Chapter 12: Nutrition from 1 to 100

David McLain/NG Image Collection

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Student learning outcomes: At the end of this chapter, you should be able to:

- Describe the importance of nutrition and life-style choices in health and disease at various life stages
- Plan a diet to meet recommendations at various life stages

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THINK about this – then share within a PAIR – then SHARE with the class

- What should children eat?
- What eating recommendations would you make to a teenager?
- How should eating change later in life?

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Nutrient needs of children

- Calories and protein:
  - 2 years old: 1000 Calories, 13 g of protein/day
  - 6 years old: 1600 Calories, 19 g of protein/day
- Carbohydrates same as adults: 45–65% of total energy intake
- Fat percentage higher: 30–40% of total energy intake for 1–3-year-olds and 25–35% for 4–18-year-olds // as children grow, recommended proportion of calories from fat decreases

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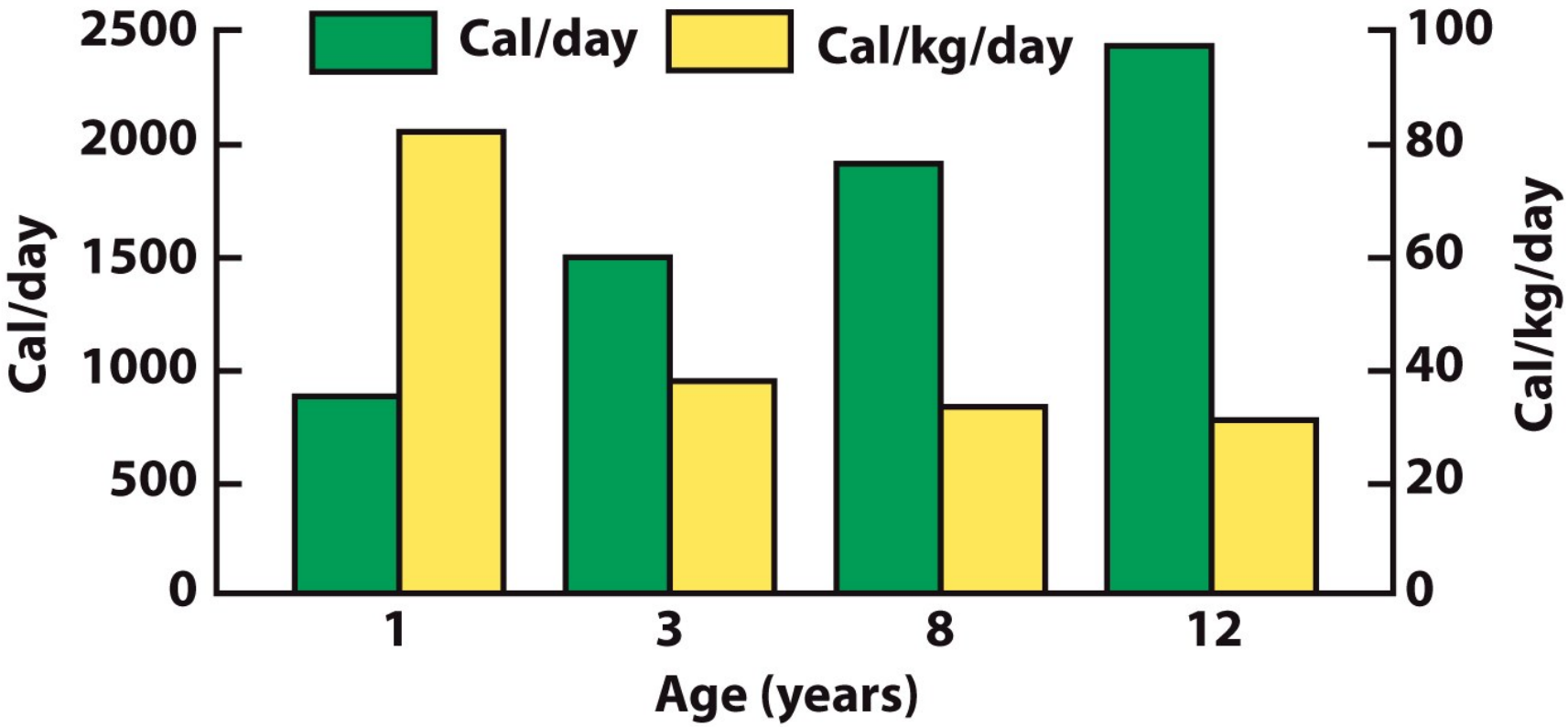
Energy needs of children



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Nutrient needs of children

- Water: can meet water needs by drinking enough to satisfy thirst in most situations

- Micronutrients: smaller amounts than adults
  - Like adults, a varied, nutrient-dense diet can meet all vitamin and mineral requirements

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Bone health in children

- Calcium: RDA = 700 milligrams/day for ages 1–3; 1000 mg/day for ages 4–8
  - Adequate calcium intake during childhood is essential for achieving maximum peak bone mass to prevent osteoporosis later in life
- Vitamin D: RDA = 600 IU (15 µg)/day for children, adolescents, and young adults

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Iron in children

- Iron: RDA = 7 mg/day for ages 1–3 // 10 mg/day for ages 4–6 (latter is higher than for adult men)
  - Required for growth
  - Iron-deficiency anemia can impair learning ability and intellectual performance
    - Treated with iron supplements until iron stores are replenished
    - Keep supplements out of the reach of children to prevent iron toxicity

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Developing healthy eating habits

- What we learn to eat as children affects food choices as adults
- Caregivers decide which foods are offered when, and where foods should be eaten
- Child decides whether to eat, what foods to eat, and how much to consume
- With age, choices are increasingly affected by social activities, what they see at school, and what their friends are eating

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What to offer to children

- Balanced and varied diet adequate in energy and essential nutrients and appropriate to developmental needs with appropriate portions
- A healthy meal plan based on whole grains, vegetables, and fruits; including adequate milk and other high-protein foods; and containing moderate amounts of fat and sodium
- Best indicator of adequate nourishment, neither too little nor too much, is *normal growth pattern*

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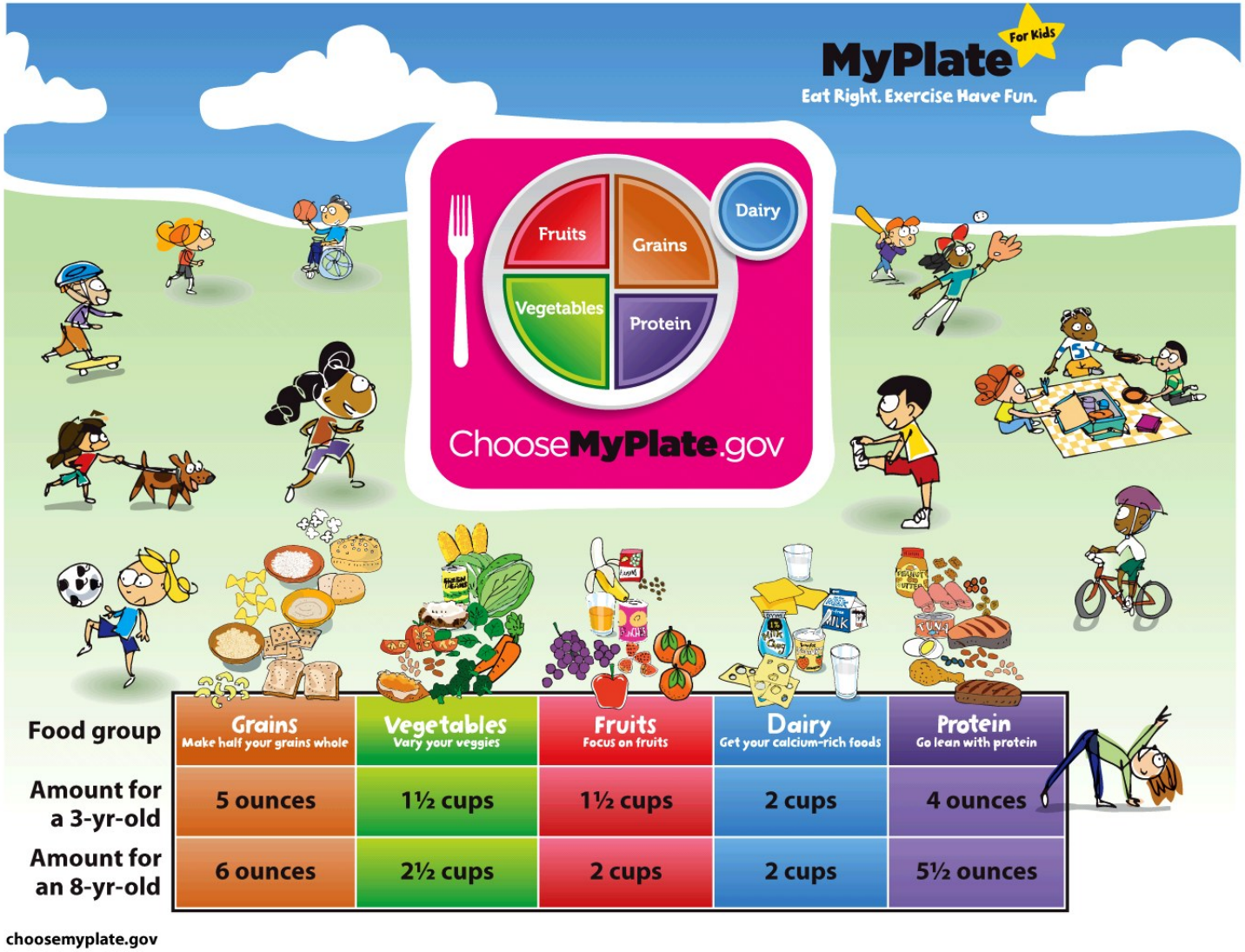
What to offer to children



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Increasing variety

- Introduce new foods into a child's diet regularly
- Food preferences are learned through repeated exposure; may need to be offered 8–10 times
- Introduce a new food at the beginning of a meal, when the child is hungry
- Allow child to see parents or peers eating it
- Incorporate healthy foods into familiar dishes

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Limiting juice in children

- Most fruit servings should come from fruit, with limited amounts from 100% juice, not fruit drinks or cocktails
- Limit juice to 4–6 ounces/day for children ages 1–6 and 8–12 oz for children over age 7

Tim Laman/NG Image Collection

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What should I eat in childhood?

