

## Nutrition in adulthood & the later years



## Key concepts

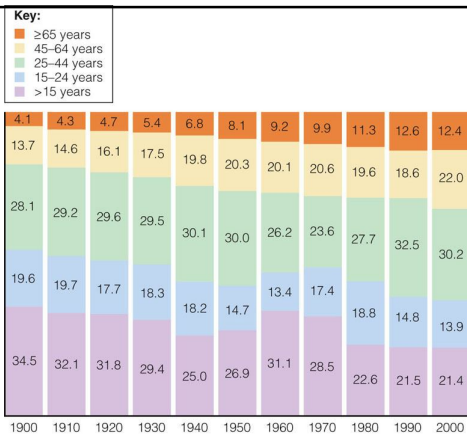
- Gradual aging throughout the adult years is an individual process based on genetic heritage & life expectancy
- Aging is a total life process – with biologic, nutritional, social, economic, psychologic, & spiritual aspects.

## Chapter outlines

- Introduction
- Nutrition & longevity
  - Observation of older adults
  - Manipulation of diet
  - Aging process, related to stress response
- Physiological changes
- Other changes
  - Psychological changes
  - Economic changes
  - Social changes
- Energy & nutrition needs
- Nutrition-related concerns of older adults
- Food choices & eating habits
- Strategies for growing old healthfully

## Introduction

- Life expectancy
  - USA: WF 81y, BF 76y; WM 75y, BM 69y (1900 49y), 80y + 9y (F), 7y (M)
- Life span
  - 130y
- Longevity
  - Long duration of life



## Nutrition & longevity

- Aging process, can it be slowed?
  - Healthy lifestyle habits (nutritious food), physical activity
  - Person's life expectancy: 70 – 80% individual related behaviors: 20 – 30% genes
- Role of nutrition?
  - Nutrition improve the quality of life in the later years





## Observation of older adults

- Physiological age & chronological age
- Lifestyle behaviors ~ health
  - Sleeping regularly & adequately
  - Eating well-balanced meals, incl. breakfast, regularly
  - Engaging in physical activity regularly
  - Not smoking
  - Not using alcohol
  - Maintaining a healthy body weight

## ...Observation of older adults

- Physical Activity
  - Many benefits including lower weight, greater flexibility, increased endurance, better balance and health, and a longer life span
  - Regular physical activity can prevent or delay the decrease in muscle mass and strength that occur with age.
  - Active people benefit from higher energy and nutrient intakes.
  - Start easy and build slowly
  - Check with physician

TABLE 17-1 Exercise Guidelines for Older Adults

	Endurance	Strength	Balance	Flexibility
Examples				
Start easy	Be active 5 minutes on most or all days.	Using 0- to 2-pound weights, do 1 set of 8 repetitions twice a week.	Hold onto table or chair with one hand, then with one finger.	Hold stretch 10 seconds; do each stretch 3 times.
Progress gradually to goal	Be active 30 minutes (minimum) on most or all days.	Increase weight as able; do 2 sets of 8-15 repetitions twice a week.	Do not hold onto table or chair; then close eyes.	Hold stretch 30 seconds; do each stretch 5 times.
Cautions and comments	Stop if you are breathing so hard you can't talk or if you feel dizziness or chest pain.	Breathe out as you contract and in as you relax (do not hold breath); use smooth, steady movements.	Incorporate balance techniques with strength exercises as you progress.	Stretch after strength and endurance exercises for 20 minutes, 3 times a week; use slow, steady movements; bend joints slightly.

SOURCE: *Exercise: A Guide from the National Institute on Aging*, www.nia.nih.gov.

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## Manipulation of diet

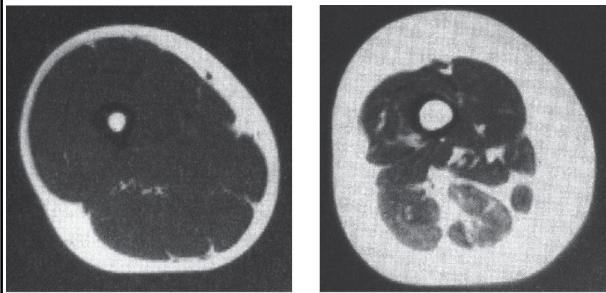
- Energy restriction in animals
  - Enough food to prevent malnutrition & energy intake <70% of normal
  - Role of gene activity
  - Disease ↓; improve: blood glucose, insulin sens, blood lipids; energy metab slows
- Energy restriction in human beings
  - How? Eating less or weighing less?
  - Moderately restricted
  - Fasting → similar benefit
  - Nutritional adequacy: essential to living a long & healthy life

## The aging process

- Physiological, psychological, social, and economic changes that accompany aging affect nutritional status.
- Everyday stress can influence physical and psychological aging.
- Stressors elicit the body's stress response.
- Stress (physically & psychologically) promotes the early onset of age-related diseases
- Physical stressors include alcohol and drug abuse, smoking, pain and illness.
- Psychological stressors include exams, divorce, moving, and the death of loved ones.
  - Stress response: men ≠ women
- Malnutrition is common.

