

Geriatric Nutrition

Carolyn Bedoian, MHA
 Program Manager,
 Department of Public Health and
 Pediatric Dentistry

Nutritional Challenges

- Nutritional Requirements
- Establishing Nutrient Rates
- Instutionalized & Home Bound Population
- Adequate Dietary Intake
- Disabilities and Aging

Nutritional Requirements

- ◉ Uncertainties due to co-morbidities
- ◉ Healthy Heterogeneous Population
- ◉ Nutrient Requirements charts

Optimal Calcium Requirements
 U.S. Recommended Daily Intake (RDI)
 U.S. National Institute of Health Consensus Statement - 1997

Group	RDI milligrams of elemental calcium
Infants	
Birth - 1 month	400
1 month - 1 year	600
Children	
1 - 3 years	500
4 - 10 years	800 - 1,200
Adults/Young Adults	
11 - 24 years	1,200 - 1,500
Men	
25 - 50 years	1,000
Over 50 years	1,500
Women	
25 - 50 years	1,000
Pregnant or Nursing	1,200 - 1,500
Over 50 years	1,500
Postmenopausal with supplemental estrogen	1,000
Postmenopausal without supplemental estrogen	1,500
Over 60 years	1,500

Dietary Reference Intakes for Older Adults

- ◉ National Policy and Resource Center on Aging, Florida International University
 - Recommended Dietary Allowances (RDA)
 - Reference Daily Intake (RDI)
 - Adequate Intakes (AI)
 - Tolerable Upper Intake Levels
 - Age 51-70 male/female
 - Age 70+ male/female

Physiological Changes

- ◉ Decrease in total body protein
- ◉ Decrease in total body water
- ◉ Bone density loss/Osteoporosis
Can be a problem in male
- ◉ Body fat increases
w/redistribution of fat stores



Systemic Changes

- ◉ Enamel on teeth thins
- ◉ Sensitivity to temperature
- ◉ Tooth loss (dentures)
- ◉ Dry mouth
- ◉ Esophageal motility
- ◉ Gastric acids reduced
- ◉ Slower stomach emptying
- ◉ Decreased liver size
- ◉ Fewer pancreatic enzymes

Systemic Changes: Bowel Function



Nutritional Needs

- ◉ **Kcalories (kcal)**
 - Generally 25-30 kcal/kg/day
 - Activity level impacts
 - Chronic disease
- ◉ **Protein**
 - No decrease in needs may be higher
- ◉ **Water/Fluids**
 - 1 ml/kcal or 30 ml/kg actual body weight

Dietary Intake



- ◉ Promoting a healthy diet for older adults
- ◉ Knowledge gap exists
- ◉ Diet w/exceptions (2005)
 - Persons over 50 vitamin B12
 - Elderly dark skin & exposed to little sun vitamin D

Aging and the Diet

- ◉ **Carbohydrates**
 - 55-60% of diet
 - Emphasis on complex
- ◉ **Protein**
 - 15-20% of diet
 - Once believed decrease w/age
- ◉ **Fat**
 - 10-30% of diet
 - Frail require more
 - Frequent dense meals
 - Overweight low-fat diet
- ◉ **Fiber**
 - ◉ 20-35 grams/day
 - ◉ Colon cancer
 - ◉ Elderly limit fiber

Sodium and Potassium

- ◉ **Sodium**
 - Increased sensitivity to renal function limits the kidneys ability to excrete sodium
 - 55% f/49% m @ 55-64 y
 - 74 f/64 m @ 65-74 y old
 - 84 f/70 m @ 75 y old
 - Less than 4 gms per day
 - Hypertension less than 2 grams per day
- ◉ **Potassium**
 - ~ 4.7 grams per day
 - Renal disease present
 - Unprocessed foods

Micronutrients: Key Vitamins and Minerals

Vitamin B-6	Calcium
Vitamin B-12	Magnesium
Folate	Zinc
Vitamin D	Iron
Vitamin E	
Vitamin K	

Vitamin E

- ◉ Fat soluble -- family of 8 antioxidants
- ◉ Absorbed in upper small intestine (20-70%)
- ◉ Deficiency is extremely rare exception: Crohn's disease, cystic fibrosis & malnutrition
- ◉ Deficiency Causes: impaired balance/coordination, peripheral neuropathy, weakness and retinopathy
- ◉ Toxicity potential very low

Vitamin E

Dietary Reference Intake:
15 ug/d for all adults

- ◉ Low intake/low deficiency
- ◉ Are the DRI's too high?
- ◉ Evidence beneficial in chronic disease
- ◉ Many people supplement