- Serve frequent nutritious meals and snacks
- Sneak in more fruits and vegetables
- Include calcium where you can
- Add iron

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Offering meals & snacks

- Small, nutrient-dense meals and snacks
  - Ideally every 2–3 hours throughout the day
  - Snacks should be as nutritious as meals to ensure that nutrient needs are met
- Establish consistent meal pattern; children thrive on routine and feel secure when they know what to expect
- Children who eat breakfast are more likely to meet nutrient needs and do better in school

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Typical meals & snacks for children

Typical meal and snack patterns for 3- and 8-year-old children Table 12.1

Food	Amount 3-year-old	Amount 8-year-old
Breakfast		
Whole grain cereal	1/2 cup	1 cup
Milk, 2%	1/2 cup	1/2 cup
Banana	1/2 medium	1 medium
Snack		
Peanut butter	2 Tbsp	2 Tbsp
Whole wheat crackers	5	5
Milk, 2%	1/2 cup	1 cup
Lunch		
Vegetable soup	1/2 cup	1 cup
Grilled tuna sandwich	1/2	1
Tomato	1/4 medium	1/2 medium
Orange	1/2 medium	1 medium
Milk, 2%	1/2 cup	1 cup
Snack		
Broccoli crowns	4	6
Ranch salad dressing	1 tsp	2 tsp
Dinner		
Chicken drumsticks	1	2
Baked sweet potato	1/2 cup	1 cup
Green beans	1/4 cup	1/2 cup
Milk, 2%	1/2 cup	1 cup
Graham crackers	1	2
Snack		
Yogurt	1/2 cup	1 cup
Berries	1/2 cup	3/4 cup

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Breakfast & school performance

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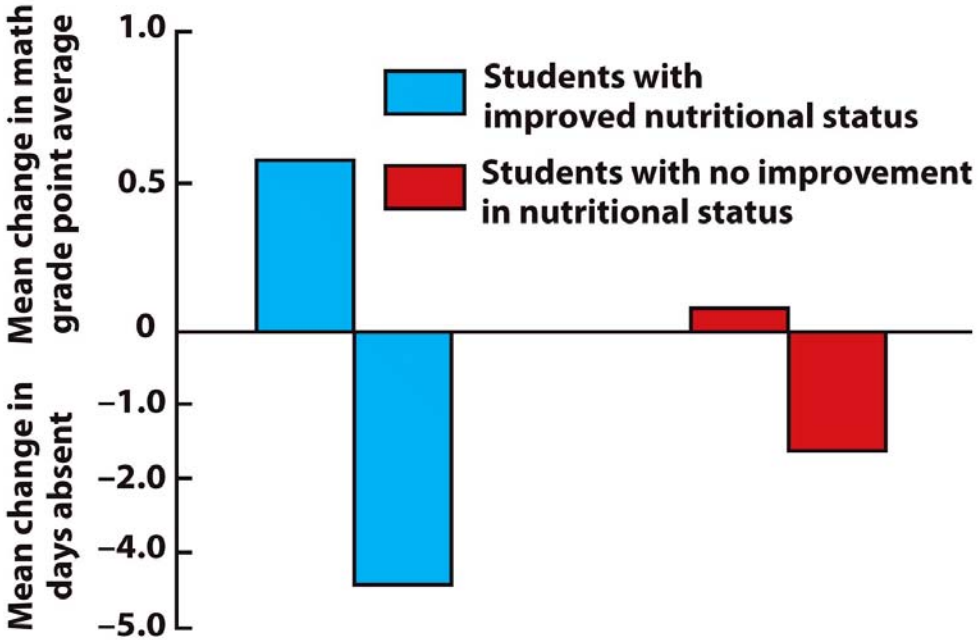

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Meal settings

- Eating meals together helps connect with family and culture
  - Better school performance and decreased unhealthy weight-loss practices and substance abuse
- Eating patterns, attitudes, and feeding styles of caregivers influence what they learn to eat
- Give plenty of time to finish eating
- Mealtime should not be a battle zone // food should not be used as a reward or a punishment

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National School Lunch Program

- To improve nutrition of US children and promote nutrition education by teaching children to make appropriate food choices
- Meals provided free or at reduced costs if family income ≤ 130% of poverty level
  - Each meal includes servings of milk, high-protein foods, vegetables, fruit, and grains and must provide one-third of the RDA for protein, vitamin A, vitamin C, iron, calcium, and energy and contain no more than 30% of energy from fat and 10% from saturated fat

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National School Lunch Program

- Federal guidelines regulate foods sold at snack bars and in vending machines that compete with school-lunch programs
  - Must provide at least 5% of the RDA for one or more of the following: protein, vitamin A, vitamin C, niacin, riboflavin, calcium, and iron

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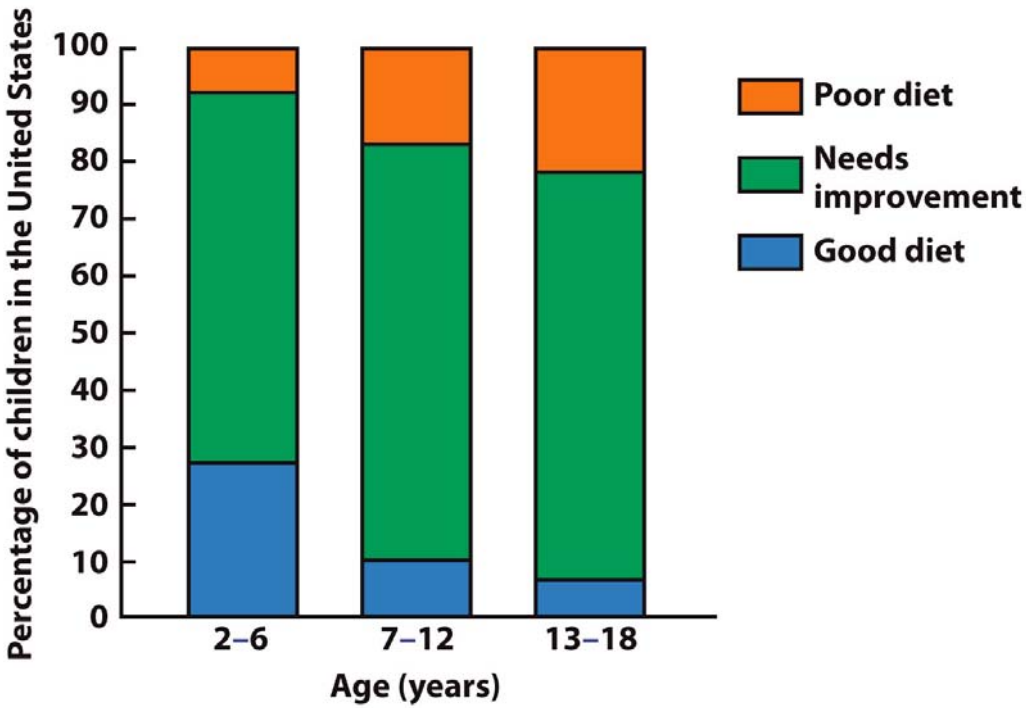
How good are children's diets?

According to the graph, the age group with the highest percentage of children with poor diets is:

a) 2 to 6 year olds
b) 7 to 12 year olds
c) 13 to 18 year olds
d) No difference



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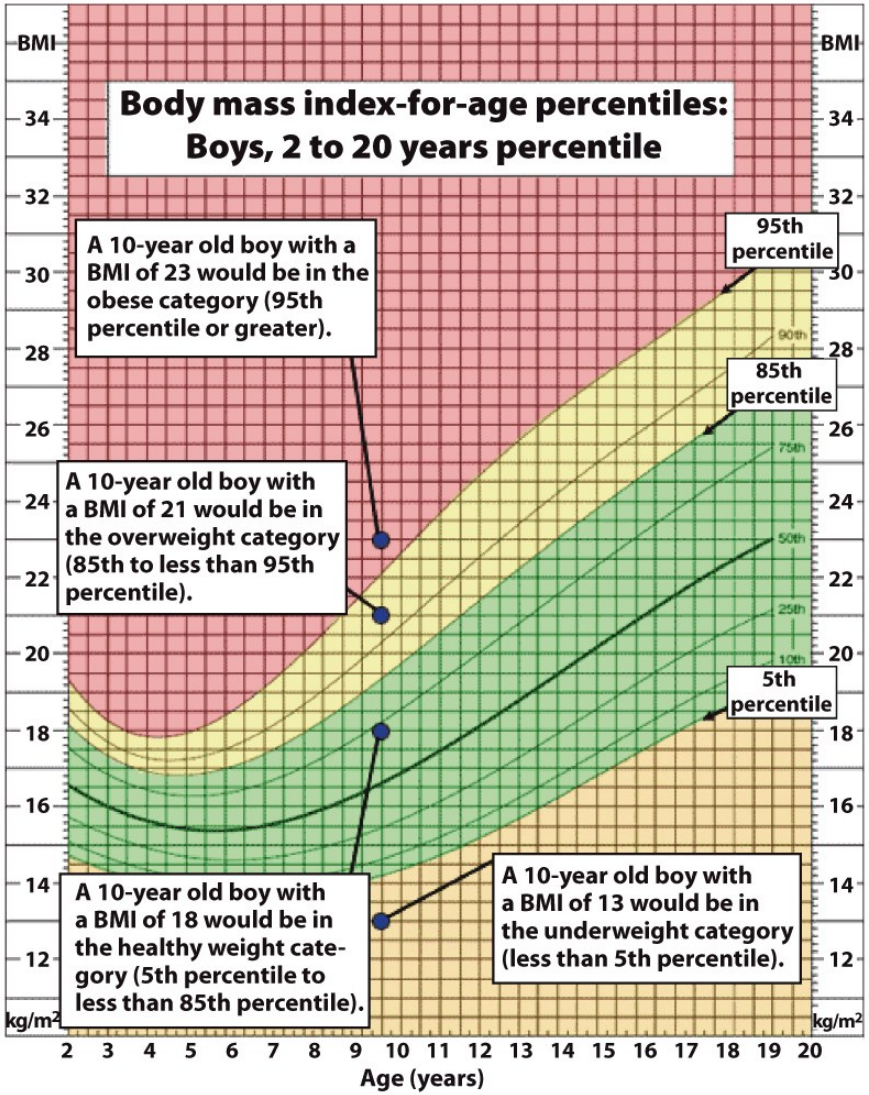
Body mass index-for-age percentiles



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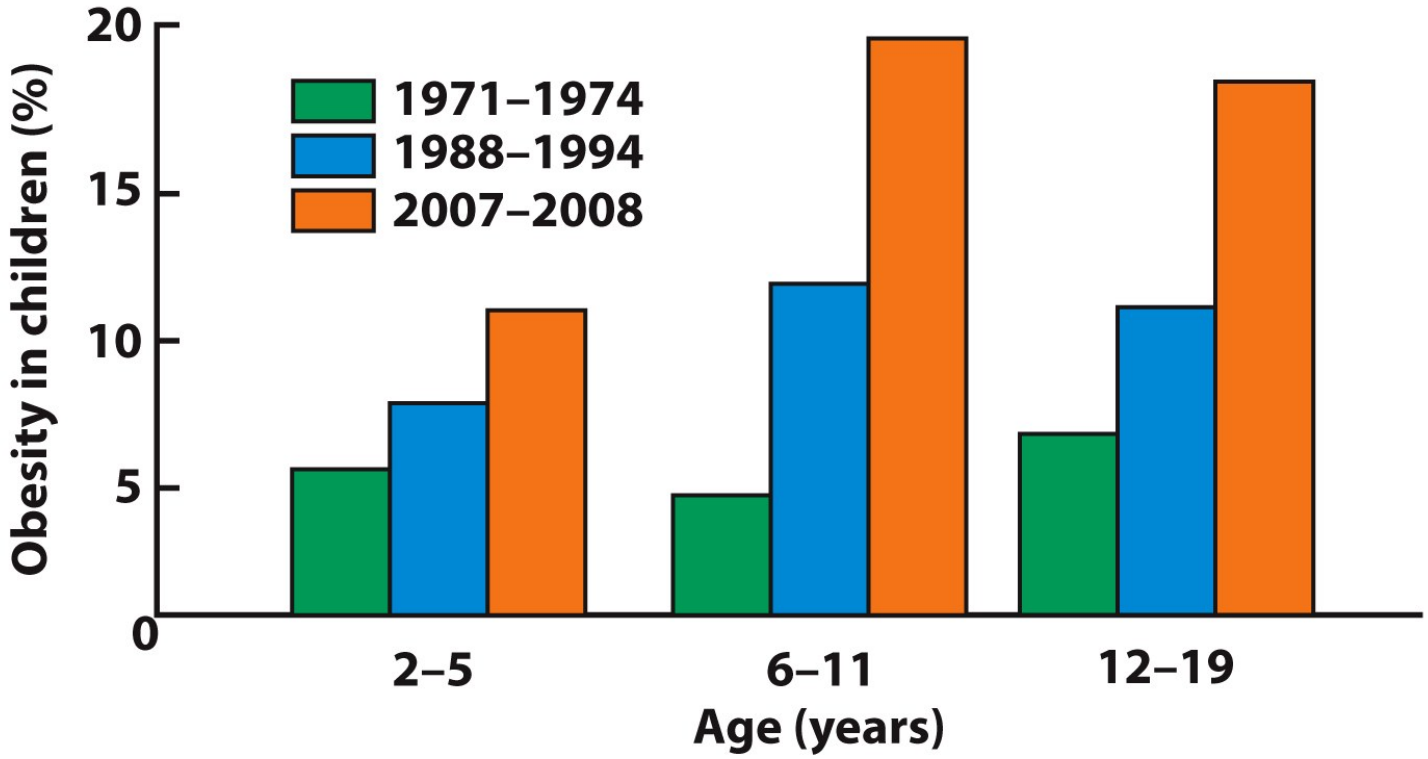
Obesity & children's health



