Identifying and Treating Malnourished Patients to Improve Outcomes

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Defining Malnutrition

“Malnutrition is a subacute or chronic state of nutrition in which a combination of varying degrees of over- or under-nutrition and inflammatory activity have led to a change in body composition and diminished function”

The Prevalence of Malnutrition

Malnutrition causes adverse effects on body function and clinical outcome\(^1\) and can occur at any BMI, such as:

Because everyone has the potential to be affected by malnutrition, it is important to screen all patients.
Nutrition Day

- A worldwide initiative to identify malnutrition in hospitals
- Started in 2004 in Europe. United States starting participating in 2009
- One day submission of nutrition data that allows calculation of MST score and shows snapshot of oral intake
- 64 countries, 7000 hospitals, >240,000 pts
Nutrition Day

- For the US, data has been analyzed for 2009-2015
- 9,959 patients from 245 hospitals
- Prevalence of malnutrition (MST 2 or >) was estimated 32.7%
Importance of Adequate Nutrient Intake

• Adequate intake of both macronutrients (protein/amino acids, fat, carbohydrate and calories) and micronutrients (essential vitamins, minerals and trace elements) are critical for:
  • Optimal cell function
  • Immunity
  • Organ function
  • Muscle function and strength
  • Wound healing
Inadequate Intake and link to 30 Day Mortality

- Nutrition Day Data
- 36% of patients consumed all their meals
- 25% ate a quarter of their meals
- 7% were not allowed to eat
- 7% consumed nothing despite being allowed
- Patients who did not eat despite permission had a mortality HR of 5.99 compared to those who ate all their meals
- Patients who had 25% to eat had a mortality HR of 3.24
Burden of Malnutrition

- The importance of identifying at-risk patients is highlighted by data showing that malnutrition is associated with many adverse outcomes:

Malnutrition is More Important Than Ever

Hospitals face new challenges in quality patient care. Medicare and Medicaid will penalize hospitals for certain measures of patient quality care, such as:

- **Readmissions** within 30 days of discharge

- **Hospital-acquired conditions**, such as:
  - Pressure ulcers
  - Falls
  - Surgical-site infections
Financial Impact of Malnutrition

- Hospital costs for patients diagnosed with malnutrition are on average twice as high as non-malnourished patients.
- Average cost per readmission is 26% higher for patients with protein-calorie malnutrition.
- Patients with malnutrition may have longer LOS, up to 4-6 days.
What Clinicians Can Do

1. Recognize & diagnose all patients at risk of malnutrition
2. Rapidly implement appropriate nutritional interventions & monitor progress
3. Develop a discharge plan for patient nutrition care & education
Recognizing Malnutrition

- In 1996, Joint Commission required nutrition screening within 24 hours of admission (this is a must)
- One barrier is that malnutrition screening is often done “visually”
- It is critical to use a validated screening tool, e.g.,
  - Malnutrition Screening Tool (MST)
  - Mini Nutritional Assessment-Short Form (MNA-SF)
  - Malnutrition Universal Screening Tool (MUST)
  - Nutritional Risk Screening 2002 (NRS-2002)
  - Short Nutritional Assessment Questionnaire (SNAQ®)
Example Screening Tool: MST

1. Have you lost weight recently without trying?
   - No 0
   - Unsure 2

   If Yes, how much weight (kg) have you lost?
   - 1 – 5 1
   - 6 – 10 2
   - 11 – 15 3
   - > 15 4
   - Unsure 2

   Weight Loss Score: 

2. Have you been eating poorly because of a decreased appetite?
   - No 0
   - Yes 1

   Appetite Score: 

Total MST Score (weight loss + appetite scores): 

Example Screening Tool: MST

**STEP 1: Screen with the MST**

1. Have you recently lost weight without trying?
   - No: 0
   - Unsure: 2

2. If yes, how much weight have you lost?
   - 2-13 lb: 1
   - 14-23 lb: 2
   - 24-33 lb: 3
   - 34 lb or more: 4
   - Unsure: 2

**Weight loss score:**

3. Have you been eating poorly because of a decreased appetite?
   - No: 0
   - Yes: 1

**Appetite score:**

**Add weight loss and appetite scores**

**MST SCORE:**

**STEP 2: Score to determine risk**

- **MST = 0 OR 1**
  - NOT AT RISK
  - Eating well with little or no weight loss
  - If length of stay exceeds 7 days, then rescreen, repeating weekly as needed.

