Age related changes in food intake, weight and body composition

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Objectives

- Understand age related changes in appetite and food intake
- Discuss age related changes in weight and body composition.
- Define 'significant weight loss' and understand its association with morbidity and mortality.
- Discuss the causes of weight loss in Older adults.
Appetite and Food Intake with increasing age

- Less hungry and eat less
- More full before meals
- Consume smaller meals slowly
- Eat fewer snacks between meals
- Become more rapidly satiated
- Consume less varied and more monotonous food

Body weight

- Mean BMI declines after age 60
- Prevalence of underweight increases

BMI

BMI associated with maximum life expectancy increases with age
Body Composition

- Progressive increase in fat and decrease in fat-free mass
- Loss of up to 3 kg lean body mass per decade after age 50
Increased Body fat

- Multifactorial
- Decreased physical activity is a major cause
- Reduced growth hormone
- Declining sex hormone action
- Reduced BMR and thermic effect of food
Age related Skeletal muscle loss

- Presence of **Sarcopenia** is an independent predictor of poor gait, balance, falls and fractures.
- Probably happens due to reduced exercise and anabolic hormone action.
Age related changes in appetite
Healthy individuals have recorded intakes up to 44% greater when eating with other people than eating alone.

Higher food intakes are reported to occur when women eat with men rather than other women, and when both men and women dine with family or friends rather than with coworkers.

A simple and inexpensive way to increase caloric intake in homebound older adults is to make arrangements for family members or caregivers to eat with them.


Diminished sense of smell and taste

- Sense of taste probably declines with aging
- Stronger evidence that sense of smell declines after age 50 years
- Strong correlation between impaired sense of smell and reduced interest and intake of food

Reduced sensory-specific satiety

- Normal decline in pleasantness of the taste of a food after it has been consumed
- Leads to less varied diet and the development of micronutrient deficiencies

Peripheral factors
Sensory signals induced by distension by food contribute to initial sensations of fullness during a meal

Extent of antral filling and distension relates more closely to feelings of fullness and satiety than proximal gastric distension
The aging gut

- Aging probably is related to **impaired receptive relaxation** of the gastric fundus.
- **Increased Nitric Oxide** with aging may contribute to the slower gastric emptying observed in the elderly.
Cholecystokinin

Exogenous CCK administration decreases food intake and administration of CCK antagonists increases food intake in animals and humans.
Ghrelin

- Ghrelin a peptide hormone produced in the gastric fundus increases food intake and releases growth hormone
Central Factors
Age related impairment in homeostasis

- “following overfeeding, younger men exhibited spontaneous hypophagia, whereas the older men did not (mean [+/- SD] changes in energy intake relative to control values were -2.11 [+/- 2.18] and 1.55 [+/- 2.11] MJ/d, respectively; P = .006). As a result, the younger men lost the excess body weight gained during overfeeding but the older men did not. Similarly, following underfeeding, the younger men exhibited hyperphagia while the older men did not (mean [+/- SD] changes in energy intake relative to control values were 1.88 [+/- 2.31] and -0.52 [+/- 1.54] MJ/d, respectively; P = .02), and as a result the older men failed to regain the weight lost during underfeeding.”

Cytokines

- Age associated increases in the production or effect of satiating cytokines may contribute to the anorexia of aging.
- Age itself maybe a form of stress

# Disease related cachexia and associated cytokines

<table>
<thead>
<tr>
<th>Condition</th>
<th>Associated Cytokines</th>
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<tbody>
<tr>
<td>Pulmonary cachexia</td>
<td>TNF</td>
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<tr>
<td>Cardiac cachexia</td>
<td>TNF/proinflammatory</td>
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<tr>
<td>ESRD Cachexia</td>
<td>Alpha2 macroglobulin &amp; CRP</td>
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<tr>
<td>Cancer cachexia</td>
<td>Fibrinogen and TNFs</td>
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<tr>
<td>HIV cachexia</td>
<td>Reduced Body Cell Mass</td>
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<tr>
<td>Rheumatological Cachexia</td>
<td>TNF &amp; Interleukin-1</td>
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</tbody>
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20 WEIGHT LOSS IN THE ELDERLY
Causes and effect of Undernutrition in Older people
“Meals On Wheels”

- Medication effects
- Emotional problems
- Anorexia nervosa, alcoholism
- Late life Paranoia
- Swallowing disorders
- Oral factors
- No money, Nosocomial infections
- Wandering and other dementia related behaviors
- Hyperthyroidism, hypothyroidism, HPTH, Hypoadrenalism
- Enteric problems
- Eating problems
- Low salt, low cholesterol diet
- Stones, Social problems (isolation, inability to obtain preferred foods)
Effects of Protein Energy Under nutrition

- Immune dysfunction
- Infections
- Cognitive abnormalities
- Anemia
- Muscle weakness
- Fatigue
- Edema
- Pressure ulcers
- Hip fractures
- Mortality
Consequences of weight loss

- Nursing home residents had a **significantly higher mortality rate in the 6 months after loosing 10% of their body weight irrespective of diagnosis or cause of death**. (Murden et al, JGIM 1994)

- Institutionalized elderly who lose **5% of their body weight in 1 month** were **4 times more likely to die within one year**. (Ryan et al, SMJ 1995)

- In **Alzheimer's patient weight loss correlates with disease progression**, and a weight loss of at least 5% is a significant predictor of death. (White et al, JAGS 1998)
Consequences of weight loss

- Cardiovascular Health Study- 4714 homebound elderly without known cancer-, 17% lost 5% or more wt.- **2.09 fold increased mortality in this group.**

- Systolic HTN in Elderly Program Study- subjects with wt loss of 1.6 kg/yr or more had 4.9 times greater death rate.
QUESTIONS