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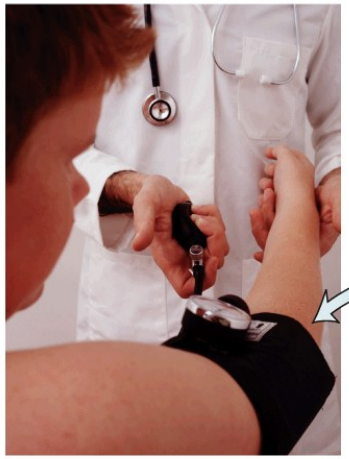
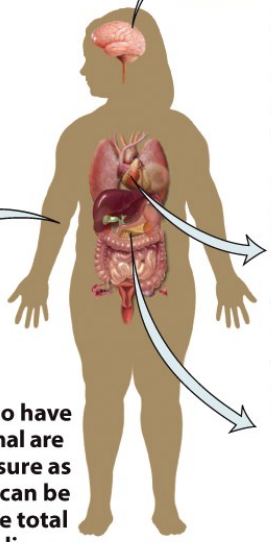
Obesity & children's health

Psychosocial problems: Obese children are more likely than others to be socially isolated and to have depression, poor self-image, and low self-esteem. Social isolation, in turn, results in boredom, depression, inactivity, and withdrawal—all of which can increase eating and decrease activity, worsening the problem.





Elevated blood cholesterol: The American Academy of Pediatrics recommends blood cholesterol monitoring for children and teenagers with a family history of heart disease or high blood cholesterol.[22]

Cholesterol levels in children and adolescents 2 to19 years old[21]

	Total cholesterol (mg/100 mL)	LDL cholesterol (mg/100 mL)
Acceptable	< 170	< 110
Borderline	170 –199	110 –129
High	≥ 200	≥ 130

Elevated blood pressure: Children who have blood pressure at the high end of normal are more likely to develop high blood pressure as adults. As with adults, blood pressure can be affected by the amount of body fat, the total pattern of dietary intake, including sodium intake, and activity level.

Type 2 diabetes: The longer an individual has diabetes, the greater the risk of complications thatcan lead to blindness, kidney failure, heart disease or amputations (see Chapter 4).[20]

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Addressing excess childhood weight

- Change both eating and activity patterns
  - Weight loss is rarely recommended
  - Slow weight gain to allow them to “grow into” weight
  - Denying food may promote further overeating; restrictions should be relatively mild
  - Offer nutrient-dense foods
  - Physical activity for at least an hour per day
  - Increases in activity need to be gradual
  - Start by limiting screen time

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Influence of television

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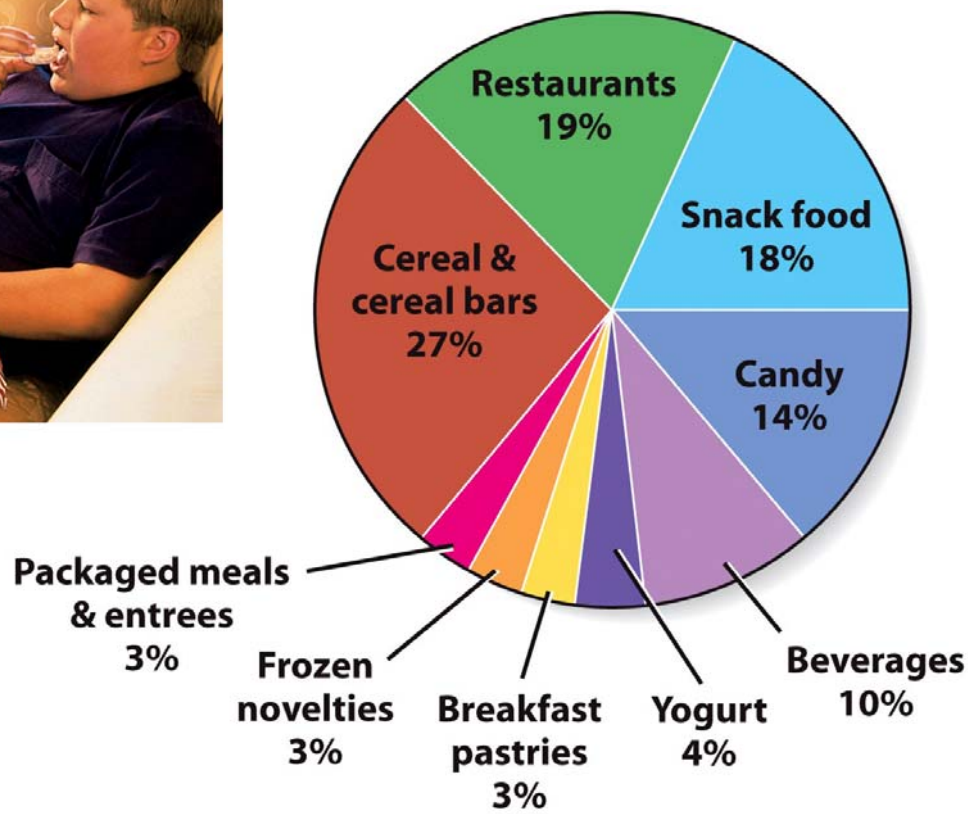

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Preventing dental caries (cavities)

- Primary teeth guide the growth of the permanent teeth
- Diet high in sugary foods promotes the formation of dental caries
  - Soft drinks and other sweetened beverages sipped slowly between meals increases duration of contact between sugar and bacteria on the surface of the teeth, increasing risk of tooth decay

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Hyperactivity

- Involves extreme physical activity, excitability, impulsiveness, distractibility, short attention span, and low tolerance for frustration
- More difficulty learning but usually children are of normal or above-average intelligence
- Part of a larger syndrome known as attention-deficit/hyperactivity disorder (ADHD)

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Hyperactivity causes

- Misconception: caused by eating sugar - not supported by research findings
- Other possible causes: caffeine consumption, lack of sleep, overstimulation, desire for more attention, or lack of physical activity
- Insufficient evidence for dietary treatment of ADHD; some children are sensitive to specific additives and may benefit from a diet that eliminates them

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Lead toxicity

- Environmental contaminant in air pollution, old house paint, plumbing, ceramics
- Toxic, especially in children under age 6
  - Accumulates in bones, brain, teeth, kidneys
  - Disrupts nervous system functioning, causing learning disabilities and behavior problems
  - Contributes to iron-deficiency anemia, kidney and nervous system changes, seizures, coma, death
  - Effects are permanent; iron can be removed medically if detected early

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Concept check

- How do children's energy and protein requirements change as they age?
- What factors affect children's food choices?
- What health risks are associated with obesity in children?

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Nutrition for adolescents

- Organ systems develop and grow, puberty occurs, body composition changes
- Changes with sexual maturation and social and psychological changes in adolescence influence nutrient intakes
- DRIs for two adolescent groups: 9–13 and 14–18 with separate recommendations for boys and girls because their needs begin to differ during adolescent years

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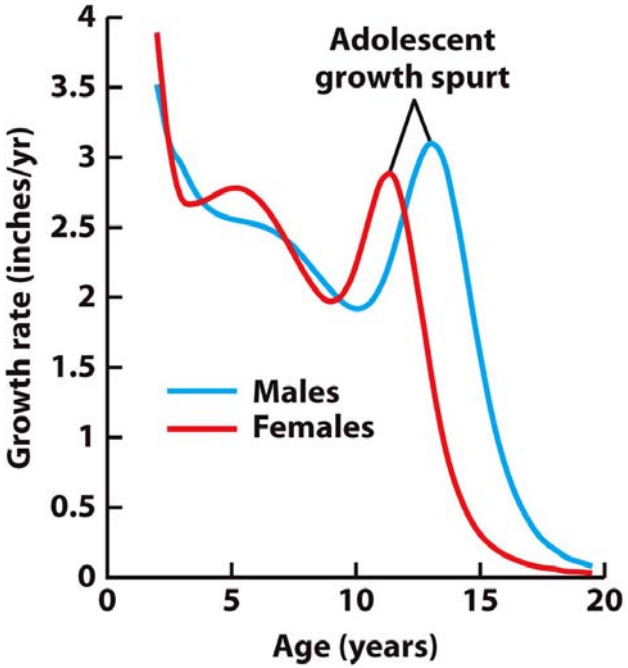
Nutrition for adolescents



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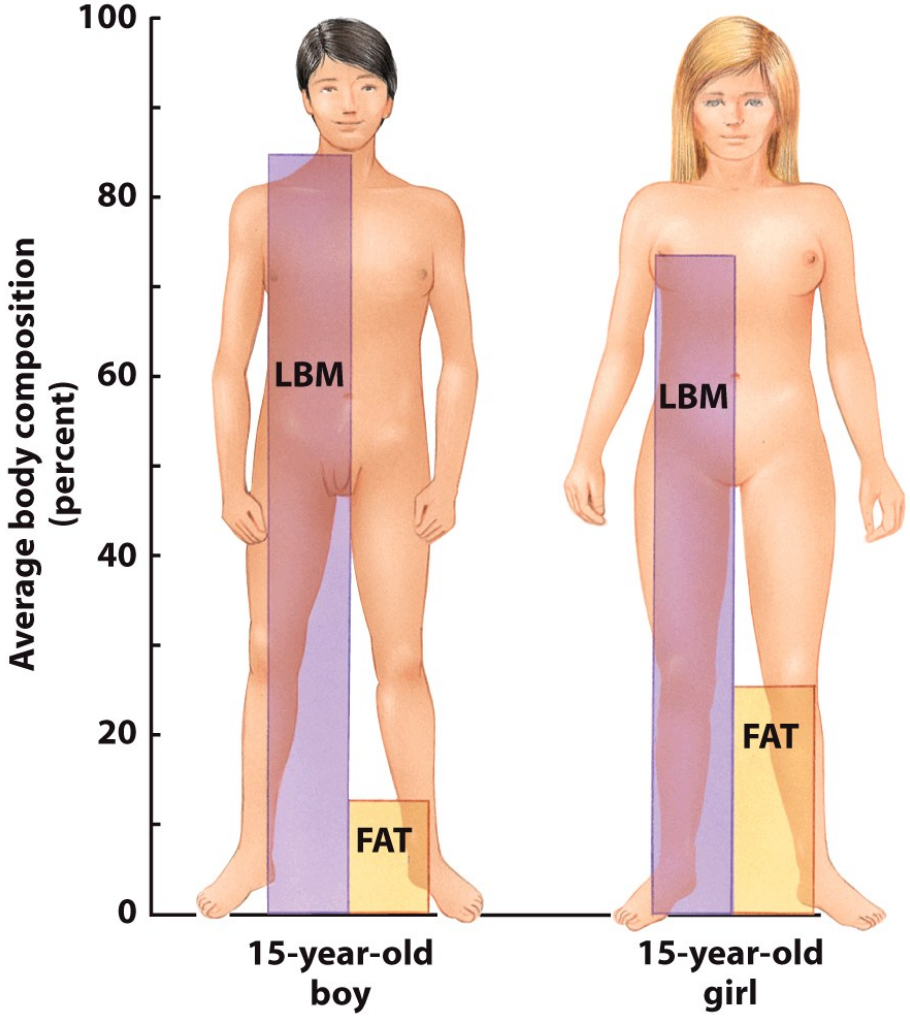

