Anorexia & Weight Loss in Older People

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Geriatric Giants
- atypical presentation

- Instability (Fall)
- Immobility
- Intellectual impairment
- Incontinence
- Inanition Anorexia
- Insomnia
- Iatrogenesis
Geriatric Syndrome

1. Decline in physiologic function & reserve

2. Disease

**Symptoms**
- weakness
- fatigue
- anorexia
- undernutrition
- weight loss

**Signs**
- physiologic changes
- balance & gait
- deconditioning
- falls
- injury
- acute illness
- hospitalization
- disability
- dependency
- death
Neurologic Changes in Aging & Under-nutrition

**Physiologic changes**

- ↓ dendritic connections
- ↓ dopamine activity
- ↑ neurofibrillary tangle
- ↓ acetylcholine activity
- ↓ serotonin activity
- ↓ smell ~ 50%
- ↓ gustatory sense

**Clinical correlation**

- impaired memory retrieve
- ↑Parkinsonism
- pathologic change of Alzheimer disease
- ↑amnesia
- ↑depression
- ↓ appetite
- spicy, salty food
### Aging and Nutritional Changes:

**Decreased total energy requirement**

<table>
<thead>
<tr>
<th>Why changes</th>
<th>Aggravating factors in ageing</th>
<th>Consequences</th>
<th>Common co-morbid diseases</th>
</tr>
</thead>
</table>
| - ↓ energy expenditure: ↓ resting metabolic rate 1-2%/decade between age 20 – 70.* | - Acute & chronic illnesses  
- Polypharmacy  
- Anorexia (vision, taste, olfactory)  
- Oral health & dysphagia  
- Constipation | - Nutrient needs may ↔ or ↑ then, may lead to nutrient deficiency | - Frailty |
| - Loss lean body mass              |                                                    |                                                   |                           |
| - ↓ physical activity              |                                                    |                                                   |                           |

*Bernstein M. J Acad Nutr Diet 2012;112(8): 1255-77.*
Anorexia & under-nutrition in older people

- Why under-nutrition is commonly unrecognized in daily clinical practice?
- Why anorexia & under-nutrition is so important among older patients?
- How to recognize under-nutrition in older patients?
- How to prevent under-nutrition in various settings?
Why under-nutrition is commonly unrecognized in daily clinical practice?

R-A-M-P-S

- R – reduced body reserve: muscle wasting
Why under-nutrition is commonly unrecognized in daily clinical practice?

R-A-M-P-S

- R – reduced body reserve: muscle wasting
- A – atypical presentation: under-nutrition is the important underlying mechanism of many geriatric syndromes
- M – multiple pathology: disease ↔ nutrition
- P – polypharmacy: adverse drug reaction
- S – social adversity: influence of social impact

Why under-nutrition is so important among older patients?

1. Common
2. Underlying causes of many common diseases among older people
3. Silent killer hidden in the dark
4. Easy to correct, if do it in time
Why under-nutrition is so important among older patients? _common

- Protein calorie malnutrition
  - Developed country:
    - community 15%, hospital 23-62%, nursing home 85%
  - Thailand: community

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Men (%)</th>
<th>Women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 – 69 years old</td>
<td>13 – 27</td>
<td>5 – 24</td>
</tr>
<tr>
<td>70 – 79 years old</td>
<td>16 – 39</td>
<td>11 – 39</td>
</tr>
<tr>
<td>≥ 80 years old</td>
<td>20 – 39</td>
<td>18 – 54</td>
</tr>
</tbody>
</table>

ประเสริฐ อัสสันตชัย, การอบรมด้านผู้สูงอายุและความชรา พ.ศ. 2544. กรุงเทพฯ : โรงพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย 2544 : 58-83
Why under-nutrition is so important among older patients?

Vitamin deficiency surveyed in 2,336 cases from 4 regions of Thailand

- Betacarotene deficiency 83 %
- Vitamin E deficiency 55.5 % (vs. 2.5%)
- Folate deficiency 38.8 % (vs. 3.3%)
- Vitamin B1 deficiency 30.1 % (vs. 3-15%)
- Vitamin C deficiency 9.9 % (vs. 25%)
- Vitamin A deficiency 6.1 % (vs. 0.3%)
- Vitamin B12 deficiency 0.6 % (vs. 20%)

Why under-nutrition is so important among older patients?

