Nutrition and the Older Adult

Marion F. Winkler, PhD, RD, LDN, CNSC

Surgical Nutrition Specialist
Rhode Island Hospital
Associate Professor of Surgery
Alpert Medical School of Brown University
mwinkler@lifespan.org
Objectives

1. Recognize age-related changes in body composition.
1. Describe the significance of malnutrition in older adults.
1. Identify risk factors for malnutrition and mealtime difficulties.
1. Describe methods to screen and assess nutritional status.
1. Identify strategies to prevent unintended weight loss among older adults in all settings.
Age Related Body Composition

Fig. 2 Diagrammatic comparison of the effect of age on changes in body composition. Note the increased percentage of fat and reduction of body water in the 70-year-old person. This decrease reflects the age-associated decline in lean body mass. (Adapted from Schock et al. (1984).)
Sarcopenia

- Age-associated loss of skeletal muscle mass and function.
- Multifactorial causes:
  - Disuse
  - Altered endocrine function
  - Chronic diseases
  - Inflammation
  - Insulin resistance
  - Nutritional deficiencies
- Leads to disability, hospitalization, and death.

Patient Presentation

- Noted decline in function, strength, health status
  - Non-ambulatory; cannot rise from a chair unassisted
- Self-reported mobility-related difficulty
- History of recurrent falls
- Recent unintentional weight loss (> 5%)
- Post-hospitalization
- Other chronic conditions (diabetes, CHF, COPD, CKD, RA, cancer)

Sarcopenia

Evaluation
- Gait speed
- DEXA

Treatment
- Physical activity
- Nutritional therapies
- Androgen therapy
- Behavioral strategies
- Pharmacological strategies
  - (anti-sarcopenia agents)

Malnutrition

- Any disorder of nutrition status resulting from:
  - Deficiency of nutrient intake
  - Impaired nutrient metabolism
  - Over nutrition
- Altered body composition
- Altered nutrient dependent function
“Classical” Clinical Syndromes

Marasmus
- Energy deficiency
- Generalized muscle wasting
- Absence of subcutaneous fat

Kwashiorkor
- Protein deficiency
- Soft, pitting, painless edema
Adult Malnutrition

- “Stress hypoalbuminemia” – Cytokine mediated response to stress or injury, that alters synthetic and catabolic rates for proteins/acute phase reactants. *These patients may not look malnourished but they have hypoalbuminemia and increased total body edema.*

- In adults it is important to distinguish between malnutrition caused by uncomplicated starvation, obesity, and malnutrition and that caused by disease and trauma.
Consequences of Malnutrition

- Decreased productivity
- Increased risk of infection
- Poor wound healing
- Higher medical costs
- Longer length of hospitalization
- Greater risk of death
Diagnosing Malnutrition

Nutritional risk identified. Compromised intake or loss of body mass

Inflammation present? No/Yes

NO
Starvation-Related Malnutrition

YES
Mild to Moderate Degree Chronic-Disease Related Malnutrition

YES
Marked Inflammatory Response
Acute Disease or Injury-Related Malnutrition

Jensen GL et al. JPEN 2010;34:156-159.
In U.S., 30-50% of patients will be malnourished at admission to hospital.

69% will have a decline in nutrition status during hospitalization.

25-30% will become malnourished during hospitalization.
Sick patients have:

- A higher energy expenditure
- Poor appetite
- NPO due to testing or illness
- NPO due to being on ventilator
- Hospital food isn’t the best
- Diet is often restrictive (clear liquids, low sodium, low sugar, fluid restricted)
- No one to assist them with feeding
# Malnutrition Prevalence in a Variety of Conditions

<table>
<thead>
<tr>
<th>Disease or Condition</th>
<th>Rate of Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreatic cancer</td>
<td>85%</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>13-50%</td>
</tr>
<tr>
<td>Head and neck cancer</td>
<td>24-88%</td>
</tr>
<tr>
<td>Gastrointestinal cancer</td>
<td>55-80%</td>
</tr>
<tr>
<td>Cerebro-vascular accident</td>
<td>16-49%</td>
</tr>
<tr>
<td>COPD</td>
<td>25%</td>
</tr>
</tbody>
</table>
# Prevalence of Malnutrition in the Elderly

