Disclosure

- I have nothing to disclose

Objectives

- Outline the prevalence of hospital related malnutrition and its impact on outcomes
- Review the Academy of Nutrition and Dietetics/A.S.P.E.N. Consensus Criteria for diagnosing malnutrition and describe the process for implementing in hospital settings
- Describe the opportunities for success in malnutrition documentation

Malnutrition – Not a New Issue

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

HIRAM O. STUDLEY

Landmark Publication

The Skeleton in the Hospital Closet

I suspect, as a matter of fact, that one of the largest pockets of unrecognized malnutrition in America exists not in rural slums or urban ghettos, but in the private rooms and wards of big city hospitals.

Nutr Today 1979; 9:4-8

Malnutrition Remains a Problem Today

“Malnutrition continues to go unrecognized and untreated in many hospitalized patients”

“The key is to systematically identify patients who are malnourished or at risk and to promptly intervene”

Malnutrition Prevalence

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Definition</th>
<th>Severe</th>
<th>Moderate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 Acute</td>
<td>Acute care hospital</td>
<td>ASPEN Academy</td>
<td>19%</td>
<td>19.4%</td>
<td>38.4%</td>
</tr>
<tr>
<td>2015 Acute</td>
<td>Acute care hospital (pilot)</td>
<td>ASPEN Academy</td>
<td>33%</td>
<td>19%</td>
<td>52%</td>
</tr>
<tr>
<td>2016* Ambulatory oncology</td>
<td>ASPEN Academy</td>
<td>24%</td>
<td>4%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>2016* Head and neck cancer</td>
<td>ASPEN Academy</td>
<td>n/a</td>
<td>n/a</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>2016* Critically ill</td>
<td>ASPEN Academy</td>
<td>n/a</td>
<td>n/a</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>2016* Pancreatic surgery</td>
<td>ASPEN Academy</td>
<td>25.8%</td>
<td>30.2%</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>2016* Pediatric – acute care hospitals (pilot)</td>
<td>ASPEN Academy</td>
<td>12%</td>
<td>12%-mod 17%-mod</td>
<td>41%</td>
<td></td>
</tr>
</tbody>
</table>

* CNW Abstract

Malnutrition and Outcomes
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

Malnutrition Characteristics

Table 4. Admission vs Discharge Characteristics of Patients with and without a Diagnosis of Malnutrition, United States, 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>Length of stay (mean days)</td>
<td>12.4</td>
<td>8.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Admission TPN (%)</td>
<td>20.6</td>
<td>26.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Urgent</td>
<td>0.8</td>
<td>1.0</td>
<td>1.0 (NS)</td>
</tr>
<tr>
<td>Nasal</td>
<td>17.4</td>
<td>17.4</td>
<td>1.0 (NS)</td>
</tr>
<tr>
<td>Nasal</td>
<td>2.2</td>
<td>2.3</td>
<td>1.0 (NS)</td>
</tr>
<tr>
<td>Transient</td>
<td>0.2</td>
<td>0.1</td>
<td>1.0 (NS)</td>
</tr>
<tr>
<td>Transfer</td>
<td>0.5</td>
<td>0.6</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Discharge diagnosis (%)</td>
<td>5.0</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Unphysician visit (%)</td>
<td>20.0</td>
<td>26.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unphysician visit (%)</td>
<td>20.0</td>
<td>26.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Emergency transfer (%)</td>
<td>1.8</td>
<td>3.0</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Referral hospital (%)</td>
<td>1.8</td>
<td>3.0</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Malnutrition and Length of Stay

- Observational evaluation to validate methodologies in predicting inpatient LOS
- 2 year study in a Portuguese teaching hospital
- Methodologies
  - Academy/A.S.P.E.N.
  - PG-SGA
  - NRS 2002
  - MUST
- Through hazard analysis (unadjusted and adjusted), all methodologies found to be valid in predicting a longer hospital LOS

Malnutrition and Readmissions

- Australian prospective study to identify factors associated with 6 month unplanned readmission
  - medical patients (n=144)
  - 55 participants (38.7%) with an unplanned hospital admission within 6 months