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Nutrient needs of adolescents

- Calories: energy needed usually exceeds adults; boys require more energy than girls due to more muscle and larger bodies
- Protein: requirements per kilogram of body weight same for boys and girls; boys require more total protein because they are heavier
- Proportions of calories from carbohydrate, fat, and protein recommended similar to adults

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Nutrient needs of adolescents

- B vitamins: recommendations much higher in adolescence than childhood due to higher energy needs

- Iron: RDA = 11 mg/day for boys and 15 mg/day for girls ages 14–18
  - Need rises between childhood and adolescence
  - Blood volume expands faster in boys requiring more iron, however, menstruation increases iron losses, making total iron needs greater in girls

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Bone health in adolescents

- Calcium: RDA = 1300 mg/day for everyone between 9–18 years
  - Adequate calcium intake during adolescence is essential for achieving maximum peak bone mass to prevent osteoporosis later in life
- Vitamin D: RDA = 600 IU (15 µg)/day for children, adolescents, and young adults

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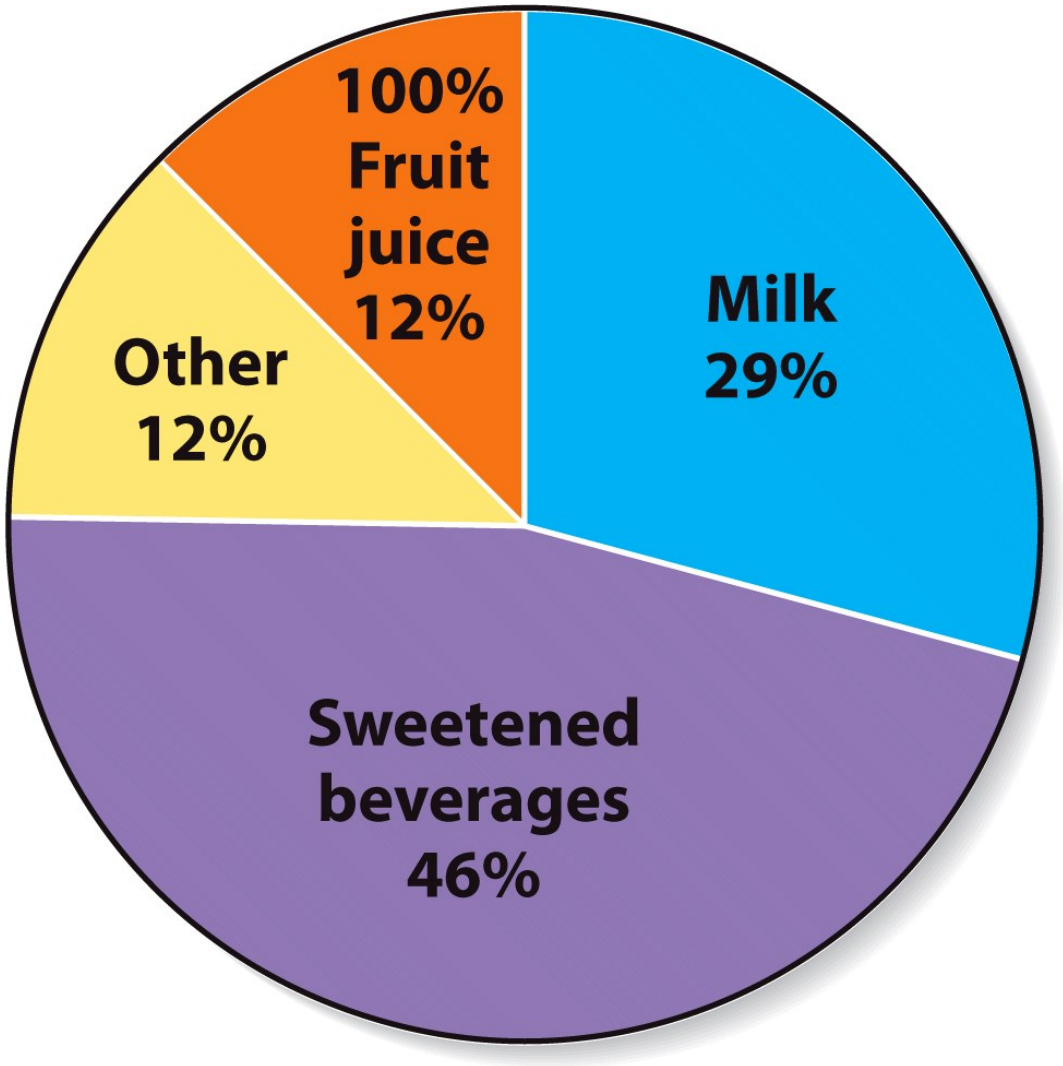
Beverage consumption



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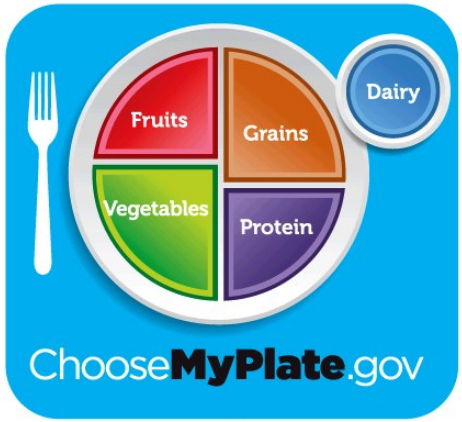
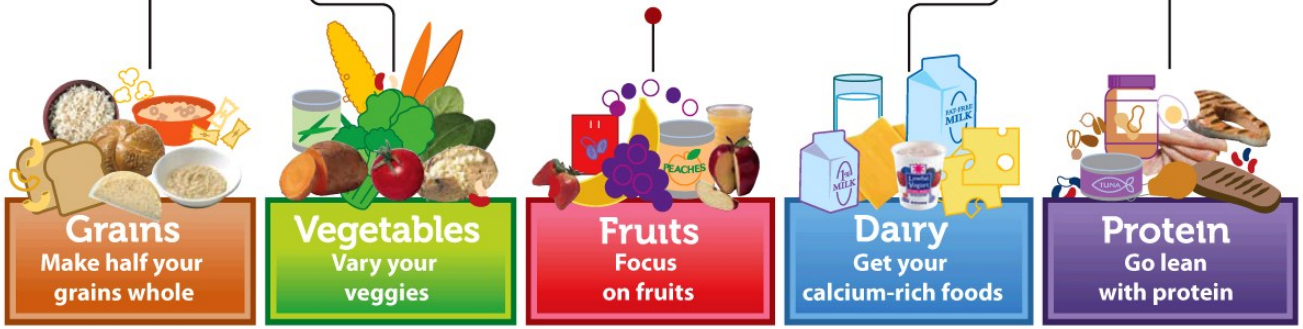
Food guide for adolescents





Food group	Grains Make half your grains whole	Vegetables Vary your veggies	Fruits Focus on fruits	Dairy Get your calcium-rich foods	Protein Go lean with protein
Amount for an 11-yr-old male	7 ounces	3 cups	2 cups	3 cups	6 ounces
Amount for an 11-yr-old female	6 ounces	2½ cups	2 cups	3 cups	5½ ounces
Amount for an 18-yr-old male	10 ounces	4 cups	2½ cups	3 cups	7 ounces
Amount for an 18-yr-old female	8 ounces	3 cups	2 cups	3 cups	6½ ounces

choosemyplate.gov

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What should I eat in adolescence?

- Balance unhealthy choices with healthy ones
- Eat breakfast
- Snack well
- Count up your calcium

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Make healthier fast-food choices

Make healthier fast-food choices Table 12.2

Instead of . . .	Choose . . .
Double-patty hamburger with cheese, mayonnaise, special sauce, and bacon	Regular single-patty hamburger without mayonnaise, special sauce, and bacon
Breaded and fried chicken sandwich	Grilled chicken sandwich
Chicken nuggets or tenders	Grilled chicken strips
Large french fries	Baked potato, side salad, or small order of fries
Fried chicken wings	Broiled skinless wings
Crispy-shell chicken taco with extra cheese and sour cream	Grilled-chicken soft taco without sour cream
Nachos with cheese sauce	Tortilla chips with bean dip
12-in. meatball sub	6-in. turkey breast sub with lots of vegetables
Thick-crust pizza with extra cheese and meat toppings	Thin-crust pizza with extra veggies
Donut	Cinnamon and raisin bagel with low-fat cream cheese

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Vegetarian diets

- Can be a healthy choice when carefully planned to meet nutrient needs; a poorly-planned vegetarian diet will be no healthier than any other poorly-planned diet
- Meatless diets can be low in iron and zinc
- Vegans may be at risk for a vitamin B_{12} deficiency and inadequate calcium and vitamin D intake

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Healthy vegetarian choices

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Special concerns for adolescents

- Eating disorders
- Athletics: increased nutrient needs
  - Steroids can stunt growth in adolescence and cause sexual and reproductive disorders, heart disease, liver damage, acne, and aggressive, violent behavior
  - Weight restriction may affect nutritional status and maturation and increase eating disorder risk
  - Female athlete triad

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Smoking in adolescents

- Increases the risk of cardiovascular disease and lung cancer
- Can limit appetite (may start smoking to control weight and resist quitting due to fear of weight gain)
- May consume more saturated fat and fewer fruits and vegetables, further increasing risk of heart disease and cancer

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Alcohol in adolescents

- Binge drinking: ≥ 5 drinks in a row for men or ≥ 4 in a row for women in about 2 hours
  - Blood alcohol ≥ 0.08 grams percent (mg/100ml)
  - Leads to risk-taking behaviors and blood alcohol levels causing loss of consciousness, coma, death
- Alcohol + energy drinks is dangerous
  - Caffeine's stimulant effect counters alcohol's depressant effects; judgment and motor function are still impaired so drunk person does not feel drunk

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Concept check

- How does puberty affect body composition in males and females?
- How do the energy needs of teens compare with those of adults?
- What factors contribute to low calcium intake in teens?
- What could a teen choose at a fast food restaurant to boost vegetable intake?

