Mini Nutrition Assessment (MNA®): Nutrition Screening for the Elderly

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Vevey, Switzerland
How can we most effectively identify elderly who are at risk of malnutrition?
Why Screen?

- 40% of patients entering the hospital are malnourished or at risk of malnutrition
- <40% of patients eat all the food they are served in the hospital
- Patients are discharged from hospital with malnutrition
Nutrition Screening

- **Purpose**: to quickly identify individuals nutritionally at-risk or who are malnourished
- Tests should be non-invasive, inexpensive, and have rapidly available results
Criteria for Nutrition Screening

➢ It should be validated!
  • Has it been shown to screen for the desired outcome?
    • Sensitivity, Specificity, Positive predictive value, Negative predictive value, inter-rater reliability

➢ It should be valid for the target patient population, target condition, target care setting

Does your screening tool meet the criteria?
Guidelines

- **ASPEN**
  - All patients screened within 24 hrs of admission; those at risk undergo nutrition assessment

- **ESPEN**
  - Healthcare organizations should have a policy & a specific set of protocols for identifying patients at nutritional risk.
    
    *The following process is suggested:*
    
    - Screening
    - Assessment
    - Monitoring & Outcome
    - Communication
    - Audit
  
  - All pts should be screened upon admission & linked to defined course of action
Validated Nutrition Screening Tools

- MUST – Malnutrition Universal Screening Tool
- NRS 2002 – Nutrition Risk Screen
- MNA® - Mini Nutritional Assessment
- SNAQ – Short Nutritional Assessment Questionnaire
- MST – Malnutrition Screening Tool
- SGA – Subjective Global Assessment
Screening Tools
Recommended by ESPEN

- The community: MUST for adults
- The hospital: NRS – 2002
- The elderly: MNA®
- Children: Not yet available

MUST
Malnutrition Universal Screening Tool

- Developed in the UK by BAPEN Malnutrition Advisory Group (MAG)
- Designed to identify adults who are underweight and at risk of malnutrition, and the obese
- An easy, rapid, practical, reliable, validated tool
- Evaluated in the hospital, out patient, general practice, community, and long term care.
- Is linked to a care plan

www.bapen.org.uk
Step 1: BMI score

- BMI $\text{kg/m}^2$ Score
  - $>20$ (Moderate) = 0
  - 18.5-20 = 1
  - $<18.5$ = 2

Step 2: Weight loss score

- Unplanned weight loss in past 3-6 months % Score
  - $<5$ = 0
  - 5-10 = 1
  - $>10$ = 2

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

Step 5: Management guidelines

0. Low Risk
- Routine clinical care
  - Repeat screening
    - Hospital — weekly
    - Care Home — monthly
    - Community — annually
  - For special groups e.g. those $>75$ yrs

1. Medium Risk
- Observe
  - Document dietary intake for 3 days if subject in hospital or care home
  - If improved or adequate intake — little clinical concern: if no improvement — clinical assessment — follow local policy
  - Repeat screening
    - Hospital — weekly
    - Care Home — at least monthly
    - Community — at least every 3-6 months

2 or more
- High Risk
- Treat
  - Refer to dietitian, Nutritional Support Team or implement local policy
  - Improve and increase overall nutritional intake
  - Monitor and review care plan
    - Hospital — weekly
    - Care Home — monthly
    - Community — monthly
  - Unless detrimental or no benefit is expected from nutritional support e.g. imminent death

All risk categories:
- Treat underlying condition and provide help and advice on food choices, eating and drinking when necessary.
- Record malnutrition risk category.
- Record need for special diets and follow local policy.

Obesity:
- Record presence of obesity. For those with underlying conditions, these are generally controlled before the treatment of obesity.