<table>
<thead>
<tr>
<th>Population</th>
<th>% Malnourished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community dwelling ambulatory elderly</td>
<td>5 – 12%</td>
</tr>
<tr>
<td>Community dwelling frail elderly</td>
<td>11 – 20%</td>
</tr>
<tr>
<td>Nursing home patients</td>
<td>23 – 85%</td>
</tr>
<tr>
<td>Hospitalized patients</td>
<td>32 – 50%</td>
</tr>
</tbody>
</table>

# Causes of Malnutrition in the Elderly

<table>
<thead>
<tr>
<th>Change</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Related Decrease in BMR</td>
<td>Unbalanced diet</td>
</tr>
<tr>
<td>Decreased Physical Activity</td>
<td>Loss of LBM</td>
</tr>
<tr>
<td>Muscle Loss (Sarcopenia)</td>
<td>Decreased functional ability</td>
</tr>
<tr>
<td>Sensory Impairment</td>
<td>• Reduced appetite</td>
</tr>
<tr>
<td>• Decreased sense of taste</td>
<td>• Reduced appetite</td>
</tr>
<tr>
<td>• Decreased sense of smell</td>
<td>• Difficulty with food preparation</td>
</tr>
<tr>
<td>• Loss of vision and hearing</td>
<td>• Difficulty chewing</td>
</tr>
<tr>
<td>• Oral health/dental problems</td>
<td></td>
</tr>
<tr>
<td>Psychosocial (Isolation)</td>
<td>Decreased appetite</td>
</tr>
<tr>
<td>Environmental/Financial</td>
<td>Limited access to food; poor diet quality</td>
</tr>
</tbody>
</table>
Risk Factors Associated with Poor Nutritional Status in Older Adults

- Access to food
- Difficulty eating or swallowing
- Regularly eats less than 2 meals per day
- Goes without food one or more days a month
- Cannot prepare food
- On special diet
- Partial or total feeder dependency
- Functional limitations
Physiology-the “anorexia of aging”

![Diagram showing mechanisms of malnutrition in the elderly: role of anorexia.](image)

**Fig. 1.** Mechanisms of malnutrition in the elderly: role of anorexia.
Reasons for Poor Intake

- Loss of appetite
- Early satiety
- Dysphagia
- Mucositis
- Xerostomia
- Nausea & vomiting
- Diarrhea

- Food aversion
- Taste change
- Pain
- Dependency on others for assistance
Potential Risks for Dehydration

- Hot weather
- Need helps with ADLs
- Cognitive impairment (forgets to drink)
- Swallowing problems
- Loss of thirst and poor appetite
- Fluid and diet restrictions
- Certain medications
- Use of supplements
- Tube feeding
Institutional Factors and Dehydration

- Not positioned properly for drinking
- Rushed when given food and drink
- Need help to drink and do not have access to fluids or receive assistance to open containers and pour drinks
- Fluids mistakenly withheld to prevent incontinence
- No contingency plan for “refused” fluids

Nine D’s of Weight Loss

- Disease
- Depression
- Dementia
- Diarrhea
- Dysphagia
- Dysgeusia
- Dentition
- Drugs
- Dysfunction

Causes of Weight Loss

**Medications**
- Emotional (depression)
- Alcoholism, abuse (elder)
- Late life paranoia
- Swallowing problems

**Oral problems**
- Nosocomial infections, no money

**Wandering/dementia**
- Hyperthyroidism, hypercalcemia, hypoadrenalism
- Enteric problems (malabsorption)
- Eating problems
- Low salt, low cholesterol diet
- Shopping and meal preparation problems
Prevent Unintended Weight Loss
# Percent Weight Loss

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Significant</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>1-2%</td>
<td>&gt; 2%</td>
</tr>
<tr>
<td>1 month</td>
<td>5%</td>
<td>&gt; 5%</td>
</tr>
<tr>
<td>3 months</td>
<td>7.5%</td>
<td>&gt; 7.5%</td>
</tr>
<tr>
<td>6 months</td>
<td>10%</td>
<td>&gt; 10%</td>
</tr>
<tr>
<td>%</td>
<td>Interpretation</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------</td>
<td></td>
</tr>
<tr>
<td>&gt; 150%</td>
<td>Obese</td>
<td></td>
</tr>
<tr>
<td>&gt; 120%</td>
<td>Overweight</td>
<td></td>
</tr>
<tr>
<td>80 – 90</td>
<td>Mild Malnutrition</td>
<td></td>
</tr>
<tr>
<td>70 – 79</td>
<td>Moderate Malnutrition</td>
<td></td>
</tr>
<tr>
<td>&lt; 69</td>
<td>Severe Malnutrition</td>
<td></td>
</tr>
</tbody>
</table>
# Body Mass Index