Underlying causes:

- **Fall**
  - low lean body mass (OR 0.96, 95% CI: 0.92 - 0.98)
  - low serum albumin (OR 1.86, 95% CI: 1.17 - 2.96)


- **Osteoporosis**
  - community: low fat mass (OR 0.91, 95% CI: 0.88-0.94 in women)
    (OR 0.94, 95% CI: 0.89-0.98 in men)
  - nursing home:
    low lean body mass (regression coefficient 0.003, p 0.03)

Why under-nutrition is so important among older patients? Underlying causes

- Hospitalization
  - Survey in 66 elderly clubs: low BMI
    OR 1.52, 95% CI: 1.09 - 2.13

- Quality of life
  - Survey in 66 elderly clubs: lack of regular milk intake
    OR 1.40, 95% CI: 1.06 - 1.85
Why under-nutrition is so important among older patients? Underlying causes

Complications of protein calorie malnutrition

- Muscle weakness
- Immunodeficiency: ↓CD4/CD8, infection in elderly
- Anemia
- Poor cognitive function
- Delayed wound healing
- Adverse drug reaction: pharmacokinetics
Why under-nutrition is so important among older patients?

- **Overall mortality**
  
  BMI < 22 : RRR = 1.3 in women aged 55 – 64  
  RRR = 1.6 in women aged 65 – 74  
  

- **Bacterial infection**
  
  anorexia requiring NG tube feeding in pt. with UTI predicted mortality  
  
How to recognize under-nutrition in older patients?

- **Community setting**
  - Annual check-up
    - Comprehensive geriatric assessment
    - Validated tools e.g. MNA, NSI, SCALES, etc.

- **Clinical setting**
  - Holistic geriatric assessment
  - Clinical examination
  - Laboratory tests
## Summary of screening issues for under-nutrition

<table>
<thead>
<tr>
<th>Physical</th>
<th>Mental</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug-induced anorexia</td>
<td>Chronic alcoholism</td>
<td>Poverty</td>
</tr>
<tr>
<td>Oral health</td>
<td>Delirium</td>
<td>Low education, nutritional awareness</td>
</tr>
<tr>
<td>Chronic disease esp. chronic diarrhea</td>
<td>Depression</td>
<td>Live alone</td>
</tr>
<tr>
<td>Malignancy</td>
<td>Dementia</td>
<td>Poor social input</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
<td></td>
<td>Poor ADL: cooking, shopping</td>
</tr>
</tbody>
</table>
How to recognize under-nutrition in older patients? Community setting

- Holistic geriatric assessment
  - Physical: chronic illness, gait, geriatric syndrome, visual acuity, hearing, dental, dietary recall.
  - Mental: dementia, depression
  - Social: social isolation, poverty
  - Function: poor self-care
How to recognize under-nutrition in older patients? :

Mini-Nutritional Assessment (MNA)®

- Validated in various settings: community, nursing home, hospital
  - sensitivity 96%, specificity 98%!
  - 4 parts: anthropometry, dietary recall, clinical, self-assessment.

Interactive versions of the MNA®-Short Form: 27 languages
Bengali, Chinese, Czech, Dutch, English, Farsi, Finnish, French, German, Greek, Hindi, Indonesian, Italian, Japanese, Korean,

Lithuanian, Norwegian, Portuguese, Polish, Romanian, Sinhala, Slovakian, Spanish, Swedish, Turkish, Thai and Urdu.
## Mini-Nutritional Assessment (MNA)®

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
</table>
| 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 |
| 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 |
| Mobility                                                                 | 0 = bed or chair bound  
1 = able to get out of bed / chair but does not go out  
2 = goes out |
| Has suffered psychological stress or acute disease in the past 3 months? | 0 = yes  
2 = no |
| Neuropsychological problems                                              | 0 = severe dementia or depression  
1 = mild dementia  
2 = no psychological problems |
| Body Mass Index (BMI) (weight in kg) / (height in m)²                    | 0 = BMI less than 19  
1 = BMI 19 to less than 21  
2 = BMI 21 to less than 23  
3 = BMI 23 or greater |

**Scores:**
- **≤ 11**: at risk
- **≤ 7**: malnourished
How to recognize under-nutrition in older patients? **Community setting**

- **SCALES**: no diagnosis is needed, >3 points
  - **C** – cholesterol: total chol. <180 = 1 pt., <160 = 2 pts.
  - **A** – albumin: albumin <4 = 1 pt., <3.5 = 2 pts.
  - **L** – loss of weight: loss < 2 lbs. (1m.) = 1 pt., loss > 6 lbs. (6m.) = 2 pts.
  - **E** – eating: cognitive impairment (1 pt.), physical limitation (1 pt.)
  - **S** – shopping: inability to shop or cook = 1 pt.
How to recognize under-nutrition in older patients? __community setting

- **DETERMINE**: self-rated
  - **D** – disease
  - **E** – eating poorly
  - **T** – toothless/mouth pain
  - **E** – economic hardship
  - **R** – reduced social contact
  - **M** – multiple medicine
  - **I** – involuntary weight loss
  - **N** – need assistance
  - **E** – elder years above age 80
How to recognize under-nutrition in older patients? __clinical setting