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Life expectancy

- Average length of life for a population
  - In the US = 77.9 years
  - Healthy life expectancy is only about 70 years; on average // last 8 years restricted by disease and disability
- Goal of successful aging: increase life expectancy AND healthy life expectancy
  - Important for individual, family members, and insurance and public health programs
  - Healthy diet can delay onset of chronic diseases

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Aging population

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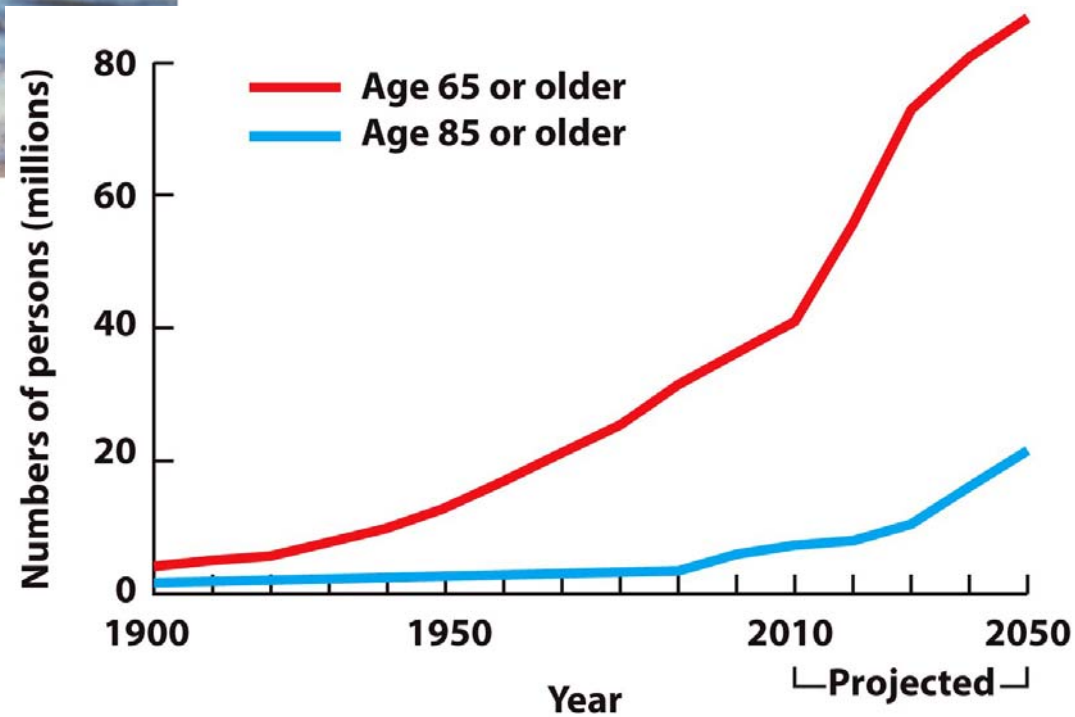

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Aging

- Accumulation of changes associated with and responsible for an ever-increasing susceptibility to disease and death
- Loss of cells and cell function occurs throughout life, but effects are not felt for many years because organisms start with more cells and cell function than needed
- Reduced ability to repair damage and resist infection

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Life span

- Maximum age to which members of a species can live
- Human = about 120 years
- How long individuals live and rate of aging determined by genes, lifestyle, and avoiding
- accidents, disease, and environmental toxins

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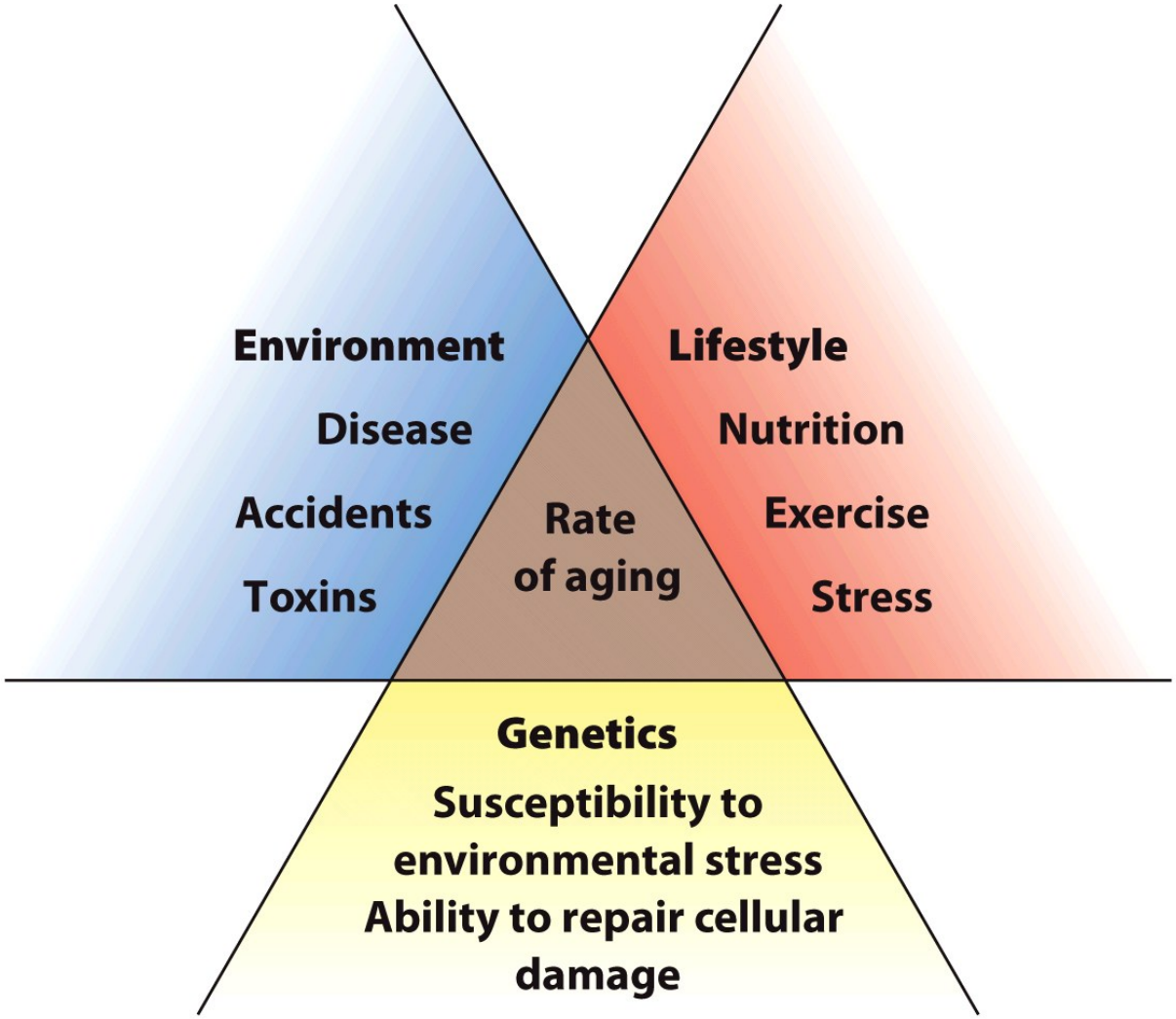
Aging



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Nutrition for adults

- DRIs include four adult age groups
  - Young adulthood (ages 19–30)
  - Middle age (ages 31–50)
  - Adulthood (ages 51–70)
  - Older adulthood (over age 70)

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Nutrient needs of older adults

- Calories: energy needs decline with age, due primarily to decreases in BMR and activity level
- Need for most nutrients does not change
  - To meet nutrient needs with lower energy needs, older adults must consume a nutrient-dense diet
- Proportions of calories from carbohydrate, fat, and protein recommended similar to younger adults

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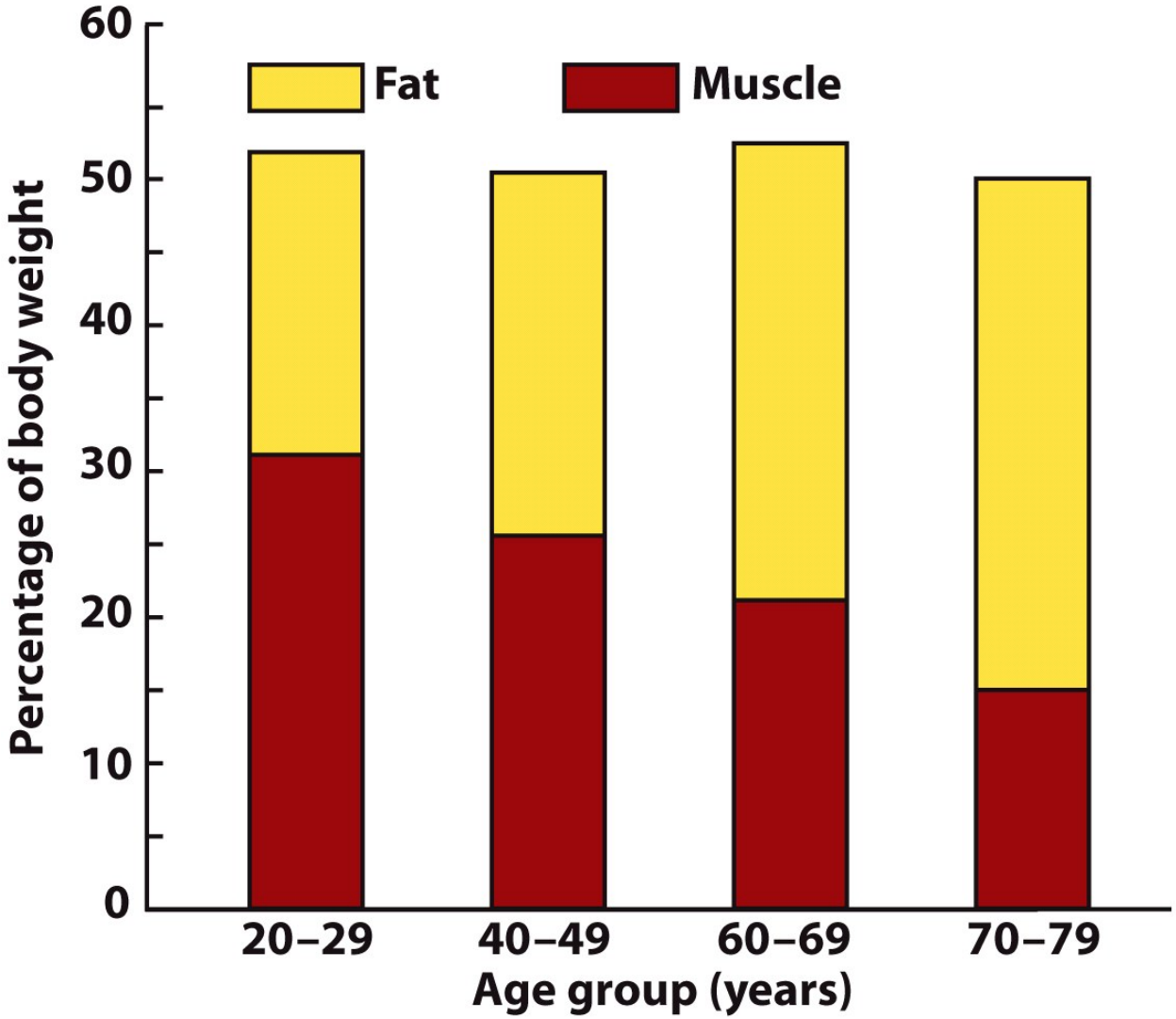
Nutrient needs of older adults



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Nutrient needs of older adults

- Vitamin B_6: RDA is greater in adults $\geq$ 51 years vs. younger adults because higher dietary intakes needed to maintain same function

- Vitamin B_{12}: recommended that people $\geq$ 50 consume fortified foods or supplements; food-bound vitamin B_{12} is not absorbed efficiently due to atrophic gastritis, an inflammation of the stomach lining causing reduced stomach acid

