Nutrition and Older Persons

Nutrition Through the Life Cycle: Vulnerable Persons

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Objectives
- Describe the spectrum of nutrition concerns
- Review nutritional changes with aging
- Identify risk factors for malnutrition

Suggested Reading

I. Nutrition Concerns of Older Persons

1. Demographics
   a. Increasing prevalence of older persons
   b. The old elderly (85 years and older) are among the fastest growing population segments.
   c. Major health care resource consumers - half of all Medicare dollars are spent in the last year of life.

2. Leading Causes of Death
   a. Heart disease
   b. Cancer
   c. Cardiovascular disease
   d. Accidents
   e. COPD

3. Nutrition Related Chronic Health Conditions
   a. Hypertension
   b. Hypercholesterolemia
   c. Diabetes mellitus
   d. Osteoporosis
   e. Osteoarthritis
   f. Chronic gastrointestinal conditions

II. Nutritional Changes With Aging

4. Changes with Aging that Impact Nutritional Status
   a. Decline in organ functions
      - Heart - decrease in cardiac output, stroke volume, and cardiac reserve
      - Kidney - decrease in creatinine clearance and glomerular filtration rate
      - Liver - reduced metabolism of medications
      - Bone - decline in bone density
      - Immune - reduced cell-mediated and humoral defense mechanisms
b. Changes in taste and smell
   - Diminished appetite
   - Change in satiety
   - Contribution of medications

c. Poor dentition
   - Tooth loss / ill fitting dentures
   - Decreased oral intake
   - Mortality correlates with oral health concerns

d. Altered sense of thirst
   - Estimated requirements 1 ml/kcal or 30 ml/kg body weight
   - Extreme fluid derangement's often encountered in sick, elderly patients
   - Daily I/O's and weights are often helpful
   - IV fluid intake should exceed losses by 500-800 ml per day to cover insensible losses

e. Changes in gastrointestinal functions
   - Impaired gastric emptying
   - Decreased acid secretion (achlorhydria)
   - Altered transit / constipation

f. Cognitive impairment
   - Dementia
   - Medications
   - Substance abuse

5. **Body Composition Changes with Aging**
   a. Decrease in lean body mass (sarcopenia)
   b. Reduction in total body water
   c. Loss of bone density (osteoporosis)
   d. Increase in total body fat

6. **Anthropometric Assessment**
   a. Complicated by loss of height and difficulty obtaining weight
   b. Weight history can be difficult to obtain
   c. Limited reference data
   d. Fluid status may confound assessment
   e. Skin fold measurements unreliable

7. **Changes in Nutrient Requirements with Age**

<table>
<thead>
<tr>
<th>Requirement Status</th>
<th>Nutrient</th>
</tr>
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<tbody>
<tr>
<td>Increased</td>
<td>Protein?</td>
</tr>
<tr>
<td></td>
<td>Calcium</td>
</tr>
<tr>
<td></td>
<td>Vitamin D</td>
</tr>
<tr>
<td></td>
<td>Folate</td>
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<tr>
<td></td>
<td>Vitamin B12</td>
</tr>
<tr>
<td>Decreased</td>
<td>Energy</td>
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<tr>
<td></td>
<td>Vitamin A</td>
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<tr>
<td></td>
<td>Iron needs decline in post-menopausal women</td>
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</tbody>
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8. **Energy Needs**
a. Decrease in energy metabolism associated with decline in lean body mass and physical activity
b. BMR falls 20% between the ages of 20 and 90 years

9. **Dietary Fat**
   a. Provides essential fatty acids and fat soluble vitamins
   b. Prudent diet with 20-35% or less calories as fat
   c. Reduce cholesterol, saturated fat, and trans fatty acids
   d. Liberalize therapeutic diets when appropriate

10. **Dietary Carbohydrate**
    a. Carbohydrate should comprise approximately 45-65% of total calories.
    b. Recommended fiber intake for those over 60-years is 30 gm for men and 21 gm for women.
    c. Complex carbohydrate preferred fiber source.
    d. Low fiber intake – increased risk of heart disease and colon cancer.
    e. Growing prevalence of AODM - monitor sugars and treat as appropriate.