<table>
<thead>
<tr>
<th>BMI</th>
<th>Energy Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 18.5</td>
<td>Normal</td>
</tr>
<tr>
<td>17 – 18.4</td>
<td>Mild</td>
</tr>
<tr>
<td>16 – 16.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>&lt; 16</td>
<td>Severe</td>
</tr>
<tr>
<td>&lt; 13</td>
<td>Death usually occurs</td>
</tr>
</tbody>
</table>

_Ferro-Luzzi, Waterlow, EJCN 1988:42:969-981_
# Malnutrition Universal Screening Tool (MUST) – modified for use at Lifespan

<table>
<thead>
<tr>
<th>BMI Score</th>
<th>Weight Loss Score: Unplanned weight loss in the past 3-6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 20</td>
<td>&gt; 20         =     0                   &gt; 5%        =     0</td>
</tr>
<tr>
<td>18.5-20</td>
<td>18.5-20 =     1                   5-10%      =     1</td>
</tr>
<tr>
<td>&lt; 18.5</td>
<td>&lt; 18.5      =     2                   &gt; 10%      =     2</td>
</tr>
</tbody>
</table>

## Acute Disease Score:
If patient is likely to have no nutritional intake > 5 days AND/OR
Patient is acutely ill based on the following diagnoses: Anorexia nervosa, Burns, Cachexia, Coma, CVA w/Dysphagia, Malabsorption, Multiple Trauma, Newly Diagnosed Diabetes, Vomiting/Diarrhea > 3 days

| Total Score: 0 = Low Risk – Routine Care |
| Total Score: 1 = Medium Risk – Routine Care and Monitoring for Changes |
| Total Score: >2 = High Risk – Consult to Dietitian |

**Automatic Consults:** Patient admitted on tube feeding, TPN, or has a pressure ulcer(s) ≥ stage 2.

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Clinical Scoring Systems

Mini Nutritional Assessment MNA

<table>
<thead>
<tr>
<th>Screening</th>
<th>Description</th>
<th>Options</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?</td>
<td>0 = severe decrease in food intake, 1 = moderate decrease in food intake, 2 = no decrease in food intake</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Weight loss during the last 3 months</td>
<td>0 = weight loss greater than 3 kg (6.6 lbs), 1 = does not know, 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs), 3 = no weight loss</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Mobility</td>
<td>0 = bed or chair bound, 1 = able to get out of bed / chair but does not go out, 2 = goes out</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Has suffered psychological stress or acute disease in the past 3 months?</td>
<td>0 = yes, 2 = no</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Neuropsychological problems</td>
<td>0 = severe dementia or depression, 1 = mild dementia, 2 = no psychological problems</td>
<td></td>
</tr>
</tbody>
</table>

F1 Body Mass Index (BMI) (weight in kg) / (height in m²)

0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2. DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 calf circumference (CC) in cm

0 = CC less than 31
3 = CC 31 or greater

Screening score (max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

Ref.


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For more information: www.mna-elderly.com

http://www.mna-elderly.com/mna_forms.html
SGA Components

- Dietary Intake compared to usual
- GI Symptoms: frequency, intensity, duration
- Pattern of Weight Loss
- Performance Status
- Disease Impact
- Physical Examination
**SGA Assessment**

**Well Nourished**
- Stable weight
- No change in food intake
- No performance limitation
- Minimal metabolic demands/stress
- Normal PE

**At Risk of Malnutrition**
- Recent weight change
- Change in food intake
- Suboptimal performance status
- Moderate metabolic demands/stress
- Some wasting on PE

**Malnourished**
- Chronic weight change
- Severe weight loss
- Poor or no food intake
- Bedridden/poor performance status
- Primary disease has nutritional impact
- Physical exam with obvious wasting
Performance Status and Function

- Ability to conduct ADLs
- Assessment of capacity for self feeding
- Presence of impairments
- Need for occupational or speech therapy
Physical Examination: General Overview