-
  - Reduces iron, folate, calcium, vitamin K absorption

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Nutrient needs of older adults

- Iron: RDA for women ≥ 51 year = 8 mg; same as adult men of all ages

- Calcium: RDA for men ≥ 51 years = 1000 mg/day; RDA for women ≥ 51 years and men and women > 70 years = 1200mg/day // Increased bone loss after menopause

- Vitamin D: RDA for ≥ 51 years = 600 IU (15 µg) /day, the same as for other ages; RDA for adults > 70 years = 800 IU (20 µg) /day

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Increased risk of malnutrition

- Decreasing muscle size and strength increases risk of falls and fractures and physical frailty
- Declining immune system increases infections, cancers, and autoimmune diseases, and decreases effectiveness of immunizations
- Chronic conditions change nutrient requirements, decrease appeal of food, and impair ability to obtain and prepare adequate diet

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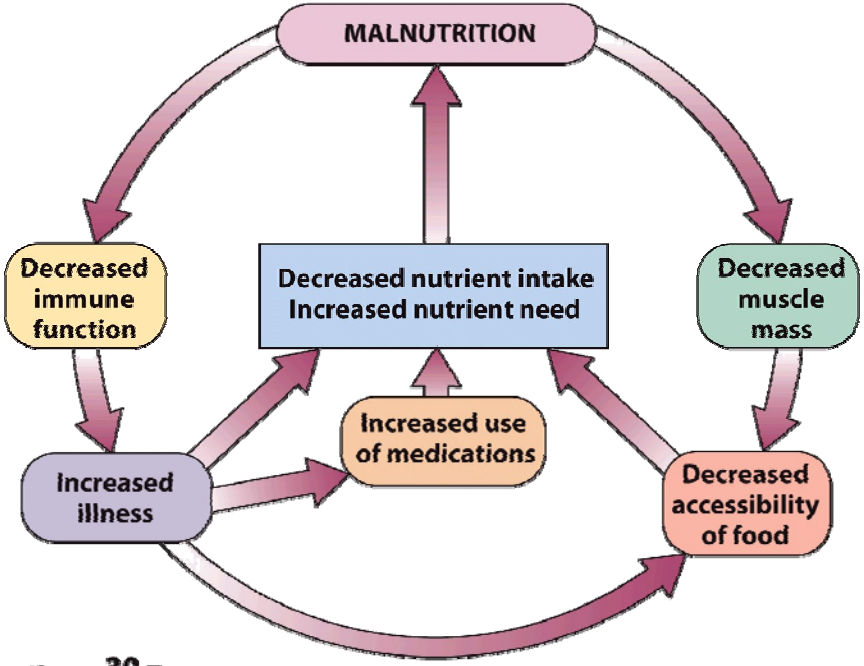
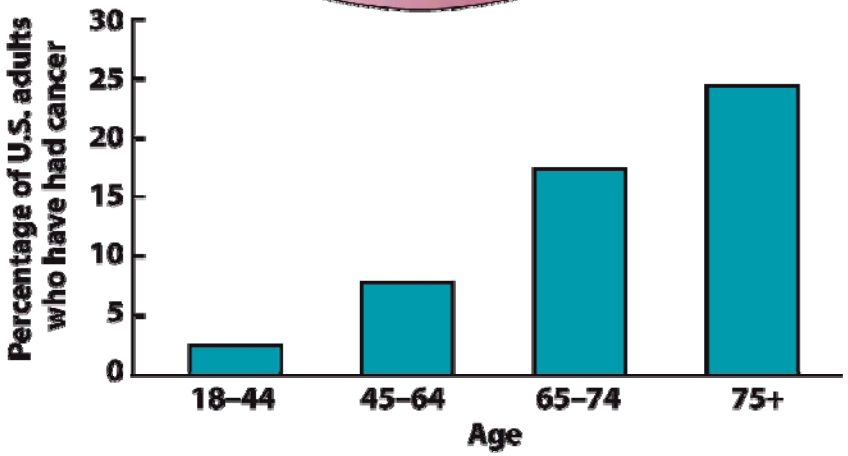
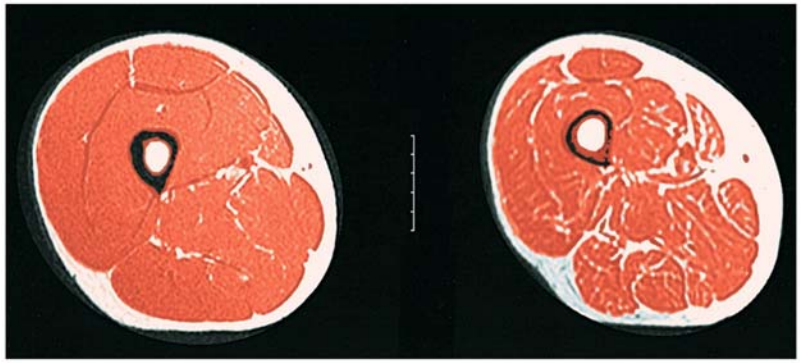
Malnutrition in older adults







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Physical problems & malnutrition

- Arthritis: inflammation of the joints, pain, and sometimes changes in structure
- Declining vision:
  - Macular degeneration: reduction of viable cells in the macula, area of retina that distinguishes fine detail
  - Cataracts: clouding of the lens of the eye
  - Both thought to be caused by oxidative damage; prevent/slow with diets high in antioxidants and phytochemicals

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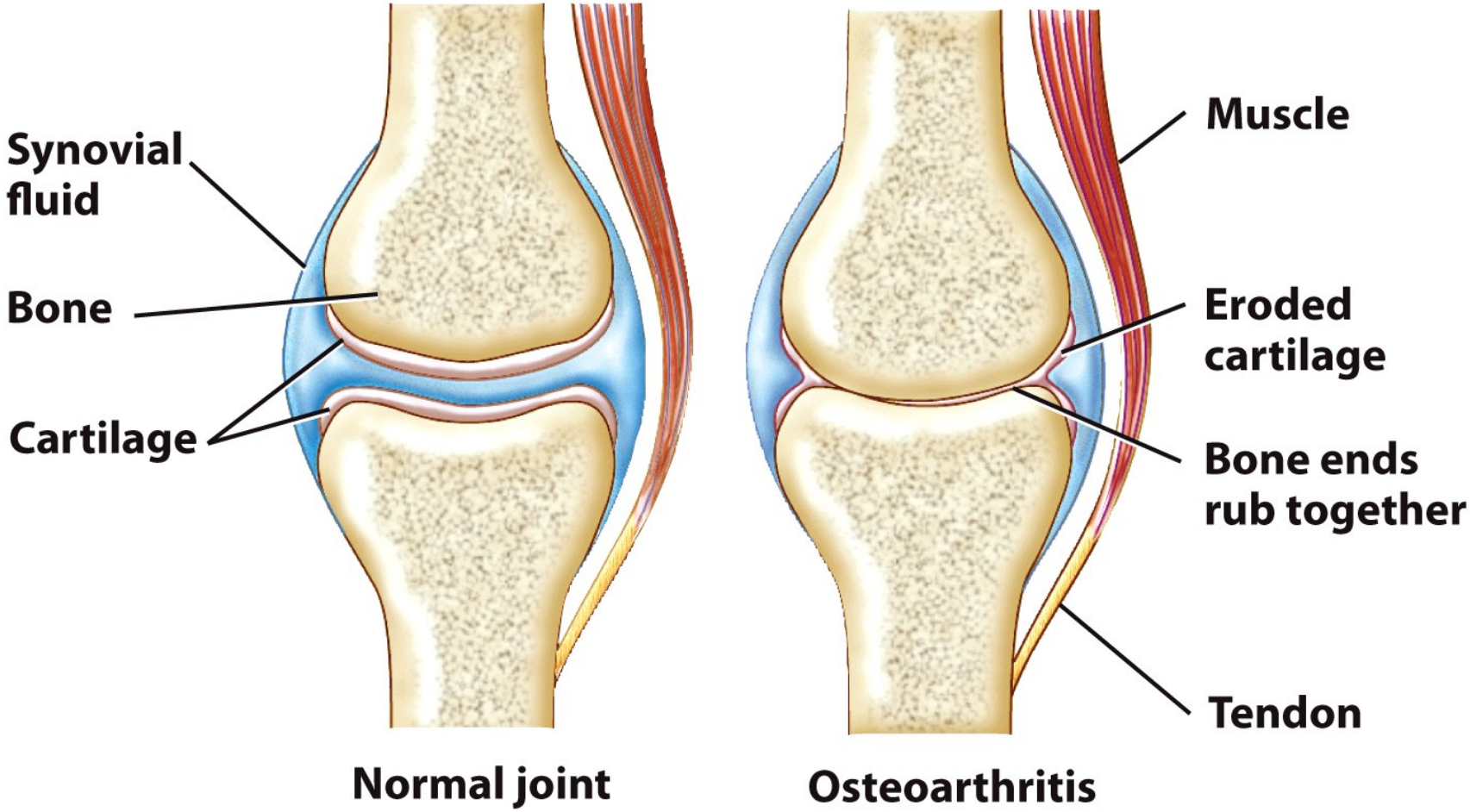
Osteoarthritis



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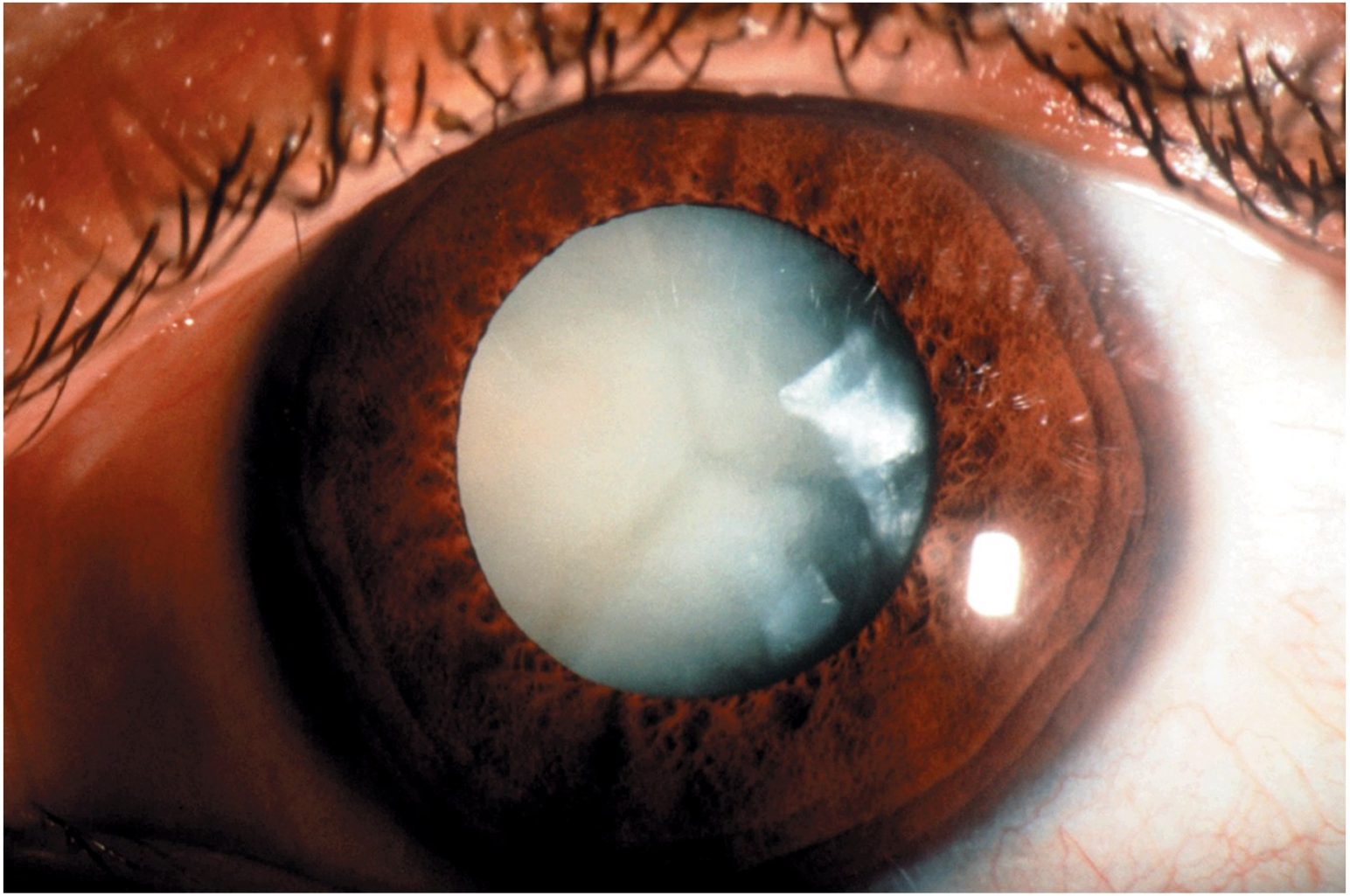
Cataracts



