Nutrition & Oral Health in the Elderly

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8/18/22
Conflicts of Interest

- University of Iowa College of Dentistry
- Membership
  - Academy of Nutrition & Dietetics
    - Research Editor for Journal of the Academy of Nutrition and Dietetics
  - American Society of Nutrition
  - American Academy of Cariology
    - Interprofessional Pillar
  - American Association for Dental, Oral, and Craniofacial Research
  - American Association for Dental Education
- Consultant
  - GlaxoSmithKline (2021)
Objectives

- To define an **aging outcome**.
- To describe factors associated with aging and their implications for **nutrient requirements**.
- To describe factors associated with aging and their implications for **food intake**.
- To describe barriers associated with aging and implications for **food access**.
- To describe the implications of the aging diet on **oral health**.
- To discuss some **screening options and recommendations** for diet/nutrition therapy in the elderly.
Elderly...nutrition...where do we start?

- Genetics
- Early...prenatal...infancy
  - Fetal programming
- Infancy sets the stage for the aging process
- Lifestyle – behaviors & exposures - influences

“Nutrition is a major determinant of successful aging”
- Connie Mobley
Successful aging

- Quality of life
- Short morbidity
Aging & nutrition

To describe factors associated with aging and their implications for nutrient requirements.
Aging cofactors with nutritional implications

- Tissue composition
- Physical activity
- Intestinal function
- Medications
- Disease

Flow diagram showing interconnections between aging cofactors, tissue composition, physical activity, intestinal function, medications, and disease.
Tissue composition

- Sarcopenia
- Increased adiposity

Physical activity

- Declines in
  - Daily activity
  - Exercise
  - Overall movement
  - Balance and coordination
  - Fidgeting

- Increases in
  - Sedentary behaviors
Disease

- Chronic disease
  - Cardiovascular disease
  - Type 2 diabetes
  - Cancers
  - Obesity
- Prevention
  - Early life programming
  - Lifestyle choices - exposure
- vs. treatment
  - Band-aid approaches
- Dietary modifications or restrictions
- Reduced activity
Medications

- Xerostomia
  - Difficulty in chewing/swallowing
- Malabsorption
  - Decreased stomach acid
  - Decreased intrinsic factor
- Physical activity
  - Hypotension, balance
  - Fidgeting
- Taste and smell changes
Intestinal function

- Decreased motility
- Gastritis
- Decreased enzyme levels
- Villi surface atrophy
- Microbiome changes
Changing nutrient requirements with age

- Decreased activity
  - Decreased energy requirements
- Declines in absorption
  - Increased nutrient intakes
- Declines in metabolic function
  - Increased nutrient intakes
Aging & food intake

TO DESCRIBE FACTORS ASSOCIATED WITH AGING AND THEIR IMPLICATIONS FOR FOOD INTAKE.
Aging cofactors with food implications

- Social factors
- Sensory factors
- Acquired Conditions
- Oral factors
- Dentition
Social factors

- Cognition
- Loss of social role
- Emotional/mental health
- Isolation
Sensory function

- Taste
- Smell
Dentition

- Dentate status
- Chewing efficiency
Oral factors

- Oral motor skills
  - Dysphagia
- Soft tissue lesions
- Xerostomia
Acquired Conditions

- **Acquired conditions**
  - Neurological/developmental
    - Parkinson’s disease
  - Normal aging
    - Advanced frailty
  - Disease/trauma
    - Stroke
    - Brain injury

- **Outcome**
  - Loss of feeding skills
    - Rapid oral health deterioration
Diet-related concerns

- Aspiration
  - Aspiration pneumonia
  - Death
- Malnutrition
  - Protein energy malnutrition
  - Nutrient deficiencies
- Stressful meals
  - Time/effort requirements
  - Gagging

- Behavioral problems
  - Food avoidance
  - Impaired caregiver relationships
Aging: diet-related modifications

- Mechanism of intake
- Texture
  - Composition of product
- Frequency of intake
Modification’s impact on caries risk

- Vehicle of delivery
  - Closed vs. open cup
  - Modified utensils
Modification’s impact on caries risk

- Texture modification
  - Liquid thickeners
    - Rice cereal flakes
    - Infant fruits
    - Commercial thickeners
  - Physical modification
    - Puree/blend
    - Fork-mashing
    - Overcooking

**SimplyThick®**: soluble fiber, xanthan, gum, guar gum, pectin

**Thick-It®**: modified cornstarch, maltodextrin

Modification’s impact on caries risk

- Frequent feedings
  - Increased number of smaller volumes

- What is consumed?
  - Concentrated...balanced feedings...
    - Commercial products
    - Ensure®
    - Pediasure®
    - Carnation Instant Breakfast®
      - Plus pudding
      - Plus ice cream

Ensure: Water, Corn Maltodextrin, Sugar, Milk Protein Concentrate, Blend of Vegetable Oils (Canola, Corn), Soy Protein Isolate, Cocoa Powder (Processed with Alkali).

https://ensure.com/
Feeding practices to ensure safety can increase caries risk for remaining teeth – leading to rapid oral health deterioration.

