Diet. 2012;112(5): 730-738*

<table>
<thead>
<tr>
<th>For Example: ICD-9 Code 262*</th>
<th><strong>Acute Illness/Injury</strong></th>
<th><strong>Chronic Illness</strong></th>
<th><strong>Social/Environmental</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td><strong>&gt;2%/1 week</strong>&lt;br&gt;<strong>&gt;5%/1 month</strong>&lt;br&gt;<strong>&gt;7.5%/3 months</strong></td>
<td><strong>&gt;5%/1 month</strong>&lt;br&gt;<strong>&gt;7.5%/3 months</strong>&lt;br&gt;<strong>&gt;10%/6 months</strong>&lt;br&gt;<strong>&gt; 20%/1 year</strong></td>
<td><strong>&gt;5%/1 month</strong>&lt;br&gt;<strong>&gt;7.5%/3 months</strong>&lt;br&gt;<strong>&gt;10%/6 months</strong>&lt;br&gt;<strong>&gt; 20%/1 year</strong></td>
</tr>
<tr>
<td>Energy Intake</td>
<td><strong>&lt; 50% for ≥ 5 days</strong></td>
<td><strong>&lt; 75% for ≥ 1 month</strong></td>
<td><strong>&lt; 50% for ≥ 1 month</strong></td>
</tr>
<tr>
<td>Body Fat</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Muscle Mass</td>
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</tbody>
</table>

* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association
Patient Presentation - JS

- 60 yr male diagnosed with laryngeal cancer
  - s/p radical laryngectomy with esophageal reconstruction and grafting
  - Received enteral feeding X 6 days in hospital
  - Discharged to home health care on oral diet
  - Proceeds with adjuvant chemo and radiation therapy (6 week course)
- Ht: 5’, 10”, Current Wt: 140#, Usual Body Wt: 165# BMI 20
- Nutrition history
  - Reduced eating pre-op X 1 month due to dysphagia
    - Improved following surgery
  - Profound eating difficulty following chemo/radiation
    - Consuming only bites and sips of food
Patient Presentation - JS

- 25 # weight loss over past 3 months
  - 15% weight loss

- Physical Exam
  - Hollowed depression of temporal area
  - Visible clavicle
  - Very visible patella
  - No evidence of fluid accumulation

- Laboratory
  - Albumin: 2.8 g/dL
What is Your Nutrition Diagnosis?

- **Weight loss:**
  - Three months: 15%

- **Energy Intake**
  - Eating approximately half of normal food items over past month

- **Physical Assessment**
  - Severe loss of muscle and fat

- **Functional Assessment**
  - Generalized weakness – not part of current criteria

- **Severe malnutrition related to chronic disease**
  - a/e/b weight loss, inadequate intake and muscle loss
# Severe Malnutrition in Adults

*J Acade Nutr Diet. 2012;112(5): 730-738*

<table>
<thead>
<tr>
<th>For Example: ICD-9 Code 262*</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight Loss</strong></td>
<td>&gt;2%/1 week</td>
<td>&gt;5%/1 month</td>
<td>&gt;5%/1 month</td>
</tr>
<tr>
<td></td>
<td>&gt;5%/1 month</td>
<td>&gt;7.5%/3 months</td>
<td>&gt;7.5%/3 months</td>
</tr>
<tr>
<td></td>
<td>&gt;7.5%/3 months</td>
<td>&gt;10%/6 months</td>
<td>&gt;10%/6 months</td>
</tr>
<tr>
<td></td>
<td>&gt; 20%/1 year</td>
<td>&gt; 20%/1 year</td>
<td>&gt; 20%/1 year</td>
</tr>
<tr>
<td><strong>Energy Intake</strong></td>
<td>≤ 50% for ≥ 5 days</td>
<td>≤ 75% for ≥ 1 month</td>
<td>≤ 50% for ≥ 1 month</td>
</tr>
<tr>
<td><strong>Body Fat</strong></td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td><strong>Muscle Mass</strong></td>
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* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association
Patient Presentation - SB

- HR is a 78 year old female admitted with abdominal pain
  - 1- month history of pain, nausea and vomiting
  - Long history of gastric dysfunction with previous gastric surgeries
  - Patient underwent partial gastrectomy with revision of roux-en-y gastrojejunostomy
    - J tube placement

- Provided with TPN for 2 weeks pre-op due to severe malnutrition

- Height: 64”, Adm Weight: 98#

- Transitioned to EN 10 days post-op

- Ongoing EN intolerance issues with excessive stooling combined with nausea
  - Required 3-4 weeks to achieve goal maintenance energy requirements
Patient Presentation - SB

- Ongoing issues with abdominal abscesses
- Nutrition assessment two months after admission
- Weight: 90#
  - 8% loss

Physical Exam
- Evidence of moderate to severe fat and muscle loss
  - Orbital fat loss
  - Very visible clavicle and scapula
  - Very prominent knee bone

Clinical Parameters
- Normal WBC, afebrile, Albumin: 2.9 g/dL, Prealbumin 12 mg/dL
What is Your Nutrition Diagnosis?

