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 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>Normally Nourished (SGA-A)</th>
<th>Moderately Malnourished (SGA-B)</th>
<th>Severely Malnourished SGA-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>46% (n=185)</td>
<td>31% (n=125)</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</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (n=185)</td>
<td>115</td>
<td>52</td>
<td>18</td>
</tr>
<tr>
<td>Moderate (n=125)</td>
<td>40</td>
<td>60</td>
<td>25</td>
</tr>
<tr>
<td>Severe (n=94)</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>45,767±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>

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 5. Comorbid Conditions of Discharged Patients With and Without a Diagnosis of Malnutrition, United States, 2010.

<table>
<thead>
<tr>
<th>Comorbid Condition</th>
<th>Malnutrition Diagnosis</th>
<th>No Malnutrition Diagnosis</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay (days)</td>
<td>12.0</td>
<td>12.1 (11.1)</td>
<td>.8 (.001)</td>
</tr>
<tr>
<td>Total costs (mean)</td>
<td>26,044</td>
<td>25,735 (25,035)</td>
<td>.2 (.033)</td>
</tr>
<tr>
<td>Admission type</td>
<td>Emergency</td>
<td>56.8</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>Urgent</td>
<td>19.6</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>17.4</td>
<td>.16</td>
</tr>
<tr>
<td>Newborn</td>
<td>2.2</td>
<td>1.9 (2.6)</td>
<td>.14</td>
</tr>
<tr>
<td>Trauma center</td>
<td>0.0</td>
<td>0.6 (0.4)</td>
<td>.04 (.04)</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>0.0%</td>
<td>.01 (.01)</td>
</tr>
<tr>
<td>Discharge disposition (%)</td>
<td>28.8</td>
<td>27.5 (29.0)</td>
<td>.01 (.01)</td>
</tr>
<tr>
<td>Transferred to short-term hospital</td>
<td>3.6</td>
<td>3.2 (3.8)</td>
<td>.04 (.04)</td>
</tr>
<tr>
<td>Other transfers</td>
<td>31.1</td>
<td>31.2 (31.5)</td>
<td>.08 (.08)</td>
</tr>
<tr>
<td>Stayed in own medical service</td>
<td>19.5</td>
<td>19.6 (20.6)</td>
<td>.08 (.08)</td>
</tr>
<tr>
<td>Discharged alive, destination unknown</td>
<td>4.8%</td>
<td>4.8 (5.4)</td>
<td>.8 (.8)</td>
</tr>
</tbody>
</table>

(Corkins et al., JPEN J Parenteral Enteral Nutr, 2014)

Malnutrition in the Surgical Patient

<table>
<thead>
<tr>
<th>Outcome</th>
<th>High risk group</th>
<th>No risk group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>22 (33.1%)</td>
<td>64 (66.9%)</td>
<td>NS</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>17 (33.1%)</td>
<td>35 (64.6%)</td>
<td>NS</td>
</tr>
<tr>
<td>Admission emergency (verified)</td>
<td>22 (68.8%)</td>
<td>34 (53.1%)</td>
<td>.3</td>
</tr>
<tr>
<td>Morbidity (syndrome)</td>
<td>14 (43.7%)</td>
<td>12 (18.7%)</td>
<td>.02</td>
</tr>
<tr>
<td>Surgery performed</td>
<td>19 (58.6%)</td>
<td>36 (55.8%)</td>
<td>.06</td>
</tr>
<tr>
<td>LOS (days)</td>
<td>16.8 ± 3.15</td>
<td>7 ± 5.5</td>
<td>.001</td>
</tr>
<tr>
<td>Nutritional therapy</td>
<td>26.0%</td>
<td>7.9%</td>
<td>.2</td>
</tr>
<tr>
<td>Mortality</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>11 (11.6%)</td>
<td>.006</td>
</tr>
<tr>
<td>Cumulative 12 months</td>
<td>7 (23.3%)</td>
<td>11 (11.6%)</td>
<td>.002</td>
</tr>
</tbody>
</table>

(Ben-Ishay et al, Gastroenterol Res Pract, 2011)
Clinical Practice – Coding for Malnutrition

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

(From: Corkins et al, JPEN J Parenter Enteral Nutr, 2014)

A New Approach to Defining Malnutrition

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)

(From: White et al, JPEN J Parenter Enteral Nutr, 2012)

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.

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)
  - Acute Disease or Injury-Related Malnutrition (major infection, burn, 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, fibrinogin\(^1\) 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


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
### 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>Orbital Region</td>
<td>Have patient when standing directly in front of them; touch above cheekbone</td>
<td>Hollow look, depressions, dark circles, loose skin</td>
<td>Slightly depressed; dark circle may mask loss</td>
<td>Slightly bulged for pads; fluid retention may mask loss</td>
</tr>
<tr>
<td>Upper Arm Region – Tripeps/Brachial Region</td>
<td>Arm bent, roll fist between fingers, do not include muscle in pinch</td>
<td>Very little space between folds, fingers touch</td>
<td>Some depth pinch but no angle; more fluid retention</td>
<td>Ample fat tissue, obvious between folds of skin</td>
</tr>
<tr>
<td>Thoraic and Lumbar Region – Rib, Lower Back, Midaxillary Line</td>
<td>Have patient press forehead against a solid object</td>
<td>Depression between ribs very apparent; iliac crest very prominent; ribs; depression between ribs less pronounced</td>
<td>Ribs apparent; depression between ribs less pronounced; iliac crest somewhat prominent</td>
<td>Chest is flat; ribs do not show; slight to no prominence of the iliac crest</td>
</tr>
</tbody>
</table>