Vitamin K

- ◉ Role in blood clotting & bone health
- ◉ Requirements same all adults
- ◉ Deficiency: hemorrhage –although rare lipid metabolism, chronic antibiotic therapy and liver disease
- ◉ Low intake 30% increase in bone fractures
- ◉ Source: leafy green vegetables, broccoli, cabbage, turnip, egg yoke, liver



Into to Minerals

Calcium, Magnesium, Iron and Zinc



CALCIUM

Role and Consumption

- ◉ Role in bone architecture and numerous essential metabolic activities
- ◉ Several factors associated w/aging – altered calcium balance
- ◉ Decrease in vitamin D absorption



Calcium

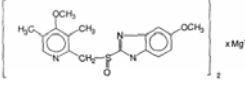
- | PEAK BONE MASS | WITH VITAMIN D |
|--|---|
| ◉ Peak bone mass determinant bone fractures | ◉ Cal (500 mg) and vit D (20 ug) reduces fractures –M/F |
| ◉ Observational studies – postmenopausal woman | ◉ 36 months fractures in study group (6%) in placebo group (13%) in control |
| ◉ Calcium Supp. 500 mg/day > 5 years reduce bone loss no benefit < 5 year. | ◉ Denmark – higher supp. (900mg/day) 16% decline fractures |

Magnesium

BONE MINERAL CONTENT

- ◉ Framingham Heart Study
 - Mean intake of 191 mg/day in women + correlation bone mineral content
 - Men 236 mg/day no correlation
- ◉ SUPPLEMENTATION
 - Too few studies
 - Mg, Ca & estrogen replacement therapy – increased bone mineral density compared to estrogen alone

SARCOPENIA: LOSS OF LEAN TISSUE MASS



Important risk factor for disability and mortality. Insufficient Mg stores can damage muscle cells. Italian Study – muscle strength and circulating Mg improved w/supp.

Zinc


Essential trace mineral

- > 300 enzymes
- Deficiency
 - Alterations in sexual maturations
 - Taste acuity
 - Wound healing
 - Host immune function

30% healthy elderly def. in zinc (Prasad)

- ◉ Cell mediated immunity
 - T-1 and T-2 helper cells response slower w/mild deficiency
 - Reversible w/supp.
- ◉ Factor in development of age-related macular degeneration (AMD)
 - Leading cause of visual impairment of > 65

Iron



- ◉ Requirements decrease w/age
- ◉ Consumption of iron rich foods should be encouraged
- ◉ Deficiency signs:
 - Fatigue
 - Sleeplessness
 - Headaches
 - Anorexia & Nausea

Body Weight in the Older Adult

LOW BODY WEIGHT

- ◉ Anorexia of aging
 - Hypothalamus (feeding drive)
 - Reduced stomach elasticity
 - Delayed gastric emptying
 - Medications
 - Loss of 10 lbs or more in a 6 month period

OVERWEIGHT/OBESITY

- ◉ 2/3 of U.S. Adults are overweight (body mass index > 25)
- ◉ Obesity is BMI > 30
- ◉ Prevalence greater over the past 3 decades
- ◉ Obese Medicare pt. \$1,486
- ◉ More sedentary lifestyle and Diet – higher calorie intake

Recommendations

- ◉ Promoting a healthy diet
- ◉ Knowledge gap treatment of chronic diseases
- ◉ National Cancer Institute, U.S. Dept. Agriculture and American Heart Assoc.

Dietary Supplements



- 40% of elderly take supplements (Radimer)
- Energy below 1600 kcal/day
- 100% DRI (Daily Reference Intake)

Nutrition Interventions

SERVICES AVAILABLE

- ◉ Homebound meal delivery program – subsidized programs
- ◉ Congregate meal programs
 - Does not appeal to all seniors
- ◉ Waiting lists are long
- ◉ Funding limited

BENEFITS

Identifying Risk Factors for Inadequate Food Intake

Nutrition Screening Initiative: American Academy of Family Physicians, the American Dietetic Association and the National Council on the Aging

- ⊙ **Do you sometimes have problems obtaining the food you need?**
 - (could you relate to problems with shopping or lack of money to buy food)
- ⊙ **Do you have any problems that make it difficult to eat?**
 - (may involve chewing, loss of taste, problems with swallowing)
- ⊙ **Do you eat at least two meals a day?**
 - (amount of food eaten)
- ⊙ **Have you gained or lost 10 lbs. over the last 6 months?**
 - (involuntary weight loss or unwanted weight gain)

References of value and used in this presentation

- ⊙ http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=3&tax_subject=256&topic_id=1342&level3_id=5140
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Thank You!