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Decreased mental status & malnutrition

- Dementia: impaired memory, thinking, or judgment severe enough to cause personality changes and affect daily activities and relationships with others
  - Causes include multiple strokes, alcoholism, dehydration, medication side effects, vitamin B_{12} deficiency, and Alzheimer's disease
- Depression

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Increased risk of malnutrition

- Medication side effects can affect nutritional status (for example, decreased appetite, changes in taste, and nausea) and diet can change medication effectiveness

- Many older adults live below the poverty level and/or on a fixed income, making it difficult to afford health care and a healthy diet
  - Food insecurity: limited availability of nutritionally-adequate, safe food or ability to acquire food in socially-acceptable ways

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Health during adult years

- Nutritious diet can extend an individual's years of healthy life by preventing malnutrition and delaying onset of chronic diseases
- Regular exercise can help maintain muscle mass, bone strength, and cardiorespiratory function, helping to prolong independent living
- Food-assistance programs or assisted living can help prevent food insecurity

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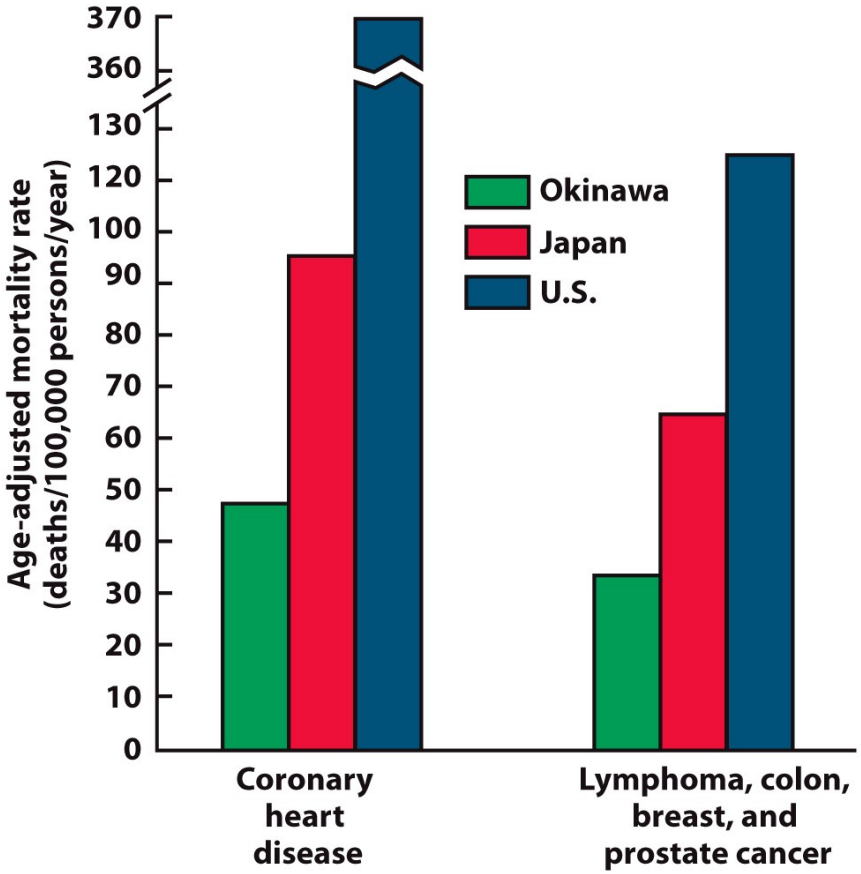
Debate

Can eating less make you live longer?

Ana Nance/Redux Pictures



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Identifying older at-risk adults

- Federal Nutrition Screening Initiative promotes screening for and intervention with nutrition-related problems in older adults
  - To increase awareness of nutritional problems among the elderly by involving practitioners, community organizations, relatives, friends, and others caring for the elderly in evaluating the nutritional status of the aging population
  - Developed the DETERMINE checklist to determine when malnutrition is a potential problem

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DETERMINE checklist

DETERMINE: A checklist of the warning signs of malnutrition Table 12.3

Disease	Any disease, illness, or condition that causes changes in eating can predispose a person to malnutrition. Memory loss and depression can also interfere with nutrition if they affect food intake.
Eating poorly	Eating either too little or too much can lead to poor health.
Tooth loss/mouth pain	Poor health of the mouth, teeth, and gums interferes with the ability to eat.
Economic hardship	Having to, or choosing to, spend less than $25 to $30 per person per week on food interferes with nutrient intake.
Reduced social support	Not having contact with people on a daily basis has a negative effect on morale, well-being, and eating.
Multiple medicines	The more medicines a person takes, the greater the chances of side effects such as weakness, drowsiness, diarrhea, changes in taste and appetite, nausea, and constipation.
Involuntary weight loss or gain	Unintentionally losing or gaining weight is a warning sign that should not be ignored. Being overweight or underweight also increases the risk of malnutrition.
Needs assistance in self-care	Difficulty walking, shopping, and cooking increases the risk of malnutrition.
Elder above age 80	The risks of frailty and health problems increase with increasing age.

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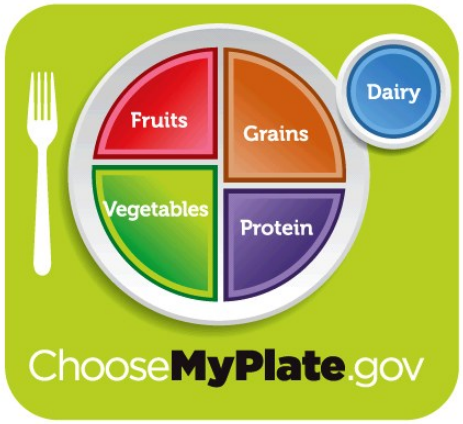
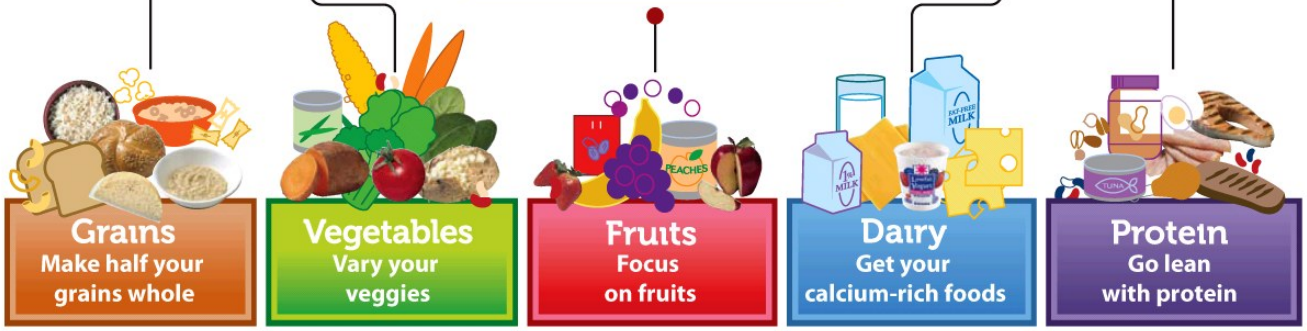
Food guide for older adults





Food group	Grains Make half your grains whole	Vegetables Vary your veggies	Fruits Focus on fruits	Dairy Get your calcium-rich foods	Protein Go lean with protein
Amount for a 50-yr-old male	7 ounces	3 cups	2 cups	3 cups	6 ounces
Amount for a 50-yr-old female	6 ounces	2½ cups	1½ cups	3 cups	5 ounces
Amount for a 70-yr-old male	6 ounces	2½ cups	2 cups	3 cups	5½ ounces
Amount for a 70-yr-old female	5 ounces	2 cups	1½ cups	3 cups	5 ounces

choosemyplate.gov

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Keeping healthy

- Use precooked foods, frozen dinners, canned soup, dry soup mixes, and medical nutritional products (for example, Ensure or Boost)
- Regular physical activity can extend years of active, independent life, reduce risk of disability, and improve quality of life
  - Physical activity program should improve endurance, strength, flexibility, and balance
  - Recommendations same as younger adults

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Keeping healthy

Ira Block/NG Image Collection

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Keeping healthy

- Provide education about economics and food preparation or assistance with shopping and food preparation and reduced-cost meals
- Assisted-living facilities provide help as needed with daily activities such as eating, bathing, housekeeping, taking medications
- Even though nursing homes provide access to food and medical care, residents are at increased risk for malnutrition

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Concept check

- What is the goal of successful aging?
- How do the energy needs of older adults compare to those of younger adults?
- Why are older adults at risk for malnutrition?
- Where can older adults get assistance in meeting their nutrient needs?