• **Weight loss:**
  – 2 months: 8%

• **Energy Intake**
  – RD monitoring reports avg of 80%-90% of energy/protein requirements over past month

• **Physical Assessment**
  – Severe loss of muscle and fat

• **Functional Assessment**
  – Generalized weakness – not part of current criteria

• **Severe malnutrition related to chronic disease**
  – a/e/b weight loss and fat/muscle loss
Severe Malnutrition in Adults

J Acad Nutr Diet. 2012;112(5): 730-738

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* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association
Questions
Feasibility and Usability Evaluation

• Nicolo, et al, 2013

• Goals
  – Which criteria would be available at first nutrition assessment
  – Prevalence of severe and non-severe malnutrition
  – Determine patients considered by clinicians to be “at risk” for developing malnutrition
    • not meeting diagnostic criteria

• 101 consecutive patient referrals
  – 73 non ICU
  – 28 ICU

Feasibility and Usability Evaluation

• Nicolo, et al, 2013

  – Two participating facilities (n=163)
    • Patients referred to RD for assessment
    • Patients consulted for nutrition support

Table 5. Prevalence of Malnutrition Using Academy of Nutrition and Dietetics–American Society for Parenteral and Enteral Nutrition Recommended Clinical Characteristics.6

<table>
<thead>
<tr>
<th>Group</th>
<th>Not Malnourished With Acute Illness</th>
<th>Moderate Malnourished With Acute Illness</th>
<th>Severe Malnourished With Acute Illness</th>
<th>Not Malnourished With Chronic Illness</th>
<th>Moderate Malnourished With Chronic Illness</th>
<th>Severe Malnourished With Chronic Illness</th>
<th>Moderate Malnourished With Social-Environmental Circumstances</th>
<th>Severe Malnourished With Social-Environmental Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>73 (27.8)</td>
<td>17 (6.5)</td>
<td>20 (7.6)</td>
<td>79 (30.0)</td>
<td>32 (12.2)</td>
<td>29 (11.0)</td>
<td>2 (0.8)</td>
<td>1 (0.4)</td>
</tr>
<tr>
<td>HUP</td>
<td>21 (20.8)</td>
<td>4 (4.0)</td>
<td>3 (3.0)</td>
<td>42 (41.6)</td>
<td>13 (12.9)</td>
<td>16 (15.8)</td>
<td>1 (1.0)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>GMC</td>
<td>52 (71.2)</td>
<td>13 (8.6)</td>
<td>17 (11.2)</td>
<td>37 (24.3)</td>
<td>19 (12.5)</td>
<td>13 (8.6)</td>
<td>1 (0.7)</td>
<td>0</td>
</tr>
<tr>
<td>Non-ICU</td>
<td>0</td>
<td>0</td>
<td>2 (1.4)</td>
<td>79 (55.6)</td>
<td>30 (21.1)</td>
<td>28 (19.7)</td>
<td>2 (1.4)</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>ICU</td>
<td>73 (67.6)</td>
<td>17 (15.7)</td>
<td>18 (16.7)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Data are number (percentage). GMC, Geisinger Medical Center; HUP, Hospital of the University of Pennsylvania; ICU, intensive care unit.

