NUTRITION AND THE SCIENCE OF AGING:
CHANGING NUTRITION NEEDS
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NUTRITION AND THE SCIENCE OF AGING- PART 1

• Katie M. Dodd, MS, RDN, CSG, LD, FAND
• The Geriatric Dietitian
• Medford, OR
AGENDA

• Physiology of Aging
• Biological changes
• Functional changes
• Nutrition concerns
• Malnutrition
• Nutrition screening
• Identifying Risk
• Take Home Messages
• Call to Action
LEARNING OBJECTIVES

Upon successful completion of these webinars, the participant should be able to:

• Understand the *biological, physical and functional changes* associated with aging

• Recognize the *changing nutrition needs* in the older adult

• Identify *risk factors for malnutrition* in older adults

• Implement *practical techniques* to improve nutrition status in older adults
<table>
<thead>
<tr>
<th>GI Tract</th>
<th>Other Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Xerostomia</td>
<td>• ↓ skin elasticity</td>
</tr>
<tr>
<td>• Poor dentition</td>
<td>• ↑ AMD &amp; hearing loss</td>
</tr>
<tr>
<td>• Altered taste/smell</td>
<td>• Thickening of heart</td>
</tr>
<tr>
<td>• ↓ esophageal reflexes</td>
<td>• ↓ breathing capacity</td>
</tr>
<tr>
<td>• ↑ gallstone formation</td>
<td>• ↓ GFR, renal blood flow</td>
</tr>
<tr>
<td>• ↓ glucose tolerance</td>
<td>• ↓ sensory perceptions</td>
</tr>
<tr>
<td>• ↓ insulin &amp; beta-cell</td>
<td>• ↓ cognition, memory</td>
</tr>
<tr>
<td>• ↓ metabolic capacity of the liver</td>
<td>• Loss of LBM</td>
</tr>
<tr>
<td>• ↓ hepatic drug clear.</td>
<td>• Degeneration of joints</td>
</tr>
<tr>
<td>• ↑ Fecal incontinence</td>
<td>• Decalcification of bone</td>
</tr>
</tbody>
</table>

**PHYSIOLOGY OF AGING**

The National Resource Center on Nutrition & Aging

@NRCNA_engAging
BIOLOGICAL CHANGES

• Dry mouth
  • Dental health
  • Swallowing
  • Taste

• Altered taste/smell
  • Flavor matters

• Organs work differently (diminished)
PHYSICAL CHANGES

• Decreased skin elasticity
  • ↑ risk of pressure injury & skin tears

• Loss of muscle
  • Sarcopenia

• Weaker bones
  • ↑ fracture risk

• Fall risk
FUNCTIONAL CHANGES

• Mobility
• Weakness
  • Prepare meals
  • Eat independently
• Poor detention
  • Dentures
  • Chewing difficulty
• Decrease in cognition and memory
  • Impacts dietary intake
  • Independence
HEALTHY AGING

• How you live affects how you age:
  • Nutrition & Hydration
  • Physical Activity
  • Sleeping Habits
  • Mental Health
  • Lifestyle Choice (ex. smoking, drinking)

• Never too late to make changes
Approximately 10-30% of older adults are unable to absorb food sources of this nutrient:

a. Vitamin B-6  
b. Vitamin B-12  
c. Calcium  
d. Vitamin D
CHANGING NUTRITION NEEDS: CONCERNS

• Key nutrients
  • **Protein** (↑ needs)
  • **Fiber** (↓ needs)
  • **Vitamin B-12**
  • **Vitamin B-6** (↑ needs)
  • **Calcium** (↑ needs)
  • **Vitamin D** (↑ needs)
CHANGING NUTRITION NEEDS: CONCERNS

• Other concerns:
  • Malnutrition
  • Unintended weight loss
  • Muscle loss

• Maintaining independence
MALNUTRITION

• Definition:
• An acute, subacute or chronic state of nutrition, in which a combination of varying degrees of overnutrition or undernutrition with or without inflammatory activity have led to a change in body composition and diminished function.
MALNUTRITION

- Up to 1 in 2 older adults are at risk for malnutrition

- Malnutrition can cause:
  - Medical complications
  - Increased fall risk
  - Longer hospital stays
  - Readmissions to the hospital
  - Loss of independence
  - Death
MALNUTRITION

Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition

• Characteristics recommended for the diagnosis of adult malnutrition (2 or more):
  • Insufficient energy intake
  • Weight loss
  • Loss of muscle mass
  • Loss of subcutaneous fat
  • Localized or generalized fluid accumulation
  • Diminished hand-grip strength.
UNINTENDED WEIGHT LOSS

• Unintended weight loss
  • 5% in 30 days
  • 7.5% in 90 days
  • 10% in 180 days

• Insidious weight loss: gradual unintended weight loss over time (i.e. 1-2 lbs monthly)

Percentage of loss = \( \frac{\text{Usual Body Wt} - \text{Current Body Wt}}{\text{Usual Body Wt}} \times 100 \)
A WORD ON WEIGHT: BMI

• **BMI**: Body Mass Index

• **BMI Table for Adults:**

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 - 24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25 - 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30+</td>
<td>Obese</td>
</tr>
</tbody>
</table>
• Meta-analysis BMI & all-cause mortality >65 years
• U-shaped relationship:

  - ≤20.0: 28% higher mortality
  - GOOD: 24.0
  - 27.0-27.9
  - 30.9: GOOD
  - 37.0-37.9: sig. ↑ mortality
  - 33: no sig. ↑ mortality

• Optimal BMI >65 years of age: 24-30
**MUSCLE LOSS: SARCOPENIA**

- **Definition:** Decline of skeletal muscle tissue with age.