- **MST = 2 OR MORE**
  - AT RISK
  - Eating poorly and/or recent weight loss
  - Rapidly implement nutrition interventions. Perform nutrition consult within 24-72 hrs, depending on risk.

**STEP 3: Intervene with nutritional support for your patients at risk of malnutrition.**

**Notes:**

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Example Tool: MUST

BMI Score
- BMI >20.0 (>30 obese*) = 0
- BMI 18.5 - 20.0 = 1
- BMI <18.5 = 2

Weight Loss Score
(unplanned wt loss in 3-6 mo)
- Wt loss <5% = 0
- Wt loss 5-10% = 1
- Wt loss >10% = 2

Acute Disease Effect Score
Add a score of 2 if there has been or is likely to be no nutritional intake for >5 days

Add all scores

Overall Risk of Malnutrition and Management Guidelines

0
Low risk
Routine clinical care
- Repeat screening
  Hospital – weekly
  Care homes – monthly
  Community – annually for special groups (e.g., those > 75 y)

1
Medium risk
Observe
- Document dietary intake for 3 days if subject in hospital or care home
- If improved or adequate intake, little clinical concern; if no improvement, clinical concern – follow local policy
- Repeat screening
  Hospital – weekly
  Care home – at least monthly
  Community – at least every

2 or more
High risk
Treat*
- Refer to dietician, nutrition support team or implement local policy
- Improve and increase overall nutritional intake
- Monitor and review care plan
  Hospital – weekly
  Care home – monthly
  Community – monthly
- Unless detrimental or no benefit is expected from nutritional support a.g. imminent death
AND/A.S.P.E.N. Etiology-Based Definition of Malnutrition

Nutrition Risk Identified
Compromised intake or loss of body mass

Inflammation present?

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

- Yes
  - Mild to moderate
    - 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)

Diagnosing Malnutrition

• No single parameter is definitive for malnutrition; therefore, AND/A.S.P.E.N. proposed that malnutrition be diagnosed when at least two of the following six characteristics are identified:
  – 1) insufficient energy intake
  – 2) weight loss
  – 3) loss of subcutaneous fat
  – 4) loss of muscle mass
  – 5) localized /generalized fluid accumulation that may sometimes mask weight loss
  – 6) diminished functional status.

• The magnitude and temporal aspects of change among these dynamic characteristics can be used to distinguish between non-severe and severe malnutrition
Defining Malnutrition

Insufficient energy intake

↓ functional status

Weight loss

↓ muscle mass

↓ subcutaneous fat

↓ fluid accumulation

Adult Malnutrition (if ≥2 present)
## AND/A.S.P.E.N. Malnutrition Characteristics

<table>
<thead>
<tr>
<th>Clinical characteristic</th>
<th>Malnutrition in the context of acute illness or injury</th>
<th>Malnutrition in the context of chronic illness</th>
<th>Malnutrition in the context of social or environmental circumstances</th>
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<tr>
<td>(1) Energy intake: malnutrition is the result of inadequate food and nutrient intake or assimilation; thus, recent intake compared with estimated requirements is a primary criterion defining malnutrition. The clinician may obtain or review the food and nutrition history, estimate optimum energy needs, compare them with estimates of energy consumed, and report inadequate intake as a percentage of estimated energy requirements over time.</td>
<td>Moderate&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Severe&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Moderate&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>&lt; 75% of estimated energy requirement for &gt; 7 days</td>
<td>≤ 50% of estimated energy requirement for ≥ 5 days</td>
<td>&lt; 75% of estimated energy requirement for ≥ 1 month</td>
<td>≤ 75% of estimated energy requirement for ≥ 3 months</td>
</tr>
<tr>
<td>(2) Interpretation of weight loss: The clinician may evaluate weight in light of other clinical findings, including the presence of under- or over-hydration. The clinician may assess weight change over time reported as a percentage of weight lost from baseline. Physical findings: Malnutrition typically results in changes to the physical exam. The clinician may perform a physical exam and document any one of the physical exam findings below as an indicator of malnutrition.</td>
<td>% &lt; 2 Time 1 wk 1 mo 3 mo</td>
<td>% &gt; 2 Time 1 wk 3 mo</td>
<td>% &gt; 5 Time 1 wk 3 mo 6 mo 1 yr</td>
</tr>
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## AND/A.S.P.E.N. Malnutrition Characteristics (cont.)