## Feasibility and Usability Evaluation

### Malnutrition Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Entire Group (n=101)</th>
<th>Non-ICU (n=73)</th>
<th>ICU (n=28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Intake &lt; 50% usual</td>
<td>71 (31%)</td>
<td>19 (33%)</td>
<td>3 (21%)</td>
</tr>
<tr>
<td>Energy Intake &gt; 50% usual</td>
<td>49 (69%)</td>
<td>38 (66.7%)</td>
<td>11 (78.5%)</td>
</tr>
<tr>
<td>No Weight Loss</td>
<td>37 (46%)</td>
<td>29 (43%)</td>
<td>8 (68%)</td>
</tr>
<tr>
<td>1-5% Weight Loss</td>
<td>5 (6%)</td>
<td>3 (4%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>6-10% Weight Loss</td>
<td>37 (46%)</td>
<td>28 (40%)</td>
<td>9 (32%)</td>
</tr>
<tr>
<td>Loss of Fat Mass</td>
<td>27 (25%)</td>
<td>19 (28%)</td>
<td>5 (18%)</td>
</tr>
<tr>
<td>No Loss of Fat Mass</td>
<td>73 (75%)</td>
<td>50 (72%)</td>
<td>23 (82%)</td>
</tr>
<tr>
<td>Loss of Muscle Mass</td>
<td>33 (34%)</td>
<td>28 (41%)</td>
<td>5 (18%)</td>
</tr>
<tr>
<td>No Loss of Muscle Mass</td>
<td>63 (66%)</td>
<td>40 (59%)</td>
<td>23 (82%)</td>
</tr>
<tr>
<td>Edema</td>
<td>29 (32%)</td>
<td>28 (41%)</td>
<td>12 (46%)</td>
</tr>
<tr>
<td>No Edema</td>
<td>62 (68%)</td>
<td>48 (74%)</td>
<td>14 (54%)</td>
</tr>
</tbody>
</table>
Additional Practice Points

• Requires more extensive clinical review/intervention
  – Review of medical record
  – Patient/family interview
  – Physical assessment
  – 30-60 minutes
  – Verbal communication with MD
    • Especially when EN/PN is most likely intervention
Malnutrition Nomenclature

- **Nutrition Care Process**
- **Nutrition Diagnosis**  Severe Malnutrition in the context of acute illness and injury
- **Nutrition Problem Related To**  Small Bowel Obstruction
- **Nutrition Problem as Evidenced By**  Energy Intake: Less than or equal to 50% of estimated energy reqmts…, Weight Loss: Greater than 5% weight loss in 1 month.
### Nutrition Care Process

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3/28/14</td>
<td>Priority #1</td>
<td>Inadequate oral intake</td>
<td>&lt;MultiAlpha&gt;</td>
<td>Collaboration with team members for patient’s FCO; Recommend TF</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
<td>&lt;MultiAlpha&gt;</td>
</tr>
<tr>
<td>3/28/14</td>
<td>Priority #2</td>
<td>Severe Malnutrition in the context of acute illness and/or injury</td>
<td>&lt;MultiAlpha&gt;</td>
<td>Energy Intake Less than 70% of estimated energy intake compared to estimated energy needs for greater than or equal to 3 months. Physical Assessment Clues: Visible in male, some protrusion in female. Weight Loss: Greater than 10% in 1 month</td>
<td>Other: see above</td>
<td>Other: see above</td>
<td>Other: see above</td>
<td>Other: see above</td>
<td>Other: see above</td>
<td>Other: see above</td>
<td>Other: see above</td>
</tr>
</tbody>
</table>

**Notes:**
- *Prioritization and interventions should be adjusted based on the patient's current medical status and progress.*
- *Consult with the interdisciplinary team for specific recommendations.*

**In Progress**
Recent Malnutrition Activities
Nutrition Care Pathways

• Interactive step by step pathways
  – Adults and pediatrics
• From nutrition screening to transition of care
• Resource documents provided with various steps
  – Electronic links
• Provides ability to assess and evaluate malnutrition related processes
A Call To Action to Address Malnutrition

• Addressing Disease-related Malnutrition in Hospitalized Patients: A Call for a National Goal
  – Joint Commission Journal – October 2015

“It is not that disease-related malnutrition should be a “never event”, but absence of timely nutrition assessment, diagnosis, and implementation of a care plan in patients at risk for malnutrition or with preexisting malnutrition should be a “never event”.
Figure 2. Areas Prioritized for Malnutrition Quality Improvement and Measurement

- Execution of a Nutrition Care Plan
- Use of a Validated Nutrition Screening Tool
- Use of a Validated Nutrition Assessment Tool
- Muscle Wasting as an Undesirable Outcome
- Patient Satisfaction as an Outcome
- Malnutrition as a “Never Event”
- Workforce: Provision of Team-Based Care
- Use of an Electronic Health Record (EHR) Template
To Summarize

• Incorporating the Academy/A.S.P.E.N. Consensus will standardize diagnosis/documentation of malnutrition
  – Key step for determining national prevalence and designing intervention research

• Evaluating the presence and degree of inflammation is essential

• Provided key points for evaluating the 6 malnutrition characteristics

• Application via patient case discussion
Thank You!!
Questions
Credit Claiming

You must complete a brief evaluation of the program in order to download your certificate. The evaluation survey will be available on www.CE.TodaysDietitian.com for 1 year following the live presentation.

RDs should list CPE activity type 175 in their professional development portfolio.