MEALS ON WHEELS

- **M**: medications
- **E**: emotional (depression)
- **A**: alcoholism, anorexia, abuse of the elders
- **L**: late-life paranoia
- **S**: swallowing problems (dysphagia)
- **O**: oral problems
- **N**: no money (poverty)

- **W**: wandering and other dementia-related problems
- **H**: hyperthyroidism, pheochromocytoma
- **E**: enteric problems (malabsorption)
- **E**: eating problems
- **L**: low salt, low cholesterol diet
- **S**: shopping and meal preparation problems

3 common causes: malignancy, depression, GI problems
## The Beers Criteria

: do more than guide decisions about what drugs to use in older patients.
: also tell us what not to do


### Table 7. Drugs With Strong Anticholinergic Properties

<table>
<thead>
<tr>
<th>Category</th>
<th>Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiarrhythmics</td>
<td>Promethazine</td>
</tr>
<tr>
<td>Disopyramide</td>
<td>Pyrilamine</td>
</tr>
<tr>
<td>Amitriptyline</td>
<td>Triprolidine</td>
</tr>
<tr>
<td>Amoxapine</td>
<td></td>
</tr>
<tr>
<td>Clomipramine</td>
<td>Antimuscarinics</td>
</tr>
<tr>
<td>Desipramine</td>
<td>(urinary incontinence)</td>
</tr>
<tr>
<td>Doxepin (&gt;6 mg)</td>
<td>Darifenacin</td>
</tr>
<tr>
<td>Imipramine</td>
<td>Fesoterodine</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>Flavoxate</td>
</tr>
<tr>
<td>Paroxetine</td>
<td>Oxybutynin</td>
</tr>
<tr>
<td>Protriptyline</td>
<td>Solifenacin</td>
</tr>
<tr>
<td>Trimipramine</td>
<td>Tolterodine</td>
</tr>
<tr>
<td>Tropium</td>
<td></td>
</tr>
<tr>
<td>Antiemetics</td>
<td></td>
</tr>
<tr>
<td>Prochlorperazine</td>
<td>Antiparkinsonian agents</td>
</tr>
<tr>
<td>Promethazine</td>
<td>Benzoptine</td>
</tr>
<tr>
<td>Trihexyphenidyl</td>
<td></td>
</tr>
<tr>
<td>Antihistamines (first generation)</td>
<td></td>
</tr>
<tr>
<td>Brompheniramine</td>
<td>Antipsychotics</td>
</tr>
<tr>
<td>Carbinoxamine</td>
<td>Chlorpromazine</td>
</tr>
<tr>
<td>Chlorpheniramine</td>
<td>Clozapine</td>
</tr>
<tr>
<td>Clemastine</td>
<td>Loxapine</td>
</tr>
<tr>
<td>Cyproheptadine</td>
<td>Olanzapine</td>
</tr>
<tr>
<td>Dexamfetamine</td>
<td>Perphenazine</td>
</tr>
<tr>
<td>Dextroamphetamine</td>
<td>Thioridazine</td>
</tr>
<tr>
<td>Dimenhydrinate</td>
<td>Trifluoperazine</td>
</tr>
<tr>
<td>Diphenhydramine (oral)</td>
<td></td>
</tr>
<tr>
<td>Doxylamine</td>
<td>Antispasmodics</td>
</tr>
<tr>
<td>Hydroxyzine</td>
<td>Atropine (excludes ophthalmic)</td>
</tr>
<tr>
<td>Meclizine</td>
<td>Belladonna alkaloids</td>
</tr>
<tr>
<td>Clidinium-chlordiazepoxide</td>
<td>Scopolamine (excludes ophthalmic)</td>
</tr>
<tr>
<td>Dicyclomine</td>
<td>Skeletal muscle relaxants</td>
</tr>
<tr>
<td>Homatropine (excludes ophthalmic)</td>
<td></td>
</tr>
<tr>
<td>Hyoscyamine</td>
<td>Cyclobenzaprine</td>
</tr>
<tr>
<td>Methscopolamine</td>
<td>Orphenadrine</td>
</tr>
<tr>
<td>Propantheline</td>
<td></td>
</tr>
</tbody>
</table>
How to recognize under-nutrition in older patients? __clinical setting

- **History taking**
  - weight loss > 5% in 6 months without intention
  - vegetarian for many years → cyanocobalamin def.
  - chronic alcohol drinking → thiamin def., folate def.

- **Clinical examination**
  - protein def. → edema, muscle weakness & wasting, white nail
  - calorie def. → weight loss, muscle weakness
  - vitamin A def. → xerophthalmia, xerosis, corneal ulcer
  - vitamin B1 def. → high-output heart failure, ophthalmoplegia, neuropsychiatric symptoms
  - etc.
How to recognize under-nutrition in older patients? __clinical setting

- Investigations: Anthropometry
  - Body mass index < 18.5? (decreased height during increasing age, inconvenient to measure esp. admitted case)
  - Mindex (woman) = body weight / demispan (m.)
  - Demiquet (man) = body weight / (demispan)²
  - Mid-upper-arm circumference
  - Skinfold thickness: triceps, biceps, subscapular, suprailiac
Alternative anthropometric measurement for older Thai people

- Demispan measurement

- cut-off point of Mindex for Thai woman
  55.95 kg./m.