## Physiological changes

- Body weight
  - Overweight, underweight
- Body composition
  - Sarcopenia
  - Nutrition and exercise play a role in maintaining muscle mass.
- Immune system
  - Compromised immune systems can occur with age.
  - Incidences of infectious disease increase
- GI tract
  - Constipation, atrophic gastritis, dysphagia
- Tooth loss...



These cross sections of two women's thighs may appear to be about the same size from the outside, but the 20-year-old woman's thigh (left) is dense with muscle tissue. The 64-year-old woman's thigh (right) has lost muscle and gained fat, changes that may be largely preventable with strength-building physical activities.

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- Consequences of atrophic gastritis:
  - Inflamed stomach
  - Increased bacterial growth
  - Reduced hydrochloric acid
  - Reduced intrinsic factor
  - Increased risk of nutrient deficiencies, notably of vit B12

- ### Physiological changes...
- Tooth loss
    - Dry mouth
    - Eating difficulty
    - No dental care within 2y
    - Tooth or mouth pain
    - Altered food selections
    - Lesions, sores, or lumps in mouth
  - Sensory losses & other physical problems
    - Failing eyesight, loss of taste & smell, loss of vision & hearing

- ### Other changes
- Psychological changes
    - Depression and loss of appetite commonly occur together.
    - Support and companionship of family and friends are helpful.
  - Economic changes
    - Low income
  - Social changes
    - Loneliness → nutritional inadequacies (esp. for energy intake)
    - Malnutrition is common

- ### Energy and Nutrient Needs of Older Adults
- There are many nutrient concerns for aging adults.
  - Supplements are not routinely recommended.
  - Nutrient needs and health needs are highly individualized.

- ### ...Energy & nutrition needs of older adults
- Water
    - Dehydration increases risks for urinary tract infections, pneumonia, pressure ulcers, confusion and disorientation.
    - Fluid needs are not recognized.
    - Mobility and bladder problems
    - Water recommendations: at least 6 glasses per day
  - Energy & energy nutrients
    - Energy needs decrease by around 5% per decade.
    - Protein to protect muscle mass, boost the immune system, and optimize bone mass
    - Carbohydrate for energy
    - Fiber and water to reduce constipation
    - Fat to enhance flavors of foods and provide valuable nutrients

## ...Energy & nutrition needs of older adults

- Vitamins & minerals
    - Vitamin B12, vit D, calcium, iron
  - Nutrients supplements
    - Vitamin D and calcium for osteoporosis
    - Vitamin B<sub>12</sub> for pernicious anemia
    - Iron
    - Not substitute for foods
- [Summary](#)

### IN SUMMARY

The table below summarizes the nutrient concerns of aging. Although some nutrients need special attention in the diet, supplements are not routinely recommended. The ever-growing number of older people creates an urgent need to learn more about how their nutrient requirements differ from those of others and how such knowledge can enhance their health.

Nutrient	Effect of Aging	Comments
Water	Lack of thirst and decreased total body water make dehydration likely.	Mild dehydration is a common cause of confusion. Difficulty obtaining water or getting to the bathroom may compound the problem.
Energy	Need decreases as muscle mass decreases (sarcopenia).	Physical activity moderates the decline.
Fiber	Likelihood of constipation increases with low intakes and changes in the GI tract.	Inadequate water intakes and lack of physical activity, along with some medications, compound the problem.
Protein	Needs may stay the same or increase slightly.	Low-fat, high-fiber legumes and grains meet both protein and other nutrient needs.
Vitamin B <sub>12</sub>	Atrophic gastritis is common.	Deficiency causes neurological damage; supplements may be needed.
Vitamin D	Increased likelihood of inadequate intake; skin synthesis declines.	Daily sunlight exposure in moderation or supplements may be beneficial.
Calcium	Intakes may be low; osteoporosis is common.	Stomach discomfort commonly limits milk intake; calcium substitutes or supplements may be needed.
Iron	In women, status improves after menopause; deficiencies are linked to chronic blood losses and low stomach acid output.	Adequate stomach acid is required for absorption; antacid or other medicine use may aggravate iron deficiency; vitamin C and meat increase absorption.