US general surgical patients (n=1445)
- 163 (11.3%) readmitted within 30 days


Malnutrition and Readmissions

- Retrospective 2 year observational trial of US medical patients
- Urban academic medical center
- 10,359 admissions
  - 1762 patients (17%) readmitted within 30 days
- Significantly more re-admitted patients with weight loss
  - 8.7% vs 6.8% (p=0.0449)


Malnutrition and Mortality

- Evaluation of a Veterans Administration population
  - Sepsis, respiratory disease, cancer, gastrointestinal
  - N=404
- Utilized ASPEN/Academy malnutrition characteristics

Hiller L, JPEN 2016; epub ahead of print
2013 NIS data

- 1.95 million hospital stays that involved malnutrition (7.1% of nonmaternal, non-neonatal hospital stays)
- Highest category was protein-calorie malnutrition at 1.25 million or 64%

### Table: Prevalence of Nutritional Assessment and Support in Hospitalized Patients

<table>
<thead>
<tr>
<th>Diagnosis年</th>
<th>Prevalence of Nutritional Assessment</th>
<th>Support for Malnutrition Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>42%</td>
<td>34%</td>
</tr>
<tr>
<td>Diabetic</td>
<td>45%</td>
<td>31%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>32%</td>
<td>27%</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>28%</td>
<td>23%</td>
</tr>
<tr>
<td>Stroke</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Cancer</td>
<td>20%</td>
<td>15%</td>
</tr>
</tbody>
</table>

### Malnutrition and Principle Diagnoses

- Longer Hospital Stays
- Most hospital stays were 2x longer
- 47%-71% of patients with malnutrition did not have a routine discharge

- Human Cost
- Most malnutrition-related stays have a substantially higher proportion of in-hospital deaths
- 1.5x to 5x higher than those unrelated to malnutrition

AHRQ Statistical Brief #210;2016
Malnutrition Statistical Brief - Readmissions

- Statistical brief evaluating malnutrition and readmissions
- Compared readmissions in patients with malnutrition in their "index" admission vs those without malnutrition

<table>
<thead>
<tr>
<th>Presence of malnutrition</th>
<th>Average cost of index admission, $</th>
<th>Average cost of readmission, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any malnutrition (n=271,160)</td>
<td>21,200</td>
<td>13,390</td>
</tr>
<tr>
<td>No malnutrition (n=1,383,380)</td>
<td>12,100</td>
<td>13,420</td>
</tr>
</tbody>
</table>

- Septicemia most frequent diagnosis for re-admitted patients with malnutrition in their index stay
- Pneumonia and congestive heart failure common in malnourished readmitted patients and not for those without malnutrition

A New Approach to Defining Malnutrition

Etiology Based Malnutrition Definitions

Nutritional Risk Identified

Inflammation present? No / Yes

Starvation Related Malnutrition (pure chronic starvation, anorexia nervosa)

Chronic Disease Related Malnutrition (organ failure, pancreatic cancer, rheumatoid arthritis, sarcopenic obesity)

Acute Disease or Injury Related Malnutrition (major infection, burns, trauma, closed head injury)
Academy of Nutrition and Dietetics/A.S.P.E.N.
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

JPEN 2012; 36:275-283

Non-Severe Malnutrition in Adults

<table>
<thead>
<tr>
<th></th>
<th>Acute Illness/Iry</th>
<th>Chronic Illness</th>
<th>Social/Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2% over 7 days</td>
<td>&lt; 75% for &gt; 7 days</td>
<td>&lt; 75% for &gt; 1 month</td>
<td>&lt; 75% for &gt; 1 months</td>
</tr>
<tr>
<td>Energy Intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 1% for 1 week</td>
<td>&gt; 10% for &gt; 1 week</td>
<td>&gt; 15% for &gt; 1 month</td>
<td>&gt; 20% for &gt; 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 Depletion</td>
<td>Severe Depletion</td>
<td>Severe Depletion</td>
</tr>
<tr>
<td>Grip Strength</td>
<td>Not Applicable</td>
<td>Reduced for Age/Gender</td>
<td>Reduced for Age/Gender</td>
</tr>
</tbody>
</table>

Why Not Serum Albumin/Visceral Proteins?

