Nutritional problems

Age-related diseases
Functional impairments
Drug-induced nutritional deficiencies
Malnutrition

> **Deficiencies**
  - Protein–energy
  - Vitamins
  - Fibre
  - Water

> **Excesses**
  - Obesity
  - Hypervitaminosis
Undernutrition

Categories
  - Community dwelling
  - Hospitalized
  - Institutionalized (nursing home)

*Burden of acute and chronic disease differs*  
Oncology

Nutritional requirements vary
Aging = Loss

Muscle mass
Muscle strength
Bone mass
Hormone production

Co-occurrence suggests
> common risk factors
> overlap in pathophysiology
Weight loss is common

**Poor outcome**

**BMI < 22**
- higher 1-yr mortality
- poorer functional status

**BMI < 20.5 in men > 75 y**
- 20% higher mortality

**BMI < 18.5 in women > 75 y**
- 40% higher mortality.

*Key factor is recent weight loss*

Age distribution in BMI class

Age distribution according to BMI

<table>
<thead>
<tr>
<th>BMI</th>
<th>&lt;17</th>
<th>17-18.4</th>
<th>18.5-24.4</th>
<th>25-29.9</th>
<th>30-39.9</th>
<th>40+</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Age Category</td>
<td>85+</td>
<td>80-84</td>
<td>75-79</td>
<td>70-74</td>
<td>65-69</td>
<td>60+</td>
</tr>
</tbody>
</table>

Vandewoude et al, Cachexia Conf 2007
Age-related loss of muscle mass

is clinically important

> diminished strength and exercise capacity
> decline in function

65% of older men and women cannot lift 10 pounds using their arms
Age-related loss of muscle mass

A

Muscle thickness biceps (cm)

0.00
0.10
0.20
0.30
0.40

0
10
20
30
40
50
60
70
80
90

Age (yr)

B

Muscle thickness quadriceps (cm)

0.00
0.10
0.20
0.30
0.40
0.50
0.60

0
10
20
30
40
50
60
70
80
90

Age (yr)

- male
- female
- male
- female

"I’ll be back!"

"Oh, my back!"
Causes of skeletal muscle loss

Voluntary
Involuntary
Causes of skeletal muscle loss

**Starvation**
- pure protein-energy deficiency
- reversed by replenishment of nutrients

**Cachexia**
- severe wasting
- accompanying disease states

**Sarcopenia**
- age-related decline in muscle mass
Starvation
Pure protein deficiency
Conserve lean body mass
Deplete fat mass

Sarcopenia
Deplete lean body mass
Weight may not change
Mediated by testosterone, growth hormone, IGF-1, immobility

Cachexia
Cytokine-mediated
Inflammatory disease
In the Geriatric Oncology patient

- Ageing
- Nutritional intake
- Cancer
In the Geriatric Oncology patient

- Sarcopenia
- Starvation
- Cachexia
Nutritional Assessment

- to identify patients at risk
- to identify patients who could benefit from an intervention
- prognosis
- to evaluate the intervention

Screening should *increase alertness*
Assessment

Risk
- General
  - SNAQ: Short Nutritional Assessment
  - NRS: Nutritional Risk Score
- Geriatrics
  - NSI: Nutrition Screening Initiative
  - MUST: Malnutrition Universal Screening Tool
  - MNA: Mini Nutritional Assessment

Actual nutritional status

Pathology
- Swallowing disorders
**SNAQ**

**Did you lose weight unintentionally?**
- $>6$ kg in the past 6 months  
  - 3
- $>3$ kg in the past months  
  - 2

**Did you experience a decreased appetite over the past month?**  
- 1

**Did you use supplemental drinks or tube feeding over the past month?**  
- 1

well-nourished  
- 1
moderately malnourished  
- 2
severely malnourished  
- 3

**NRS**

<table>
<thead>
<tr>
<th>Impaired nutritional status</th>
<th>Severity of disease (≈ stress metabolism)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Normal nutritional status</td>
</tr>
<tr>
<td>Score 0</td>
<td>Wt loss &gt;5% in 3 months  Or</td>
</tr>
<tr>
<td>Mild</td>
<td>Food intake below 50–75% of normal requirement in preceding week</td>
</tr>
</tbody>
</table>
| Moderate | Wt loss >5% in 2 months  Or | Moderate | Score 2 | Head injury (18, 19)  Bone marrow transplantation (20)  Intensive care patients (APACHE I)
| Score 2 | BMI 18.5 – 20.5 + impaired general condition  Or | | Food intake 25–50% of normal requirement in preceding week |
| Severe | Wt loss >5% in 1 month (≈ >15% in 3 months (17))  Or | Severe | | Score 3 |
| Score 3 | BMI <18.5 + impaired general condition (17)  Or | | Food intake 0–25% of normal requirement in preceding week in preceding week |