- cut-off point of Demiquet for Thai man
  75.6 kg./m.²

Alternative Anthropometric Indices to Identify the Neglected Under-nutrition in Older Adults.

Table 1. Comparisons of various nutritional variables between those who had normal nutritional status and those who had under-nutrition classified by Mindex and Demiquet.

<table>
<thead>
<tr>
<th></th>
<th>Older women</th>
<th>p</th>
<th>Older men</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal nutrition (n=2425)</td>
<td></td>
<td>Normal nutrition (n=793)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Under-nutrition (n=69)</td>
<td></td>
<td>Under-nutrition (n=42)</td>
<td></td>
</tr>
<tr>
<td>Lean body mass</td>
<td>41.7 ± 5.9</td>
<td>&lt; 0.001</td>
<td>53.8 ± 7.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Body fat mass</td>
<td>17.9 ± 6.1</td>
<td>&lt; 0.001</td>
<td>11.9 ± 4.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Calcaneal bone mineral density</td>
<td>0.40 ± 0.09</td>
<td>&lt; 0.001</td>
<td>0.52 ± 0.11</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>12.5 ± 1.2</td>
<td>&lt; 0.001</td>
<td>14.0 ± 1.4</td>
<td>0.001</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>216.9 ± 40.8</td>
<td>0.033</td>
<td>203.2 ± 40.7</td>
<td>0.119</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>147.4 ± 85.5</td>
<td>&lt; 0.001</td>
<td>156.5 ± 114.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Low density lipoprotein</td>
<td>129.9 ± 37.6</td>
<td>0.005</td>
<td>121.6 ± 36.2</td>
<td>0.001</td>
</tr>
<tr>
<td>Albumin</td>
<td>4.40 ± 0.25</td>
<td>0.067</td>
<td>4.47 ± 0.26</td>
<td>0.014</td>
</tr>
</tbody>
</table>

How to recognize under-nutrition in older patients? __clinical setting

Investigations: biochemical tests

- **Protein calorie malnutrition**: hemoglobin, albumin, transferrin, total cholesterol (<156 mg%), retinol-binding globulin, IGF-1, fibronectin, etc.

<table>
<thead>
<tr>
<th></th>
<th>Serum albumin</th>
<th>Serum transferrin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>3.5 – 4.5</td>
<td>0.25 – 0.3</td>
</tr>
<tr>
<td>Mild</td>
<td>3.0 – 3.5</td>
<td>0.15 – 0.25</td>
</tr>
<tr>
<td>Moderate</td>
<td>2.5 – 3.0</td>
<td>0.10 – 0.15</td>
</tr>
<tr>
<td>Severe</td>
<td>&lt; 2.5</td>
<td>&lt; 0.10</td>
</tr>
</tbody>
</table>
How to prevent under-nutrition in various settings? 

- **Primary prevention**
  - **Energy requirement by body weight**
    - low stress: 20 kcal./kg./day
    - moderate stress: 25 - 30 kcal./kg./day
    - severe stress: 35 kcal./kg./day
  - **Harris-Benedict equation**
    - men: $66.5 + (13.7 \times BW) + (5 \times \text{ht. in cm}) - (6.8 \times \text{age})$
    - women: $655 + (9.5 \times BW) + (1.8 \times \text{ht. in cm}) - (4.7 \times \text{age})$
How to prevent under-nutrition in various settings? 

- **Tertiary prevention**

  - Nutritional supplement
    - General: Blendera®, Ensure®, Isocal®, Nutren®, Panenteral®, Prosobee®
    - Specific: Neomune®, Peptamen®, Glucerna®, Nepro®
  
  - Orexiginic drug
    - Megestrol acetate
    - Dronabinol
    - Anabolic agent
    - Antidepressant
    - Cyproheptadine ??
  
  - Social input: home visit for those living alone, meals-on-wheel, health volunteer, national health policy, etc.
Anorexia in older people: take home message

- Anorexia & under-nutrition is commonly unrecognized in daily clinical practice. R-A-M-P-S
- Under-nutrition is very important among older patients
  - Common
  - Underlying causes of many common diseases among older people
  - Silent killer hidden in the dark
  - Easy to correct if do it in time
- Common causes of anorexia: 3 domains (physical, mental, social aspects) e.g. MEALS-ON-WHEEL
- Screening tools to detect anorexia & under-nutrition
  - Serial BW, Mindex, Demiquet
Thank You for Your Attention