Remarks: Subjects identified at risk as they move through care settings.
See the 'MUST' Exemplaric Booklet for further details and the 'MUST' Report for supporting evidence.
MUST Criteria

- **BMI**
  - BMI > 20 = 0 points
  - BMI 18.5 – 20 = 1 point
  - BMI <18.5 = 2 points

- **Wt loss in 3 – 6 months**
  - < 5% = 0 points
  - 5 – 10 % = 1 point
  - > 10% = 2 points

- **Acute disease effect**
  - 2 points for little nutritional intake for >5 days (past / future)

- **Summary Score:**
  - 0 = low risk
  - 1 = moderate risk
  - 2 = high risk
Recommended Management Guidelines

0 = Low risk: Routine care
   If obese / special diet – local policy
   Hospital: repeat screen every week
   Care homes: repeat screen every month
   Community: repeat screen annually for special groups e.g. >75yr

1 = Medium risk: Observe
   Help with food choices / dietary advice
   Hospital: Document dietary/fluid intake x 3d, repeat screen weekly
   LTC: Document dietary/fluid intake x 3d, repeat screen monthly
   Community: Repeat screen (2-3 monthly)

2 = High risk: Treat
   Refer to Dietitian, NST or implement local policy
   Improve nutritional intake
   Monitor and review care plan
MUST criticism in elderly

- No items to assess functionality
- Too unspecific for the elderly
- Focus on acute illness makes it inappropriate for long-term care
- BMI cut off is too high
NRS 2002 - Nutrition Risk Screening

- Developed in 2003 (Kondrup et al - ESPEN)

- Screen includes measures of current potential undernutrition & disease severity
  
  **Assumption**: Indications for nutrition support are:
  - the severity of undernutrition
  - the increase in nutritional requirements from the disease

- Validated vs RCT of NS to determine if it was able to distinguish those with a positive clinical outcome vs those with no benefit.

- Recommended by ESPEN screening guidelines for hospitalized pts

- Identifies who might benefit from nutritional support
  - Looking for positive clinical outcome
<table>
<thead>
<tr>
<th>Impaired nutritional status</th>
<th>Severity of disease (≈ requirement/stress-metabolism)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong></td>
<td><strong>Score 1</strong></td>
</tr>
<tr>
<td>Wt loss &gt;5% in 3 mths</td>
<td>Hip fracture (9). Chronic patients, in particular with acute complications: cirrhosis (11), COPD (12). Chronic hemodialysis, diabetes, malignant oncology.</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>Food intake &lt;50-75% of normal requirement in preceding week</td>
<td></td>
</tr>
<tr>
<td><strong>Score 2</strong></td>
<td><strong>Score 2</strong></td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>BMI 18.5 - 20.5 + impaired general condition</td>
<td></td>
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<tr>
<td>Or</td>
<td></td>
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<tr>
<td>Food intake 25-50% of normal requirement in preceding week</td>
<td></td>
</tr>
<tr>
<td><strong>Score 3</strong></td>
<td><strong>Score 3</strong></td>
</tr>
<tr>
<td>Wt loss &gt;5% in 1 mth (≈ &gt;15% in 3 mths (17))</td>
<td>Head injury (18, 19). Bone marrow transplantation (20). Intensive care patients (APACHE&gt;10).</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>BMI &lt;18.5 + impaired general condition (17)</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Food intake 0-25% of normal requirement in preceding week</td>
<td></td>
</tr>
<tr>
<td>Score:</td>
<td>Score: +</td>
</tr>
<tr>
<td></td>
<td>= TOTAL SCORE:</td>
</tr>
</tbody>
</table>
Scoring

- Score (0-3) for *Impaired nutritional status*
- Score (0-3) for *Severity of disease*
  (seen as indication of stress-metabolism thus an increase in nutritional requirements)
- Add the two scores to get **Total Score**
- If age $\geq 70$ years: add 1 to the total score to correct for frailty of ageing
- If age-corrected total $\geq 3$: Start Nutritional Support

### MNA
- Developed in 1990
- Validated for ages 65+
- Simple, reliable, quick & non-invasive
- Validated across care settings
- Supported by > 400 publications

### MNA-SF
- Based on the original MNA®
- Uses only 6 items
- Quicker tool for clinical use
- Validated in ambulatory elderly pts

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**Rubenstein et al., J Gerontol 2001;56:M366-M372**
The geriatric assessment is:

- a multidimensional, multidisciplinary diagnostic process used to determine medical, functional, and psychosocial problems and capabilities in an elderly patient who may be at risk for functional decline.
<table>
<thead>
<tr>
<th>Screening</th>
<th>1. Has appetite &amp; food intake declined in past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2. Weight loss in past 3 months?</td>
</tr>
<tr>
<td>B</td>
<td>3. Mobility problems</td>
</tr>
<tr>
<td>C</td>
<td>4. Acute illness or major stress in past 3 months?</td>
</tr>
<tr>
<td>D</td>
<td>5. Neuropsychological problems: Dementia or depression</td>
</tr>
<tr>
<td>E</td>
<td>6. Body mass index (BMI) (kg/m²)</td>
</tr>
</tbody>
</table>

**Screening Form (MNA–SF)**

1. Has appetite & food intake declined in past 3 months?
2. Weight loss in past 3 months?
3. Mobility problems
4. Acute illness or major stress in past 3 months?
5. Neuropsychological problems: Dementia or depression
6. Body mass index (BMI) (kg/m²)

For a more in-depth assessment, complete the full MNA® which is available at [www.mna-elderly.com](http://www.mna-elderly.com).

Ref. Rubenstein LZ et al., J Gerontol 2001;56:M366-M372
Survival Curve

Weight Change: Baseline vs. Final Weight

- Gained >5%
- Lost >5%
- Maintained

P = 0.001
Impact of Weight Loss

- Decline in functional status
- Increase in disability
- Predictor of hospital complications
- Increased mortality

Weight loss in an older person is a profound risk factor independent of initial body weight. Involuntary weight loss has an intensified effect on mortality risk, and is usually associated with clinical illness.
BMI and Mortality

- **BMI <22**: associated with:
  - ↑1 yr mortality rate
  - Poorer functional status in community dwelling elderly
  - Men 75+: BMI <20.5 → 20% higher mortality risk
  - Women 75+: BMI <18.5 → 40% higher mortality risk

- **BMI <20**: a risk factor for in-hospital mortality
Cut-off of BMI is key

BMI  < 18.5  NRS 2002
BMI  < 20  MUST
BMI  < 23  MNA

The Elderly are considered at Nutritional Risk with a BMI < 22 kg/m²
Predictive ability of MNA®

- One-year Mortality
- Correlates with functional level
- Good correlation with dietary intake:
  - energy, carbohydrate, fiber, calcium, vitamins D, B6, C, folate, iron
- Good correlation with biological parameters:
  - Albumin, prealbumin, transferrin, cholesterol, retinol, alpha-tocopherol, zinc, hemoglobin, hematocrit
- Predicts risk of malnutrition before changes seen in serum proteins in relatively healthy elderly
- Detects risk of malnutrition early before severe changes in weight
Why was the MNA® not used in Clinical Practice?

- Took too long time to complete
- Height &/or Weight not available
- Nutrition screening of elderly still not embedded in standard clinical practice
- Lack of awareness in clinical settings
MNA® International Initiative

- Provide an overview of MNA® use around the world
- Examine prevalence of malnutrition in the elderly in different settings worldwide
- Test the validity of the original MNA®-SF in a larger international database
- Develop alternative version of the MNA®-SF for use when BMI is not available
- Create a scoring system for the MNA®-SF to classify nutritional status identical to full MNA®
- Make MNA®-SF more user-friendly and facilitate more widespread use in geriatric care

Work coordinated at Nuremberg University
Comprised of international group of experts and scientists in geriatrics
Methods

- Literature search identified studies on nutrition in geriatric medicine that used in the MNA®
- Studies published from 2000 through 2007
- Authors were asked to submit original datasets for pooled analyses
- 27 datasets (6257 study participants) from 24 authors
The 2008 – 2009 MNA® International Initiative

D. Thomas
B. Langkamp-Henken
K. Charlton
M. Kuzuya
A. Tsai
R. Visvanathan
# Best Question Combination – Compared to Full MNA®

<table>
<thead>
<tr>
<th>Rank</th>
<th>Questions on MNA Form</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Correlation with full MNA</th>
<th>Youden-Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B-C-D-E-F-N</td>
<td>0.90</td>
<td>0.81</td>
<td>0.90</td>
<td>0.71</td>
</tr>
<tr>
<td>2</td>
<td>A-B-C-D-E-F (Original MNA-SF)</td>
<td>0.89</td>
<td>0.82</td>
<td>0.90</td>
<td>0.71</td>
</tr>
<tr>
<td>3</td>
<td>A-B-D-E-F-N</td>
<td>0.84</td>
<td>0.88</td>
<td>0.89</td>
<td>0.73</td>
</tr>
</tbody>
</table>

*Bauer, et al. 2009, IANA*
The MNA-Short Form has now been validated as a stand alone tool for screening of malnutrition.