Necessitates special attention to oral hygiene
Aging & food access

{food insecurity}

TO DESCRIBE BARRIERS ASSOCIATED WITH AGING AND IMPLICATIONS FOR FOOD ACCESS.
Aging barriers with food access implications
Finances

- Income
- Competing expenditures
Transportation

- Vehicle
  - Private vehicle
  - Public transportation

- Distance
  - Mega-market
  - Grocery store
  - Convenience store
Preparation

- Gross motor skills
- Fine motor skills
- Cognition
The aging diet and oral health

To describe the implications of the aging diet on oral health.
The aging diet

- Food quantity
  - Overweight/obesity
    - Excessive energy stores,...protein???.nutrient???
  - Protein energy malnutrition
    - Inadequate energy, protein and nutrient stores

- Food choices
  - Nutrient deficiencies
  - Fermentable carbohydrates
Overweight & obesity

- Characterized by excessive adipose stores
  - Central adiposity
- Result of current and/or history of excessive energy intake
- Diet is typically characterized by excessive volume and/or highly processed foods
- Result is metabolically active adipose tissue
Obesity…adipose tissue

Systemic
- Increased inflammation
- Micronutrient deficiencies?
- Increased risk of
  - Metabolic syndrome
  - Type 2 diabetes
  - Cardiovascular disease
  - Cancer

Oral
- Increased risk of periodontal disease
Protein energy malnutrition (PEM)

- Characterized by inadequate protein and energy reserves
- Result of inadequate dietary energy and protein or excessive energy requirements
- Diet is characterized by inadequate food volume and poor quality
- Result is overall energy, protein and nutrient deficiencies
  - Difficult to pinpoint
Systemic
- Decreased energy expenditure
- Increased apathy
- Decreased immune function
- Decreased wound healing
- Increased morbidity and mortality

Oral
- Increased periodontal disease
  - Increased oral anaerobes
  - Impaired repair responses
- Fragile soft tissue
Consequences of the aging diet

- Inadequate energy, nutrients
  - Periodontal disease
  - Soft tissue lesions
  - Oral cancer
  - Xerostomia
    - Caries

- Increased fermentable carbohydrates
  - Caries risk

- Excessive energy
  - Periodontal disease
Dietary strategies to counteract aging impact

- Frequency
- Energy/nutrient dentistry
- Texture
- Supplements
- Liquid supplements
Environmental strategies to counteract aging impact

- Congregate/senior meals
- Meals on Wheels
- Food banks
- SNAP – Supplemental Nutrition Assistance Program
Implications of diet modifications for oral health

- Frequency
- Texture
- Liquid supplements
Vitamin C
Diet therapy for the elderly

To discuss some screening options and recommendations for diet/nutrition therapy in the elderly.
Screening the elderly

- Weight
- Food groups
- Dietary changes – foods...appetite?
- Social
Formal screens...

- Nutrition Screening Initiative
  - Determine your Nutritional Health Checklist
- Mini Nutritional Assessment
  - Checklist
  - Long form
- Dietary Screening Tool
The Warning Signs of poor nutritional health are often overlooked. Use this Checklist to find out if you or someone you know is at nutritional risk.

Read the statements below. Circle the number in the “yes” column for those that apply to you or someone you know. For each “yes” answer, score the number in the box. Total your nutritional score.

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</tr>
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</tr>
<tr>
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<td>1</td>
</tr>
<tr>
<td>Without wanting to, I have lost or gained 10 pounds in the last 6 months.</td>
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**NOTE:** The Nutritional Health Checklist was developed for the Nutrition Screening Initiative. Read the statements above, and circle the number in the “yes” column for each statement that applies to you. Add up the circled numbers to get your score.
## Mini Nutritional Assessment (MNA®)

**Screening**

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
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</table>
| 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                        |
Recommendations for Intervention

**MNA Score**

- **Normal Nutritional Status (12 – 14 points)**
  - **RESCREEN**
    - After acute event or illness
    - Once per year in community dwelling elderly
    - Every 3 months in, at risk, or malnourished
  - **MONITOR**
    - Close weight monitoring
    - Rescreen every 3 months

- **At Risk of Malnutrition (8 – 11 points)**
  - **No Weight Loss**
    - **RESCREEN** as needed
  - **Weight Loss**
    - **TREAT**
      - Nutrition intervention
      - Diet enhancement
      - Oral nutritional supplementation (400 kcal/d)²

- **Malnourished (0-7 points)**
  - **TREAT**
    - Nutrition intervention
    - Oral nutritional supplementation (400-600 kcal/d)²
    - Diet enhancement

Complete the screen by filling in the boxes with the appropriate numbers. Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score.