Score:

Total score:

1. Find score (0–3) for Impaired nutritional status (only one: choose the variable with highest score) and Severity of disease (≈ stress metabolism, i.e. increase in nutritional requirements).
2. Add the two scores ( = total score).
3. If age ≥ 70 years: add 1 to the total score to correct for frability of elderly
4. If age corrected total ≥ 3: start nutritional support

<table>
<thead>
<tr>
<th>Description</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have an illness or condition that made me change the kind and/or amount of food I eat.</td>
<td>2</td>
</tr>
<tr>
<td>I eat fewer than 2 meals per day.</td>
<td>3</td>
</tr>
<tr>
<td>I eat few fruits or vegetables, or milk products.</td>
<td>2</td>
</tr>
<tr>
<td>I have 3 or more drinks of beer, liquor or wine almost every day.</td>
<td>2</td>
</tr>
<tr>
<td>I have tooth or mouth problems that make it hard for me to eat.</td>
<td>2</td>
</tr>
<tr>
<td>I don't always have enough money to buy the food I need.</td>
<td>4</td>
</tr>
<tr>
<td>I eat alone most of the time.</td>
<td>1</td>
</tr>
<tr>
<td>I take 3 or more different prescribed or over-the-counter drugs a day</td>
<td>1</td>
</tr>
<tr>
<td>Without wanting to, I have lost or gained 10 pounds in the last 6 months.</td>
<td>2</td>
</tr>
<tr>
<td>I am not always physically able to shop, cook, and/or feed myself.</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Total The Nutritional Score. If It's**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>Good! Recheck nutritional score in 6 months</td>
</tr>
<tr>
<td>3-5</td>
<td>You are at moderate nutritional risk. Recheck nutritional score in 3 months.</td>
</tr>
<tr>
<td>6 or more</td>
<td>You are at high nutritional risk. Talk with your physician or dietitian.</td>
</tr>
</tbody>
</table>
**Step 1**
BMI score

<table>
<thead>
<tr>
<th>BMI kg/m²</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;20 (&gt;30 Obese)</td>
<td>0</td>
</tr>
<tr>
<td>18.5 - 20</td>
<td>1</td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>2</td>
</tr>
</tbody>
</table>

**Step 2**
Weight loss score

Unplanned weight loss in past 3-6 months

<table>
<thead>
<tr>
<th>%</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>0</td>
</tr>
<tr>
<td>5-10</td>
<td>1</td>
</tr>
<tr>
<td>&gt;10</td>
<td>2</td>
</tr>
</tbody>
</table>

**Step 3**
Acute disease effect score

If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days

Score 2

**Step 4**
Overall risk of malnutrition

Add Scores together to calculate overall risk of malnutrition

Score 0 Low Risk  Score 1 Medium Risk  Score 2 or more High Risk

*BAPEN, 2008*
MNA

- Antropometric measurements
- Global evaluation
- Diet
- Subjective assessment
MNA

Screening

> 6 items
> If positive (11 points or below): go to Assessment
<table>
<thead>
<tr>
<th>Score</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 24</td>
<td>None</td>
</tr>
<tr>
<td>17 ≤ score &lt; 24</td>
<td>At risk of malnutrition</td>
</tr>
<tr>
<td>&lt; 17</td>
<td>Malnourished</td>
</tr>
</tbody>
</table>
Problems in Geriatric patients

Validation of instruments not in older people (SNAQ) age as riskfactor (NRS)
Problems in Geriatric patients

Validation of instruments

Anthropometry

- Bedridden patients
- Mobility problems
- Body length is not constant
<table>
<thead>
<tr>
<th>BMI?</th>
<th>Age</th>
<th>Weight</th>
<th>Length</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>75</td>
<td>56</td>
<td>132</td>
<td>32.1</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>56</td>
<td>157</td>
<td>22.7</td>
</tr>
</tbody>
</table>

BMI is doubtful parameter in older people.
Problems in Geriatric patients

Validation of instruments

Anthropometry

Social and psychic factors
  > Subjective impression
  > Dementia - depression
Conclusion

- Nutritional assessment should be part of routine evaluation of the geriatric oncology patient
- Nutritional assessment should be framed in a larger CGA (comprehensive geriatric assessment) addressing several functional domains
Conclusion

• Difference should be made between assessment of risk and actual nutritional status

• Body weight assessment with specific attention to unintended weight loss is essential

• BMI should be interpreted with caution (overestimation due to shorter body length)
Conclusion

Increased alertness

Subjective global assessment

Willingness for early intervention