- **Major cause of:**
  - Functional decline
  - Loss of independence

MUSCLE LOSS: SARCOPENIA

MUSCLE LOSS: SARCOPENIA

- NHANES data
- Older women w/ sarcopenia cause mortality risk
- Independent of obesity

- CRIME Study data
- Hospitalized older adults sarcopenia associated w/ 
  - short- term mortality (6% vs 2%)
  - long-term mortality (36% vs 14%)
How much does an UWL of ≥ 5% in 30 days increase the likelihood of death?

a. None
b. Double
c. Triple
d. Ten-fold
UNINTENDED WEIGHT LOSS

- UWL $\geq$ 5% in 30 days $\rightarrow$ 10x ↑ death
NUTRITION SCREENING

• Mini Nutrition Assessment (MNA)
  • Validated nutrition screening tool for elderly
  • Malnourished, At Risk, Normal

• Short-form (6 questions)
  • Food intake decline
  • Weight loss
  • Mobility
  • Psychological stress or acute disease
  • Neuropsychological problems
  • BMI
### Screening

A. Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
- 0 = severe decrease in food intake
- 1 = moderate decrease in food intake
- 2 = no decrease in food intake

B. Weight loss during the last 3 months
- 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

C. Mobility
- 0 = bed or chair bound
- 1 = able to get out of bed / chair but does not go out
- 2 = goes out

D. Has suffered psychological stress or acute disease in the past 3 months?
- 0 = yes
- 2 = no

E. Neuropsychological problems
- 0 = severe dementia or depression
- 1 = mild dementia
- 2 = no psychological problems

F1. Body Mass Index (BMI) (weight in kg) / (height in m)^2
- 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)

<table>
<thead>
<tr>
<th>Points</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-14</td>
<td>Normal nutritional status</td>
</tr>
<tr>
<td>8-11</td>
<td>At risk of malnutrition</td>
</tr>
<tr>
<td>0-7</td>
<td>Malnourished</td>
</tr>
</tbody>
</table>
IDENTIFYING RISK

- Risk Factors:
  - Dietary restrictions
  - Catabolic illness
  - Blood loss
  - Poor appetite
  - Dysphagia
  - Polypharmacy
  - Malabsorption
  - Psychosocial
  - Low client-activation
  - Dementia
  - Knowledge deficit
TECHNIQUES TO IMPROVE NUTRITION STATUS

• Identified risk: now what?
  • Referral to health care team (dietitian)
  • Investigate root cause
  • Implement strategies to improve intake
REFERRAL TO HEALTH CARE TEAM

• Positive nutrition screen -> referral to dietitian

• Health care team members:
  • Medical provider
  • Registered dietitian
  • Physical therapist
  • Occupational therapist
  • Speech therapist
  • Psychologist
  • Social worker
  • Dentist
  • Pharmacist
How many older adults struggle with hunger?

a. 1 in 3
b. 1 in 6
c. 1 in 10
d. 1 in 25
GETTING TO THE ROOT CAUSE: EXAMPLE

• Statistics:
  • 1 in 6 older adults struggle with hunger
  • 15.2 million older adults are isolated & live alone
  • 9.6 million older adults are threatened by hunger
  • 18.4 million are living at or near poverty

• Could one of these be the root cause?
GETTING TO THE ROOT CAUSE

• Screen positive for:
  • Malnutrition
  • At risk for malnutrition

• Root cause:
  • WHY?

• Investigate:
  • Review screen & risk factors
  • Utilize health care team
GETTING TO THE ROOT CAUSE

• Unintended weight loss (UWL) is a **symptom**.

• Investigate the root cause (WHY)
  • No appetite... illness, mental health, medications
  • Increased nutritional needs
  • Dysphagia
  • Chewing problems or oral pain
  • Social issues

• 1 in 4 older adults with UWL... no obvious cause can be identified
STRATEGIES TO IMPROVE INTAKE: EXAMPLES

Food and/or Nutrient Delivery

• Meals and Snacks
• Medical Food Supplement Therapy
• Feeding/Dining Assistance
• Managing Feeding/Dining Environment
• Nutrition-Related Medication Management
• Other

STRATEGIES TO IMPROVE INTAKE

• Key Nutrients:
  • **Protein** (↑ needs)
  • **Fiber** (↓ needs)
  • **Vitamin B-12**
  • **Vitamin B-6** (↑ needs)
  • **Calcium** (↑ needs)
  • **Vitamin D** (↑ needs)

• **Next week cover:**
  • Needs, food sources, strategies
STRATEGIES TO IMPROVE INTAKE

MyPlate for Older Adults

https://hnrca.tufts.edu/myplate/
WRAPPING IT UP

Hopefully you now:

• Understand the *biological, physical and functional changes* associated with aging
• Recognize the *changing nutrition needs* in the older adult
• Identify *risk factors for malnutrition* in older adults
• Implement *practical techniques* to improve nutrition status in older adults
TAKE HOME MESSAGES

• Physiology of aging is complex
• Unintended weight loss & malnutrition are serious issues
• Complete nutrition screens
• Referrals to health care team
• Investigating root cause
• Implement strategies to improve nutrition status
CALL TO ACTION

- **Evaluate** current system for screening/assessment
- Identify areas for **improvement**
- **Involve** older adults in nutrition strategies
- **Initiate change** to improve nutrition
REFERENCES

1. Niedert K, Carlson M. *Nutrition Care of the Older Adult*. Academy of Nutrition and Dietetics: Chicago, IL; 2016.

2. https://www.nutritioncare.org/Malnutrition


QUESTIONS?
UPCOMING TRAINING

Nutrition and the Science of Aging

• What: Part #2 - Webinar
• When: Tuesday, December 19, 2019
• To Register: Online
THANK YOU!

@NRCNA_engAging
www.nutritionandaging.org