- Fat & muscle wasting
- Skin turgor
- Edema
- Ascites
- Jaundice
- Wounds
- Skin/cutaneous lesions
General Overview

- Fat pads over triceps/biceps
- Midaxillary line @ lower rib
- Squared shoulders
- Prominence of rib cage/intercostals
Skinfold Thickness
Well nourished

Mild to moderate malnutrition

Severe malnutrition

Interosseous muscle should be flat or bulged when thumb and forefinger are put together. “Scooping” indicates loss of muscle tissue.
*Muscle Stores: Temple*

**Well nourished**
- Elderly well nourished

**Mild to moderate malnutrition**
- Look for the muscle at the temple.
- Look full at the patient and look for scooping at the temple.
- You can feel the muscle if you put your finger on the muscle and have the patient open and shut their teeth or clench.

**Severe malnutrition**
Presence of Wounds and Pressure Ulcers
Poor Skin Turgor (Dehydration)

Skin with decreased turgor remains elevated after being pulled up and released.
Edema
Pitting Edema
Oral Cavity

- Edentulism
- Ill-fitting dentures
- Decay
- Soft tissue pathology
- Candidiasis
- Dryness/cracks
- Fissures
- Ulceration
- Pain
- No saliva
- Trauma to jaw
Oral Cavity

aphthous ulcers

candidiasis
## Functional Oral Nutrition Risk Evaluation

<table>
<thead>
<tr>
<th>Structure</th>
<th>Patient-focused exam</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lips</td>
<td>• Dryness; sensation; cracking or fissuring, swelling; history of blisters or ulcers</td>
<td>Alter diet texture and consistency</td>
</tr>
<tr>
<td>Gingiva and oral mucosa</td>
<td>• Soreness/pain; bleeding; swelling; red or white patches/lesions; erosion, ulceration, erythema</td>
<td>Alter diet texture, temperature, consistency</td>
</tr>
<tr>
<td>Teeth</td>
<td>• Toothache/pain; looseness and mobility; dental prosthesis; edentulism</td>
<td>Adjust diet, consistency; evaluate caries risk</td>
</tr>
<tr>
<td>Temporomandibular</td>
<td>• Difficulty or painful opening; grinding sounds on joint opening/chewing with limited range or pain; weakness of chewing muscles</td>
<td>Change diet consistency, food “hardness”; limit chewy foods</td>
</tr>
<tr>
<td>Salivary glands</td>
<td>• Mucosal dryness; too little or too much saliva; drooling; change in color, consistency, difficulty swallowing dry food, altered taste; gland pain or swelling</td>
<td>Increase fluids; evaluate for dysgeusia, dysphagia; limit spices, “hard” foods; review changes in medication; evaluate zinc status</td>
</tr>
</tbody>
</table>
Laboratory Tests for Nutritional Assessment

- CBC – signs of anemia and lymphocyte count
- Blood glucose for hypo or hyperglycemic states
- Iron stores, ferritin, vitamin B12
- Lipids
Serum Albumin

- Low in chronic, unstressed malnutrition
- Elevated in dehydration
- Negative acute-phase reactant
- Impaired in liver and kidney failure
- Low in protein-losing enteropathies

- Strong predictor of postoperative 30 day mortality
- < 2.8 gm/dL predicted mortality
- Decline of 1.0 gm/dL associated with poor outcome

Serum Proteins

**PREALBUMIN**
- Negative acute-phase reactant
- Elevated in kidney failure
- Highly sensitive to dietary deprivation and refeeding
- Use to monitor response to nutritional therapy

**TRANSFERRIN**
- Negative acute-phase reactant
- Altered in liver disease
- Elevated in iron deficiency; chronic blood loss; pregnancy
- Decreased in cirrhosis; nephrotic syndrome; protein-losing enteropathy
- Levels fall when diet is deficient in protein
Eating Food

- Biological Physiological Needs
- Social Emotional Cultural
Psychosocial and Emotion Attributes

- Love
- Comfort
- Stress Reduction
- Coping
- Hope

- Family
- Religion
- Spirituality
- Cultural
“The quality of life and nutritional status of older adults residing in health care communities can be enhanced by individualization to less restrictive diets.”