- Body down regulates albumin synthesis so that needed proteins for immune, clotting, and wound healing functions can be made
  - **Positive** - antibodies, complement, C-reactive protein, and fibrinogen
  - **Negative** - albumin, transferrin, prealbumin, retinol binding protein

- Malnourished individuals (pure semi-starvation) likely will exhibit normal visceral proteins (anorexia nervosa)
- Any degree of inflammation will down-regulate visceral protein synthesis

Jensen GL. JPEN 2009;33:37-138
Nutrition Care Pathway - Adult

• Underlying philosophy to “raise the bar” in identifying malnourished patients
• Consistent with recommendations in Joint Commission Journal paper
• Nutrition assessment completed within 24 hours of consult
• If negative admission screen, rescans should occur every 3-7 days

Nutrition Intervention - Adult

• If malnutrition present, nutrition care plan with goals and intervention recommendations essential
  – Optimize oral intake
  – Oral nutrition supplements if appropriate
  – Enteral or parenteral nutrition per indication
• Communication with health care provider is essential

Performance Improvement in Malnutrition Processes

• Indicators specific to various pathway steps
• Identify improvement opportunities
• Available in spreadsheet format

Nutrition Screening and Assessment Survey 2012

<table>
<thead>
<tr>
<th>Answer/Option</th>
<th>ResponsePercent</th>
<th>ResponseCount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>38.5%</td>
<td>656</td>
</tr>
<tr>
<td>No</td>
<td>30.4%</td>
<td>519</td>
</tr>
<tr>
<td>SkippedQuestion</td>
<td>31.1%</td>
<td>531</td>
</tr>
</tbody>
</table>

Does your hospital use one or more validated nutrition SCREENING tools?

AnsweredQuestion: Yes
ASPEN Nutrition Assessment Survey 2016

- Do you utilize the Academy of Nutrition and Dietetics (AND)/A.S.P.E.N. Consensus Malnutrition Characteristics for nutrition assessment?
  - Yes – 321 or 86.67%
  - No – 48 or 13.33%
- If no, what assessment tool "do you use"?
  - Subjective global assessment – 22.9%
  - Mini-nutritional assessment – 7.4%
  - Self developed – 53%
  - Other – 16.7
    - Pressure ulcers, BMI, MST and clinical questions, etc

ASPEN Nutrition Assessment Survey - 2016

- 787 US ASPEN members participated (n=498)
- Nutrition Assessment variables utilized (n=307)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual body weight</td>
<td>94.02%</td>
<td>283</td>
</tr>
<tr>
<td>Ideal body weight</td>
<td>86.38%</td>
<td>260</td>
</tr>
<tr>
<td>BMI</td>
<td>93.36%</td>
<td>281</td>
</tr>
<tr>
<td>Assessment of fat loss</td>
<td>45.80%</td>
<td>132</td>
</tr>
<tr>
<td>Assessment of muscle loss</td>
<td>45.51%</td>
<td>132</td>
</tr>
<tr>
<td>Presence of edemas</td>
<td>73.3%</td>
<td>222</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td>31.89%</td>
<td>95</td>
</tr>
<tr>
<td>Skin Assessment</td>
<td>76.7%</td>
<td>215</td>
</tr>
<tr>
<td>Signs of vitamin/mineral deficiency</td>
<td>52.42%</td>
<td>156</td>
</tr>
</tbody>
</table>

Malnutrition Process

- Nutrition screening and assessment
- RD determines if malnutrition is present and degree.
- Notifies MD of malnutrition and supporting criteria
- MD documents malnutrition and severity in progress note
- Coders translate diagnosis into the corresponding ICD code

New York-Presbyterian Hospital Process

Mt. Carmel Health Malnutrition Process Implementation

- Developed an “Implementation Team”
  - Clinical Nutrition leaders
  - Medical Staff
  - Nursing
  - Finance
  - Documentation Specialists/Coders
  - Information System
  - Quality Management

Develop Implementation Plan

- Outlined nutrition assessment process
  - Adult malnutrition characteristics are standardized
- Formal and informal education of RDN’s
  - Use of characteristics
  - Nutrition focused physical assessment
- Specify documentation nomenclature in electronic health record
- Develop education plan
  - Medical staff
  - Documentation specialists
  - Coders

Malnutrition Process Work Flow

- Nutrition Screening by Patient Care Services upon admission
  - MST – score of ≥ 2 generates referral
- RDN assesses patient
- RDN reviews malnutrition findings with MD
  - Collaborates on documentation and plan of care
- RDN enters “Nutrition” malnutrition diagnosis in electronic health record