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<td>(3) Body fat: Loss of subcutaneous fat (eg, orbital, triceps, fat overlying the ribs).</td>
<td>Mild</td>
<td>Moderate</td>
<td>Mild</td>
</tr>
<tr>
<td>(4) Muscle mass: Muscle loss (eg, wasting of the temples, clavicles, shoulders, interosseous muscles, scapula, thigh, and calf).</td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>(5) Fluid accumulation: The clinician may evaluate generalized or localized fluid accumulation evident on exam (extremities, vulvar/scrotal edema, or ascites). Weight loss is often masked by generalized fluid retention (edema), and weight gain may be observed.</td>
<td>Mild</td>
<td>Moderate to severe</td>
<td>Severe</td>
</tr>
<tr>
<td>(6) Reduced grip strength: Consult normative standards supplied by the manufacturer of the measurement device.</td>
<td>NA</td>
<td>Measurably reduced</td>
<td>Measurably reduced</td>
</tr>
</tbody>
</table>

Intervening with Nutritional Therapy

Once a patient is diagnosed malnourished or at risk, hospitalists and other health care professionals should rapidly implement nutrition interventions and continue monitoring your patients.
Types of Nutritional Interventions

- Nutrition intervention encompasses a broad spectrum of options, including:
  - Dietary modifications and counseling
  - Complete oral nutritional supplements
  - Specific oral supplements providing protein or calories alone
  - Complete multivitamin-trace element pills
  - Enteral nutrition (EN; e.g. tube feeding)
  - Parenteral nutrition (PN)
Do we intervene?

- Nutrition Day data
- Patients that were allowed to eat but did not -> 14.7% received ONS or artificial nutrition
- Similar data for patients who ate 25% of their meals -> 13.8% received ONS or artificial nutrition
- May reflect poor recognition of patients who are eating poorly and missed opportunities for intervention
Efficacy of Oral Nutritional Supplementation (ONS)

- Available data, mostly in patients age ≥ 65 + malnutrition
  Possible benefits of ONS in reducing readmission rates, LOS, pressure ulcers, total complications, 90 day mortality

- Variable reduction in hospital readmissions\(^1\)-\(^2\)

- Reduction in hospital length of stay (determined in quality improvement studies, not RCTs)\(^3\)-\(^4\)

- Up to 25% reduction in pressure ulcer incidence (meta-analysis)\(^5\)

- A 14% reduction in complications (meta-analysis)\(^6\)

- A decrease in 90 day mortality in older adults with malnutrition (RCT)\(^7\)

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Data Regarding Oral Nutritional Supplementation to Date

- Most studies have been small and have used variable methods with generally poor methodological quality.
- Generally no impact on patient mortality or functional outcomes, although suggestions of improved morbidity and mortality and improved functional outcomes when ONS given to patients with pre-existing malnutrition.
- Nutritional indexes (energy+protein intake, body weight, lean body mass) improve with ONS.
- Oral nutritional supplements provide essential nutrients (amino acids, essential fats, vitamins, mineral and trace elements, energy, protein) and are generally well tolerated.
- Rigorous, well-designed, and adequately powered RCTS evaluating specific formulations are needed in at-risk patient subgroups.
Barriers to Overcome

Barriers to ideal nutrition interventions are varied, but often include:

- NPO orders while patients await further assessments
- Inadequate food consumption due to poor appetite, disease processes, and interruptions to meal times
- Delay in assessment of nutrition status due to insufficient dietitian staffing
- Lack of nursing protocol orders for nutrition
- Dietitian recommendations not implemented due to the physician’s focus on other medical concerns
- Physician uncertainty with product formulary and/or specific micronutrient therapy options in their hospitals
Intervening with Nutrition Therapy

Collaborate with your care team to:

• Create supportive mealtime environment
• Develop procedures to provide patients with meals at “off times”
• Take notice of patient meal consumption
• Ensure patients receive all EN or PN as prescribed
• If indicated, provide ONS between meals; consider a multivitamin-trace element order during hospitalization
Intervening with Nutrition Therapy

- Avoid disconnecting EN or PN for patient repositioning, ambulation, travel or procedures

- Consider managing symptoms of gastrointestinal distress while continuing to administer PO diet or EN

- Take action to reduce amount of time patient’s intake is restricted

- Identify meds and disease conditions that interfere with nutrient absorption
Helping Patients Consume Food

• Make it as easy as possible for your patients to feed themselves or provide assistance

• Make sure tray/supplements are accessible

• Talk to your patients about the role nutrition plays in their recovery

• Monitor whether they have missed a meal
Educating Patients and Caregivers

- Lack of education among patients and their families
- Lack of “nutrition hand-off” to PCP’s and post-acute facilities
- It’s important for the care team to guide patients on

1. **Education**
   Provide instructions and education to patients upon discharge.

2. **Communication**
   Speak with your patients about the importance of nutrition and answer any questions about their nutritional paths.

3. **Compliance**
   Encourage patient compliance for continuous nutritional improvement.
Developing a Discharge Plan

- Nutrition care plan should be part of a comprehensive discharge process for all patients.

- Dietitians should be informed of discharge timing.

- Diet section of discharge instructions should provide a clear outline of the following:
  - Dietary needs
  - Calorie and protein goals; micronutrients
  - Successful hospital interventions
  - Goal for de-escalation of nutrition support (if indicated)
What You Can Do...

- Be aware of the nutritional status of your patients
- Ask screening questions when you admit or meet patients
- Look for the nutrition screening and assessments in the EHR
- Get to know your hospital dietitians; make them aware that you are reviewing their recommendations and want their professional input
- Gather data, e.g., calorie/protein counts, consumption of nutritional supplements, tube feed goals
- Incorporate nutrition into your daily rounds-notes, patient care huddles and conversations with patients/families
Specific examples – KUH

- Ordering privileges for RD’s→ ONS, calorie counts, weights, vitamins
- RD’s send note to attending physician via EMR→ malnutrition diagnosis with ICD code. Request that physician add to progress note and problem list
- RN’s have specific line in I/O documentation for ONS consumption
- Calorie count alert signs on patients’ doors
- Calorie count results flow to MD Rounds Report
Specific Examples Cont...

- Physician champion to discuss with other physicians difficult cases
- NPO over 72 hours triggers to RD
- Nutrition Support Service to assist in PN management and transition to enteral nutrition
- Enteral nutrition order set – mandatory use
- Volume – based enteral feeding protocol
Ideas moving forward..

- Calorie count results to automatically pull into daily notes
- RD’s participate in multidisciplinary team huddles
- Calorie and protein goals posted in patient’s room
- ONS listed in MARS to increase visibility
- Bedside RN can initiate ONS
- RD can initiate oral diet change or EN order change
- Discharge readiness check list in EMR– adequate po intake included
- RD’s to have access to discharge orders
In Conclusion...

- Nutrition is a core principle of recovery and wellness. Resist focusing on the battle and losing the war!

- Consider being a Physician Champion for your hospital. Optimal nutrition care is best achieved as a multidisciplinary effort

- Visit malnutrition.com for tools and resources
  - Malnutrition Quality Improvement Initiative (MQii)
    - Continuing education opportunities
    - Recent research studies on nutrition intervention
    - Insights and tools
    - Patient discharge materials
THANK YOU!!

QUESTIONS?