## Risk versus Benefit of Least-Restrictive Diets

<table>
<thead>
<tr>
<th>Disease</th>
<th>Recommendation</th>
</tr>
</thead>
</table>
| **Diabetes Mellitus**    | Using medication rather than dietary changes to control blood glucose, blood lipid levels, and blood pressure can enhance the joy of eating and reduce the risk of malnutrition for older adults in health care communities.  
  Diabetes Care, 2008;31(suppl):S61-78.*                                                                                                         |
| **Cardiovascular Disease** | Nutrition care plan for older adults should focus on maintaining blood pressure and blood lipid levels while preserving eating pleasure and quality of life.                                                        |
| **Chronic Kidney Disease** | Individualizing the diet prescription for CKD patients receiving dialysis may increase total energy and protein intake and help prevent under-nutrition.                                                           |
| **Alzheimer’s Disease and Dementia** | The goal of nutrition care is to develop an individualized diet that considers food preferences, utilizes nutrient-dense foods, and offers feeding assistance as needed to achieve the individual’s goals. |
| **Palliative Care**      | The nutrition care plan should allow provision of any food or beverage that the individual will safely consume, regardless of medical diagnosis. Texture modification may be required.                                   |
Risk versus Benefit of Least – Restrictive Diets

- “A facility must care for its residents in a manner and in an environment that promotes maintenance or enhancement of each resident’s quality of life.”
  
  State Operations Manuals of the Centers for Medicare and Medicaid Services

- “Facilities must respect ethnic, cultural, religious, and other food and dining preferences, and promote the rights of each resident.”
  

- “It is often beneficial to minimize restrictions consistent with a resident’s condition, prognosis, and choices.”
  
  State Operations Manuals of the Centers for Medicare and Medicaid Services

- “Providing a more liberal diet may help prevent at F-325 citation (nutrition and unintended weight loss) because the intent is to ensure that residents maintain acceptable parameters of nutritional status.”
  
Mealtime and Dining Experience

- Encourage independence
- Promote self-esteem
- Comfort and safety
- Healthy, pleasant meal
- Provide assistance as needed
- Provide adaptive equipment if necessary
- Engage the family to assist their loved one
Careful Hand Feeding

- Build a relationship
- Talk and socialize
- Keep connected
- Limit distractions
- Test food temperature
- Identify food as it is being fed
- Do not mix foods
- Use tip of half-filled spoon
- Offer most nutritious and calorie dense foods first
- Allow enough time for person to chew and swallow
- Offer fluids throughout meal
Strategies to Increase Fluids

- Provide good oral hygiene
- Explain need for adequate fluid
- Explain that decreasing fluid intake does not decrease incontinence
- Record I & O accurately
- Weigh and record weight accurately

- Have fluids readily available
- Offer small amounts of fluid or ice chips frequently
- Offer sips between bites or food at meals and snacks
- Offer fluids on set schedule
Minimize fasting times for diagnostic and surgical procedures.

Schedule patients for tests or procedures early in the day to decrease length of time they are not allowed to eat or drink.

If testing late in the day is inevitable, ask if patient can have an early breakfast.

Provide adequate fluids and food after procedure.
Oral Nutrition Supplements

- Shown to improve nutritional status in malnourished older hospitalized adults.
- Oral liquid nourishment should be given if individual is unable to eat or finish a meal.
- Use as a medication pass or provide as a fluid with medications.
Quantify Food and Fluid Intake

- Observation
- Intake and Output
- 24 Hour Recall
- Calorie Counts
- Food Diary

- Document intake as soon as meal is finished.
- Document what is eaten.
- Document how much is eaten.
- Document if individual leaves 25% or more of uneaten food.
Post-Discharge Nutritional Support in Malnourished Elderly Individuals Improves Functional Limitations

- **N = 210**
- Randomized to nutritional supplementation and telephone counseling by RD x 3 months vs. usual care
- **Intervention**
  - Energy and protein enriched diet in hospital
  - 2 servings oral nutritional supplement
  - Vitamin D3 and calcium supplementation
  - Telephone counseling every other week x 6 weeks

Post-Discharge Nutritional Support in Malnourished Elderly Individuals Improves Functional Limitations

Results

- Body weight significantly increased in intervention group
- Functional limitations decreased more in intervention group
- No difference in physical performance, physical activities, fat-free mass, or handgrip strength at 3 months.

Virtual Family Dinner