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Alcohol

- Can reduce nutrient intake and affect storage, mobilization, activation, metabolism
- Breakdown produces toxic compounds that damage tissues, particularly the liver
- Moderate alcohol consumption:
  - $\leq$ 1drink/day for women and $\leq$ 2 drinks/day for men
  - 1 drink = 5 oz of wine, 12 oz of beer, or 1.5 oz of distilled spirits
  - Provides some health advantages

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Alcohol

Andy Washnik

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Alcohol

- Any molecule that contains an -OH group
- Term used to refer to ethanol and beverages containing ethanol
- Ethanol: small molecule produced by yeast fermentation of sugar

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Alcohol absorption & distribution

- Rapidly and almost completely absorbed in upper gastrointestinal tract
  - Some absorbed from the stomach to produce immediate effects; food slows absorption
- Enters bloodstream and is rapidly distributed
  - Peak blood alcohol concentrations approximately 1 hour after ingestion; affected by kind and quantity of alcoholic beverage consumed, speed of beverage consumption, food consumed, weight and gender, and alcohol-metabolizing enzymes

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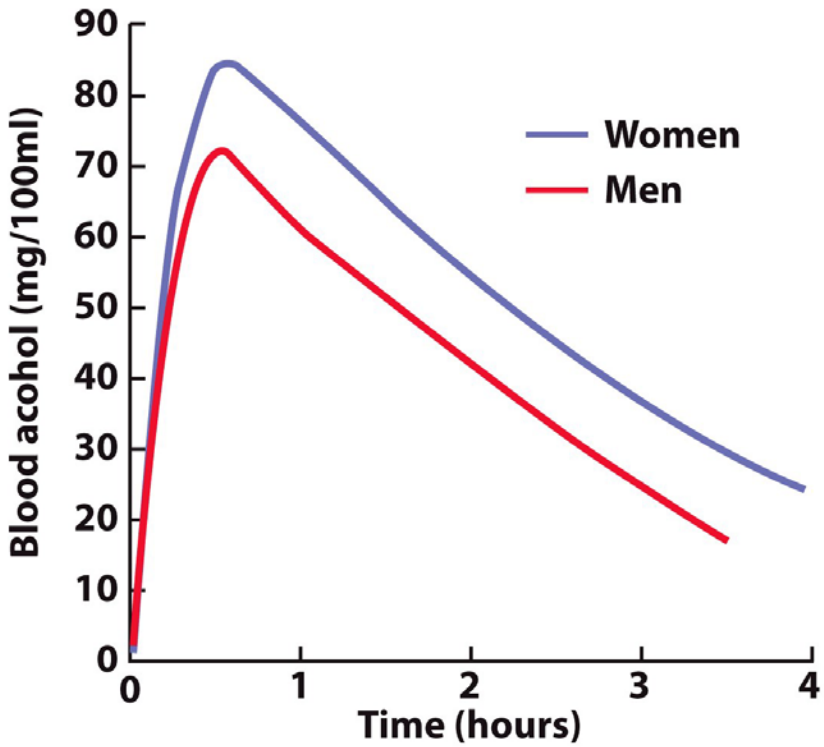
Blood alcohol concentration



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Alcohol metabolism & excretion

- Alcohol travels to the liver, where it is given metabolic priority and broken down before other molecules
  - About 90% of alcohol is metabolized by the liver
- Remainder excreted through urine or eliminated via the lungs
- Acts as a diuretic, increasing fluid excretion and contributing to dehydration

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Alcohol metabolism & excretion

- Most alcohol is broken down by the liver enzyme ADH (alcohol dehydrogenase)
  - Also found in all parts of the gastrointestinal tract
  - ADH breaks down alcohol at a fairly constant rate
- With greater amounts of alcohol, MEOS (microsomal ethanol-oxidizing system) also metabolizes alcohol in the liver
  - As MEOS activity increases with high alcohol intake, metabolism of other drugs can change

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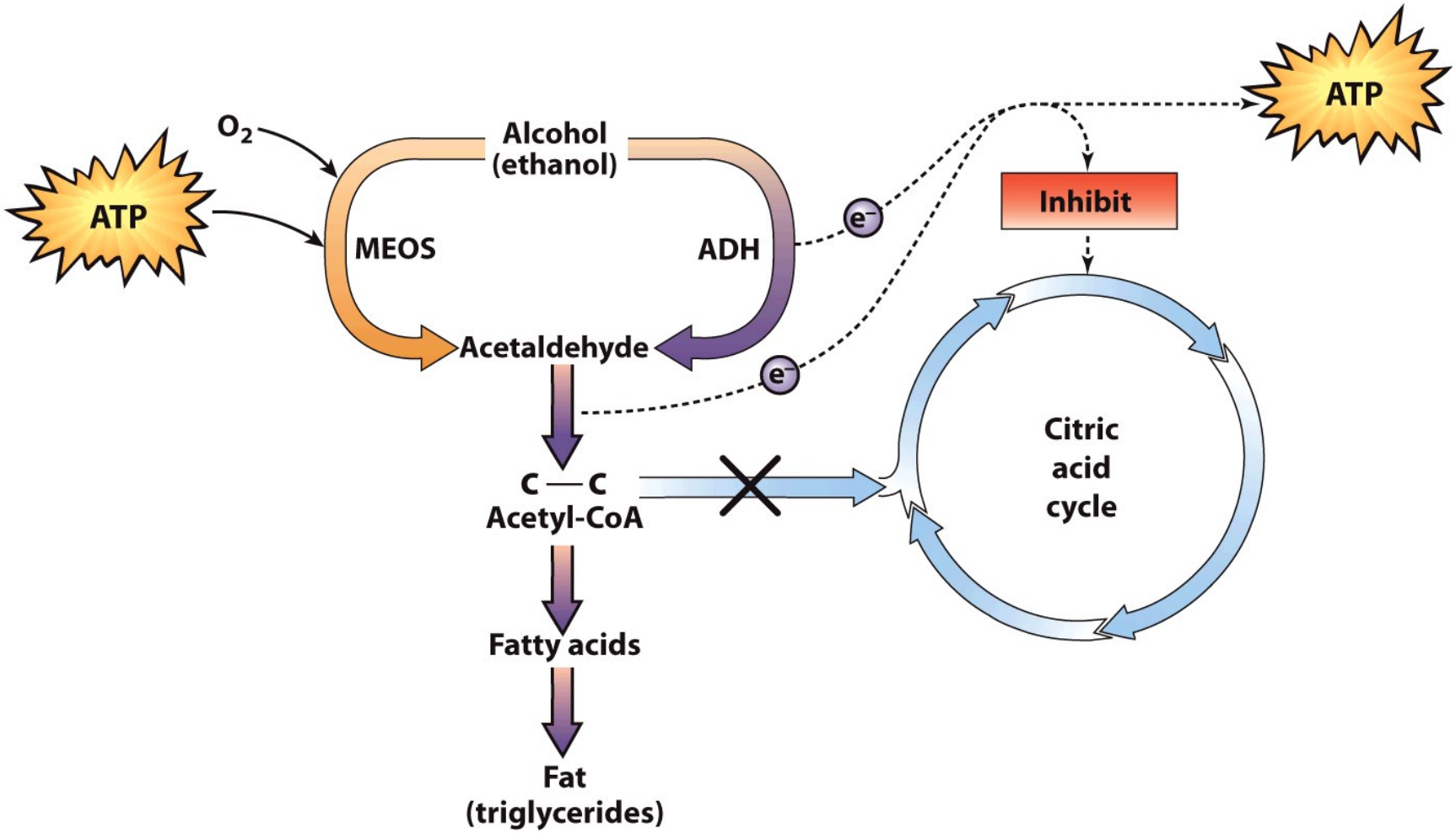
Alcohol metabolism



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Short-term effects of alcohol

- Depressant; impairs mental & physical abilities
  - First: affects reasoning
  - Then: vision and speech centers are affected
  - Next: impairs large muscles causing lack of coordination
  - Finally: can result in alcohol poisoning which can slow breathing, heart rate, and the gag reflex, loss of consciousness, choking, coma, death
- Blackout drinking: drinking enough alcohol to cause amnesia

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Alcoholism

- Physiological condition that needs treatment
- Risk increased if drinking started younger
- Likely a genetic component making some more likely to become addicted
- Environmental factors also play a significant role

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Alcoholic liver disease

- ADH metabolism promotes fat synthesis, leading to fat accumulation in the liver
- MEOS metabolism generates reactive oxygen molecules, causing oxidation of lipids, membrane damage, altered enzyme activities
- ADH or MEOS metabolism forms acetaldehyde
  - Binds proteins and inhibits chemical reactions and mitochondrial function, allowing more acetaldehyde to accumulate causing more liver damage

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3 types of alcoholic liver disease

- Fatty liver: accumulation of fat in liver cells; occurs in almost all who drink heavily
- Alcoholic hepatitis: inflammation of the liver caused by continued alcohol consumption
  - Both are reversible if alcohol is stopped and good nutritional and health practices are followed
- Cirrhosis: chronic and irreversible liver disease with loss of functioning liver cells and accumulation of fibrous connective tissue

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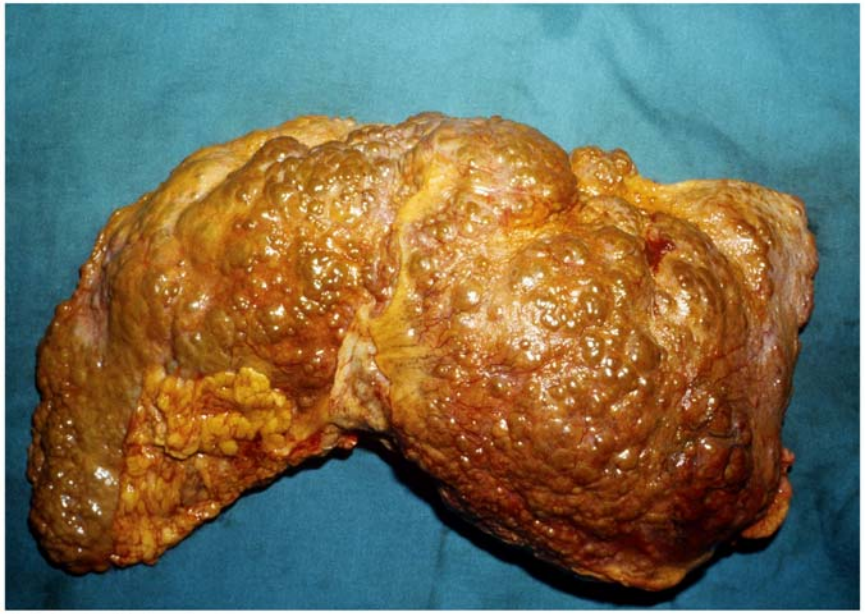
Alcoholic cirrhosis

Martin M. Rotker/Photo Researchers, Inc.



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Alcohol & health problems

- Heavy drinking associated with cancer of the oral cavity, pharynx, esophagus, larynx, breast, liver, colon, rectum, and stomach
- Moderate alcohol consumption can increase risks of certain cancers in women, violence, drowning, and injuries from falls and motor vehicle crashes
- Alcohol use increases risks of hypertension, heart disease, and stroke

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Benefits of alcohol

- Can stimulate appetite, improve mood, and enhance social interactions
- Light to moderate drinking reduces risks of heart disease and stroke
  - Raises HDL cholesterol and inhibits blood clots
  - Phytochemicals in red wine are thought be more cardioprotective than other alcoholic beverages
  - Consuming alcohol with meals slows absorption and may enhance cardiovascular protective effects

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Benefits of alcohol

- Moderate alcohol consumption associated with reduced risk of death among middle-aged and older adults and may help to keep cognitive function intact with age

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Consumption of alcohol

- Alcohol should be consumed slowly; no more than one drink every 1.5 hours
- Sipping, not gulping, allows the liver time to break down what has already been consumed
- Alternating nonalcoholic and alcoholic drinks will also slow down the rate of alcohol intake and prevent dehydration

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Concept check

- How much beer per day constitutes moderate drinking for a man?
- How can alcohol metabolism lead to fatty liver?
- What are the symptoms of alcohol poisoning?
- How does moderate alcohol intake reduce the risk of cardiovascular disease?

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What is happening in this picture?

Bruce Dale/NG Image Collection

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What are similarities and differences between:

- Nutrition in infants and adults?
- Nutrition in teenagers and adults?
- Nutrition in young and older adults?

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Nutrition in the news

- Sugar consumption in children
- High-fructose corn syrup
- Vending machines in schools
- Eating fast food by children and teenagers
- Prevention of chronic diseases with nutrition and lifestyle
- Binge drinking in college
- Health benefits of alcohol

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Checking student learning outcomes

- What advice could you give to a loved one who has an infant?
- What advice could you give to a loved one who has a teenager?
- What advice could you give to a loved one who is older?

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