The Academy of Nutrition and Dietetics, 2015, Nutrition Care Manual

### Physical Assessment - Muscle

<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 Muscles</td>
<td>Have patient when standing directly in front of them; ask patient to turn head side to side</td>
<td>Hollowing, scooping, depression</td>
<td>Eight depression</td>
<td>Can see 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>Prominent, visible 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 – Deltoide Muscle</td>
<td>Patient arms at side; observe shape</td>
<td>Prominent, visible bones, depression between ribs/scapula or shoulder/neck</td>
<td>Prominent; Acromion process may slightly protrude</td>
<td>Rounded, curves at arm/humeral/rear</td>
</tr>
<tr>
<td>Scapular Bone Region – Trapezius, Supraspinatus, 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/neck</td>
<td>Prominent; bone may show slightly</td>
<td>Does 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>Prominent, visible bones, depression between ribs/forefinger</td>
<td>Slightly depressed</td>
<td>Muscles bulges, could be flat in some well nourished people</td>
</tr>
<tr>
<td>Hip Calf Region – Gastrocnemius Muscle</td>
<td>Grasp the calf muscle to determine amount of tissue</td>
<td>Thin, minimal to no muscle definition; depression on inner thigh, obviously thin</td>
<td>Slightly depressed</td>
<td>Well-developed, well-developed</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

http://www.medehealth.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
- Independent predictor of poor nutrition status

Questions

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+

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

For Example:
ICD-9 Code 262*

<table>
<thead>
<tr>
<th>Weight Loss</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2%/1 week</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>&gt;5%/1 month</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>&gt;7.5%/3 months</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Intake</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50% for 5 days</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>&lt;75% for 1 month</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>&lt;50% for 1 month</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body Fat</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Muscle Mass</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluid Accumulation</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Moderate</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grip Strength</th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Recommended in ICU</td>
<td>Reduced for Age/Anatom</td>
<td>Reduced for Age/Anatom</td>
<td>Reduced for Age/Anatom</td>
</tr>
</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

For Examples: ICD-9 Code 262* 42

<table>
<thead>
<tr>
<th></th>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td>10% or less</td>
<td>&gt;7% 1 week</td>
<td>&gt;15% 3 months</td>
</tr>
<tr>
<td></td>
<td>&gt;7% 1 month</td>
<td>&gt;20% 1 year</td>
<td>&gt;20% 1 year</td>
</tr>
<tr>
<td>Energy Intake</td>
<td>&lt;50% for ≥ 2 days</td>
<td>75% for ≥ 1 month</td>
<td>50% for ≥ 1 month</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>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Fluid Accumulation</td>
<td>Moderate – Severe</td>
<td>Severe</td>
<td>Severe</td>
</tr>
<tr>
<td>Grip Strength</td>
<td>Not Recommended in ICU</td>
<td>Reduced for Age/Gender</td>
<td>Reduced for Age/Gender</td>
</tr>
</tbody>
</table>

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

### Patient Presentation - SB

- **HR is a 76 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

<table>
<thead>
<tr>
<th>Acute Illness/Injury</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Fat</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Muscle Mass</td>
<td>Moderate Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Fluid Accumulation</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Grip Strength</td>
<td>Not Recommended in ICU</td>
<td>Reduced for Age/Gender</td>
</tr>
</tbody>
</table>

* 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, 2013¹
  – Two participating facilities (n=163)
  • Patients referred to RD for assessment
  • Patients consulted for nutrition support

<table>
<thead>
<tr>
<th>Group</th>
<th>Malnutrition With Acute Illness</th>
<th>Malnutrition With Chronic Illness</th>
<th>Severe Malnutrition With Acute Illness</th>
<th>Severe Malnutrition With Chronic Illness</th>
<th>Moderate Malnutrition With Social/Environmental Circumstances</th>
<th>Severe Malnutrition With Social/Environmental Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEP</td>
<td>21 (32.3)</td>
<td>4 (6.9)</td>
<td>8 (12.6)</td>
<td>10 (15.6)</td>
<td>2 (3.2)</td>
<td>3 (4.7)</td>
</tr>
<tr>
<td>ICU</td>
<td>21 (31.5)</td>
<td>4 (6.6)</td>
<td>8 (12.2)</td>
<td>10 (15.2)</td>
<td>2 (3.2)</td>
<td>3 (4.7)</td>
</tr>
<tr>
<td>Non-ICU</td>
<td>6 (19.6)</td>
<td>0 (0)</td>
<td>2 (6.8)</td>
<td>1 (3.1)</td>
<td>1 (3.2)</td>
<td>1 (3.2)</td>
</tr>
</tbody>
</table>

¹ Data are number (percentage). HEP: Hematology and Oncology. ICU: Hospital for the University of Pennsylvania ICU; intensive care unit.

Feasibility and Usability Evaluation

<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 (76.9%)</td>
</tr>
<tr>
<td>No Weight Loss</td>
<td>37 (46%)</td>
<td>29 (43%)</td>
<td>8 (69%)</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 (27%)</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/or 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.
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".

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.