Malnutrition Diagnosis
Malnutrition Process Workflow

- MD is alerted and, if agrees, converts to “Medical” Diagnosis
  - Includes in progress notes
- Daily report generated from EHR of patients with malnutrition documentation by RDN
  - Used by documentation specialists for queries
- Upon discharge, coders review medical record and assign ICD malnutrition code

Malnutrition Documentation

Clinical Practice – Coding for Malnutrition

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

Coding for Malnutrition Improvement Needed

- Aim: to determine frequency of use of ICD-9 codes in a population of malnourished patients
- 1371 patients
- SGA performed
- Discharge ICD-9 code assignment reviewed
- 441 patients with SGA-B or C
  - 32% malnourished
  - 40 patients (9%) with malnutrition codes upon discharge

Corkins M R et al. JPEN 2013;0148607113512154

Lach K. CNW Abstract 56, 2014
**Coding for Malnutrition – Improvement Needed**

<table>
<thead>
<tr>
<th>ICD-9 Code</th>
<th>Code Detail</th>
<th># of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>260</td>
<td>Kwashiorkor</td>
<td>0</td>
</tr>
<tr>
<td>261</td>
<td>Nutritional marasmus</td>
<td>3</td>
</tr>
<tr>
<td>262</td>
<td>Other severe malnutrition</td>
<td>0</td>
</tr>
<tr>
<td>263.0</td>
<td>Malnutrition of a moderate degree</td>
<td>0</td>
</tr>
<tr>
<td>263.1</td>
<td>Malnutrition of a mild degree</td>
<td>1</td>
</tr>
<tr>
<td>263.9</td>
<td>Unspecified protein calorie malnutrition</td>
<td>5</td>
</tr>
<tr>
<td>780.54</td>
<td>Early satiety</td>
<td>1</td>
</tr>
<tr>
<td>780.5</td>
<td>Anorexia</td>
<td>6</td>
</tr>
<tr>
<td>783.21</td>
<td>Loss of weight</td>
<td>1</td>
</tr>
<tr>
<td>783.22</td>
<td>Underweight</td>
<td>1</td>
</tr>
<tr>
<td>783.7</td>
<td>Adult Failure to Thrive</td>
<td>8</td>
</tr>
<tr>
<td>785.4</td>
<td>Cachexia</td>
<td>1</td>
</tr>
</tbody>
</table>

**Malnutrition and Reimbursement**

- **Aim:** evaluate impact of documentation and malnutrition coding on casemix funding
- **SGA used for assessment**
- **658 patients screened with 105 (16%) malnourished**
- **DRG changed in 24 of the 105 episodes**
- **Only 29 of the 105 malnourished patients were coded and received increased reimbursement**
  - **Resulted in estimated lost revenue of $US12,710**

**Coding and Reimbursement**

**Malnutrition Documentation**

- **Chart review from large academic center**
- **N=217 patients with community acquired pneumonia over 13 months**
- **15/217 with RD malnutrition diagnosis (7%)**
- **8 of the 15 were coded upon discharge**
  - **DRG relative weight increased for 8 of the 8 patients**
  - **$18,875 increased revenue**
- **7 of the 15 were not coded upon discharge**
  - **Missed revenue of $29,813**
  - **CMI would have increased**

---

*Phillips W. Pract Gastro; Sept 2014*

- Survey on current practices and perceived barriers
- 652 respondents of 2718 members surveyed
  - 66% adult and 24% adult/peds
- 79% of RDN’s diagnose malnutrition
- 74% use the ASPEN/AND consensus criteria
- Respondents indicated 89% of primary care providers diagnosing malnutrition
  - Only 28% are using the ASPEN/AND criteria
- 78% of respondents indicted 78% of healthcare facilities are coding for malnutrition
  - Barriers include lack of PCP diagnosis, incorrect code selection, lack of NFPE training and disagreement of diagnosis between disciplines

Dobak S. ASPEN Clinical Nutr Week Abstract 2017

In Summary

- Malnutrition has been an issue for over 40 years
- Outcomes can be improved with diagnosis and intervention
- Developing processes for identification and treatment beneficial
- Appropriate documentation for coding and reimbursement is essential to provide adequate resources
- This is a critical opportunity for RDN’s to impact our patients and health care systems