## Nutrition-related concerns of older adults

- Vision
  - Cataract
    - Consuming foods or taking supplements of vitamin C, vitamin E, and carotenoids may decrease the risk or slow progression of cataracts.
    - Some association with obesity
  - Macular degenerations
    - Antioxidants, zinc, lutein, zeaxanthins, and omega-3 fatty acids are preventative factors.
    - Total fat intake may be a risk factor.

## ...Nutrition-related concerns of older adults

- Arthritis
  - [Osteoarthritis](#)
    - weight loss, aerobic activity & strength training
  - Rheumatoid arthritis
    - Omega-3 fatty acids may reduce joint tenderness and motility.
    - Vitamin C, vitamin A, and carotenoids as antioxidants often help.
  - Gout
    - There are increased uric acid levels when meat and seafood are consumed.
    - Milk products lower uric acid levels.
- The aging brain...

- Risk factors for osteoarthritis
  - Age
  - Smoking
  - High BMI at age 40
  - Lack of hormone tx (in women)

## Nutrition-related concerns of older adults...

- The aging brain
    - Nutrient deficiencies & brain function
      - Neurotransmitters need precursor nutrients.
      - Senile dementia
      - Neurons diminish as people age.
- [Summary](#)

**TABLE 17-2** Summary of Nutrient-Brain Relationships

Brain Function	Depends on an Adequate Intake of:
Short-term memory	Vitamin B <sub>12</sub> , vitamin C, vitamin E
Performance in problem-solving tests	Riboflavin, folate, vitamin B <sub>12</sub> , vitamin C
Mental health	Thiamin, niacin, zinc, folate
Cognition	Folate, vitamin B <sub>6</sub> , vitamin B <sub>12</sub> , iron, vitamin E
Vision	Essential fatty acids, vitamin A
Neurotransmitter synthesis	Tyrosine, tryptophan, choline

## Food choices & eating habits of older adults

- Risk factors of malnutrition in older adults
  - **Disease:** Have an illness or condition that changes the types or amounts of foods you eats?
  - **Eating poorly:** Eat <2 meals/day? Eat fruits, vegetables, & dairy products daily?
  - **Tooth loss or mouth pain:** Difficult or painful to eat?
  - **Economic hardship:** Have enough money to buy food you need?
  - **Reduced social contact:** Eat alone most of the time?
  - **Multiple medication:** Take 3 or more different medications?
  - **Involuntary weight loss or gain:** Lost or gained 10 pounds or more in the last 6 months?
  - **Needs assistance:** Physically able to shop, cook, or feed of yourself?
  - **Elderly person:** Older than 80?

### Subjective global assessment (SGA)

(Select appropriate category with a checkmark, or enter numerical value where indicated by "#.")

A. History

1. Weight change  
 Overall loss in past 6 months: amount = # \_\_\_\_\_ kg; % loss = # \_\_\_\_\_  
 Change in past 2 weeks: \_\_\_\_\_ no change, \_\_\_\_\_ increase, \_\_\_\_\_ decrease.

2. Dietary intake change (relative to normal)  
 No change, \_\_\_\_\_ duration = # \_\_\_\_\_ weeks  
 Change \_\_\_\_\_ type: \_\_\_\_\_ suboptimal liquid diet, \_\_\_\_\_ full liquid diet  
 \_\_\_\_\_ hypocaloric liquids, \_\_\_\_\_ starvation.

3. Gastrointestinal symptoms (that persisted for >2 weeks)  
 \_\_\_\_\_ none, \_\_\_\_\_ nausea, \_\_\_\_\_ vomiting, \_\_\_\_\_ diarrhea, \_\_\_\_\_ anorexia.

4. Functional capacity  
 No dysfunction (e.g., full capacity), \_\_\_\_\_ duration = # \_\_\_\_\_ weeks.  
 Dysfunction \_\_\_\_\_ type: \_\_\_\_\_ working suboptimally, \_\_\_\_\_ bedridden.

5. Disease and its relation to nutritional requirements  
 Primary diagnosis (specify) \_\_\_\_\_  
 Metabolic demand (stress): \_\_\_\_\_ no stress, \_\_\_\_\_ low stress, \_\_\_\_\_ moderate stress, \_\_\_\_\_ high stress.