11. **Protein Needs**
    a. Recommend 0.8 gm/kg/day for adults; approximately 10-35% of total calories.
    b. Some have suggested needs may be somewhat higher for older subjects (1-1.25 gm/kg/day).
    c. Acute or chronic illness or injury may increase protein needs (1.5-2.0 gm/kg/day)
    d. Renal or hepatic disease may necessitate protein restriction

12. **Nutritional or Immune Markers**
    a. Albumin - generally ≥ 3.8 gm/dl in healthy elderly
    b. Transferrin - tissue iron increases and serum transferrin falls
    c. Cholesterol - may see < 160 mg/dl in patients with serious underlying disease, under-nutrition, vegetarianism, or reductase inhibitor therapy
d. Immunocompetence
   - skin test anergy more common
   - relative lymphopenia more common
   - reduction in proportion of T-helper cells

III. Malnutrition Risk Factors

13. Malnutrition Among Older Persons
   a. Frequency is notable
      - Acute hospital 33%
      - Chronic care 33%
      - Community < 10%
   b. Recognition is poor
   c. Undernutrition is common before hospitalization
   d. Discharge nutritional status is predictive of readmission
   e. Opportunities for screening

14. Nutrition Screening
   a. Screening versus assessment
      - Screening identifies risk for a specific outcome like resource use.
      - Assessment is a further level of evaluation to clarify etiology, severity, and appropriate intervention.
   b. Risk factors of poor nutrition status
      - Poor food intake
      - Poverty
      - Isolation
      - Functional limitation
      - Disease
      - Polypharmacy
      - Poor dentition
      - Alcohol / substance abuse
      - Depression
      - Dementia
      - Older age
   c. Determine Checklist (see attached) - a 10-item self-report questionnaire to raise public awareness.
   d. Level I Screen - intended for administration by health professionals. Queries dietary habits, functional status, living environment, weight change, medication use, dentition, and alcohol use.
   e. Level II Screen - intended for administration by trained medical and nutrition professionals. Contains all the Level I items with additional biochemical and anthropometric measures as well as provision for further evaluation of depression and mental status as indicated.
   f. Mini Nutritional Assessment (MNA) - designed to be administered by trained medical and nutrition professionals. This tool contains anthropometric measures, weight loss, living environment, medication use, dietary habits, clinical global assessment, and self-perception of health and nutrition status.
   g. Valid screening items in relation to functional compromise or healthcare use
      - Weight loss or underweight
- Eating difficulties
- Polypharmacy
- Low albumin
- Older age
- Self-reported health, hospitalization in previous year, and >6 doctor visits in past year.

h. Interventions
- Nursing
- Social services
- Oral health
- Mental health
- Physical therapy
- Medications
- Nutrition education and counseling
- Nutrition support
- Exercise

15. Conclusion - Key take Home Points
   a. Malnutrition is an important concern for older persons.
   b. Organ systems decline in function with aging.
   c. Body composition changes with aging (sarcopenia).
   d. Nutrient requirements change with aging.
   e. Risk factors can be identified by screening.

16. Selected References


Mowe M, Bohmer T, Kindt E. Reduced nutritional status in an elderly population (> 70 years) is probable before disease and possibly contributes to the development of disease. Am J Clin Nutr 59:317-324, 1994.


Texts


**Websites**

[http://www.aafp.org/nsi](http://www.aafp.org/nsi)

[http://www.mna-elderly.com](http://www.mna-elderly.com)

**Review Questions**

1. Sarcopenia describes the ________ that occurs with aging.
   a. Decrease in fat mass
   b. Increase in fat mass
   c. Increase in muscle mass
   d. Decrease in muscle mass

2. Energy requirements tend to ________ with aging.
   a. Increase
   b. Decrease
   c. Remain unchanged

3. Risk factors for poor nutritional status among older persons include?
   a. Dementia
   b. Alcoholism
   c. Depression
   d. Poor dentition

4. Requirements for which of the following may be increased with aging?
   a. Vitamin D
   b. Vitamin B12
   c. Calcium
   d. Vitamin A

5. The Determine Checklist is a ________.
   a. A comprehensive nutrition assessment tool.
   c. A tool that determines hunger.
   d. None of the above.

Answers: 1-d, 2-b, 3-a,b,c,d, 4-a,b,c, 5-b