### 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 3kg (6.6lbs)
- 1 = does not know
- 2 = weight loss between 1 and 3kg (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

### Section J
- How many full meals does the patient eat daily?
  - 0 = 1 meal
  - 1 = 2 meals
  - 2 = 3 meals

### Section K
- Selected consumption markers for protein intake
  - At least one serving of dairy products (milk, cheese, yoghurt) per day
  - Two or more servings of legumes or eggs per week
  - Meat, fish or poultry every day
- 0.0 = if 0 or 1 yes
- 0.5 = if 2 yes
- 1.0 = if 3 yes
  - yes
  - no

### Section L
- Consumes two or more servings of fruit or vegetables per day?
- 0 = no
- 1 = yes

### Section M
- How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
- 0.0 = less than 3 cups
- 0.5 = 3 to 5 cups
- 1.0 = more than 5 cups
- 0.0
- 0.5
- 1.0
<table>
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<tr>
<th>DST component</th>
<th>Point classification</th>
</tr>
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<tbody>
<tr>
<td>Whole fruit and juice</td>
<td>15</td>
</tr>
<tr>
<td>How often do you usually eat fruit as a snack?</td>
<td>(5)</td>
</tr>
<tr>
<td>How often do you eat fruit (not including juice)?</td>
<td>(5)</td>
</tr>
<tr>
<td>How often do you drink some kind of juice at breakfast?</td>
<td>(5)</td>
</tr>
<tr>
<td>Vegetables</td>
<td>15</td>
</tr>
<tr>
<td>How often do you eat carrots, sweet potatoes, broccoli, or spinach?</td>
<td>(8)</td>
</tr>
<tr>
<td>How many different vegetable servings do you usually have at your main meal of the day?</td>
<td>(7)</td>
</tr>
<tr>
<td>Total and whole grains</td>
<td>15</td>
</tr>
<tr>
<td>How often do you usually eat whole-grain breads?</td>
<td>(5)</td>
</tr>
<tr>
<td>How often do you usually eat whole-grain cereals?</td>
<td>(5)</td>
</tr>
<tr>
<td>How often do you eat hot or cold breakfast cereal?</td>
<td>(5)</td>
</tr>
<tr>
<td>Lean proteins</td>
<td>10</td>
</tr>
<tr>
<td>How often do you eat chicken or turkey?</td>
<td>(5)</td>
</tr>
<tr>
<td>How often do you eat fish or seafood that is not fried?</td>
<td>(5)</td>
</tr>
<tr>
<td>Added fats, sugars, and sweets</td>
<td>25</td>
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<tr>
<td>How often do you usually eat candy or chocolate?</td>
<td>(4)</td>
</tr>
<tr>
<td>How often do you eat crackers, pretzels, chips, or popcorn?</td>
<td>(4)</td>
</tr>
<tr>
<td>How often do you eat cakes or pies?</td>
<td>(4)</td>
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<tr>
<td>How often do you eat cookies?</td>
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<tr>
<td>How often do you eat ice cream?</td>
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<tr>
<td>Do you usually add butter or margarine to foods such as bread, rolls, or biscuits?</td>
<td>(1)</td>
</tr>
<tr>
<td>Do you usually add fat (butter, margarine or oil) to potatoes and other vegetables?</td>
<td>(1)</td>
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<tr>
<td>Do you use gravy (when available) at meals?</td>
<td>(1)</td>
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<tr>
<td>Do you usually add sugar or honey to sweeten your coffee or tea?</td>
<td>(1)</td>
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<tr>
<td>Do you usually drink wine, beer, or other alcoholic beverages?</td>
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<tr>
<td>Dairy</td>
<td>10</td>
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<td>How often do you drink a glass of milk?</td>
<td>(5)</td>
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Which tool?

What do you really want to know?

What do you feel comfortable doing?

1. Screen...every client
2. Determine Your Health Checklist
3. MNA Checklist
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http://www.mna-elderly.com/
Diet recommendations for the elderly

- MyPlate: [https://www.myplate.gov/](https://www.myplate.gov/)
Healthy Eating As We Age

As we age, healthy eating can make a difference in our health, help to improve how we feel, and encourage a sense of well-being. Eating healthy has benefits that can help older adults:

Nutrients

- Obtain nutrients needed by the body such as potassium, calcium, vitamin D, vitamin B₁₂, minerals, and fiber.
- Lose weight or maintain a healthy weight
- Reduce the risk of developing chronic diseases such as high blood pressure, diabetes, hypertension, and heart disease. If you have a chronic disease, eating well can help to manage the disease.
- Meet individual calorie and nutrition needs.
- Help to maintain energy levels.

Special Nutrition Concerns for Older Adults

Our daily eating habits change as our bodies get older. Make small adjustments to help you enjoy the foods and beverages you eat and drink.
Additional resources

- NIH Senior Health

- AARP Food Programs & Resources for Older Americans

- The Vegetarian Resource Group's Senior’s Guide to Good Nutrition
  - http://www.vrg.org/nutrition/seniors.htm
Proactive....

- Anticipatory guidance
- As oral health/systemic health changes
  - Watch for diet changes before see problems
Questions
OUTCOME OF SUCCESSFUL AGING