B. Physical (for each trait specify: 0 = normal, 1+ = mild, 2+ = moderate, 3+ = severe).  
 # \_\_\_\_\_ loss of subcutaneous fat (triceps, chest)  
 # \_\_\_\_\_ muscle wasting (quadriceps, deltoids)  
 # \_\_\_\_\_ ankle edema  
 # \_\_\_\_\_ sacral edema  
 # \_\_\_\_\_ ascites

C. SGA rating (select one)  
 \_\_\_\_\_ A = Well nourished  
 \_\_\_\_\_ B = Moderately (or suspected of being) malnourished  
 \_\_\_\_\_ C = Severely malnourished

## Subjective Global Assessment (SGA)

1. Weight changes
2. Changes in dietary intake
3. Gastrointestinal symptoms
4. Functional capacity
5. Link between disease & nutritional requirements
6. Physical exam focused on nutritional aspect

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## SGA: 1. Weight change

- Over the last 6 months
  - Involuntary ↑ or ↓ in weight ≥10% of usual weight
- During the past 2 weeks
  - ≥ 5% of usual weight over 1 months

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## SGA: 2. Dietary intake

- No change
- Changes
  - Duration
  - Type
    - Inadequate conventional diet
    - Total liquid diet
    - Clear liquid diet (hypocaloric)
    - Fasting

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### SGA: 3. Gastrointestinal symptoms

- Nausea
- Vomiting
- Diarrhea
- Anorexia

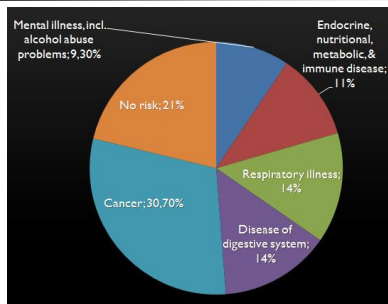
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### SGA: 4. Functional capacity

- Dysfunction
  - Duration
  - Type
    - Ambulatory
    - bedridden

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### SGA: 5. Illness & nutritional requirements



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### SGA: 6. Physical examination

- Loss of cutaneous fat
- Muscle wasting
- Ankle edema
- Sacral edema
- Ascites
- Mouth, teeth, gum problems
- Chewing/swallowing problems
- Angular stomatitis
- Fractures or bone pain
- Glossitis
- Skin alterations

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### SGA: Diagnosis

- Well-nourished
- Moderately malnourished or suspected malnutrition
- Severely malnourished

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### Other tools

- MST
- MUST
- MNA & MNA-SF

## Support a high quality of life

TABLE 17-4 Strategies for Growing Old Healthfully

- Choose nutrient-dense foods.
- Be physically active. Walk, run, dance, swim, bike, or row for aerobic activity. Lift weights, do calisthenics, or pursue some other activity to tone, firm, and strengthen muscles. Practice balancing on one foot or doing simple movements with your eyes closed. Modify activities to suit changing abilities and tastes.
- Maintain appropriate body weight.
- Reduce stress (cultivate self-esteem, maintain a positive attitude, manage time wisely, know your limits, practice assertiveness, release tension, and take action).
- For women, discuss with a physician the risks and benefits of estrogen replacement therapy.
- For people who smoke, discuss with a physician strategies and programs to help you quit.
- Expect to enjoy sex, and learn new ways of enhancing it.
- Use alcohol only moderately, if at all; use drugs only as prescribed.
- Take care to prevent accidents.
- Expect good vision and hearing throughout life; obtain glasses and hearing aids if necessary.
- Take care of your teeth; obtain dentures if necessary.
- Be alert to confusion as a disease symptom, and seek diagnosis.
- Take medications as prescribed; see a physician before self-prescribing medicines or herbal remedies and a registered dietitian before self-prescribing supplements.
- Control depression through activities and friendships; seek professional help if necessary.
- Drink 6 to 8 glasses of water every day.
- Practice mental skills. Keep on solving math problems and crossword puzzles, playing cards or other games, reading, writing, imagining, and creating.
- Make financial plans early to ensure security.
- Accept change. Work at recovering from losses; make new friends.
- Cultivate spiritual health. Cherish personal values. Make life meaningful.
- Go outside for sunshine and fresh air as often as possible.
- Be socially active—play bridge, join an exercise or dance group, take a class, teach a class, eat with friends, volunteer time to help others.
- Stay interested in life—pursue a hobby, spend time with grandchildren, take a trip, read, grow a garden, or go to the movies.
- Enjoy life.

## Reference

- Whitney E, Rolfes SR. 2011. Understanding Nutrition 12<sup>th</sup> ed. Int'l student ed. Thomson Learning Inc., USA.
- SGA: TNT (Total Nutrition Therapy) course version 2
- MST <http://www.health.qld.gov.au/patientsafety/pupp/documents/malsc.pdf>
- MUST [www.bapen.org.uk](http://www.bapen.org.uk)
- MNA [www.mna-elderly.com](http://www.mna-elderly.com)