“Calf Circumference” measurement is proposed as an alternative to BMI, when patient’s weight and/or height are not available.

New cut-off points defined, to identify Malnourished vs. At risk vs. Normally-nourished patients after completing Short Form only, leading to quicker nutritional intervention.
Why Substitute BMI with Calf Circumference?

- In some clinical settings, it is difficult to get weight and height measures (bed-bound persons, amputees)
- In some cultures, weight is not a common health measure
- Calf circumference is easy & quick option
MNA®-SF Using Calf Circumference Measurements

<table>
<thead>
<tr>
<th>Rank</th>
<th>Questions on MNA Forms</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Spearman’s correlation with long-form MNA</th>
<th>Youden-Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B-C-D-E-N-R</td>
<td>0.86</td>
<td>0.84</td>
<td>0.86</td>
<td>0.70</td>
</tr>
<tr>
<td>2</td>
<td>A-B-C-D-E-R &quot;CC-MNA-SF&quot;*</td>
<td>0.85</td>
<td>0.84</td>
<td>0.86</td>
<td>0.70</td>
</tr>
<tr>
<td>3</td>
<td>A-B-D-E-N-R</td>
<td>0.80</td>
<td>0.90</td>
<td>0.86</td>
<td>0.70</td>
</tr>
</tbody>
</table>

*Calf Circumference question used instead of BMI

Bauer, et al. 2009, IANA
MNA®–SF with BMI vs. Full MNA®

Correct classifications: 79.9%

No complete misclassifications by two categories

Vertical bars represent short-form cut-points; horizontal bars represent long-form cut-points.

Bauer et al, 2009
MNA®-SF with Calf Circumference vs. Full MNA®

Correct classifications: 72.9%

No complete misclassifications by two categories

Vertical bars represent short-form cut-points; horizontal bars represent long-form cut-points.

Bauer et al, 2009
Cut-off points for the MNA®-SF

- Like the full MNA®, could the MNA®-SF distinguish between patients who were:
  - Malnourished
  - At risk for malnutrition
  - Well nourished
ROC Analysis for Upper Cut-point of MNA®-SF

Upper cut-point optimized for sensitivity

Used full MNA® as reference:
well-nourished vs. at risk/malnourished

Cut-point at eleven points: sensitivity 89.3%, specificity 81.8%, area under the curve 0.94

Bauer et al, 2009
Lower cut-point optimized for specificity

Used full MNA® as reference:
well-nourished/at risk vs. malnourished

Cut-point at eight points: sensitivity 85.2%, specificity 94.3%, area under the curve 0.97

Bauer et al, 2009
Figure 2. Scoring of the new MNA®-SF³

A: “Appetite loss” 0-2 points
B: “Weight loss” 0-3 points
C: “Mobility” 0-2 points
D: “Acute disease” 0-2 points
E: “Depression/Dementia” 0-2 points

BMI available

F: “BMI” 0-3 points

CC available

R: “CC” 0 or 3 points

12-14 points Well nourished
8-11 points At risk
0-7 points Malnourished

BMI, body mass index; CC, calf circumference
# MNA® International Initiative

## Outcomes

<table>
<thead>
<tr>
<th><strong>Drawbacks of old MNA–SF</strong></th>
<th><strong>Outcomes of new MNA–SF</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time consuming</td>
<td>Quick, stand-alone validated tool</td>
</tr>
<tr>
<td>Height and weight not always available</td>
<td>Calf-circumference valid alternative when height/weight unavailable</td>
</tr>
<tr>
<td>Did not identify malnourished without full MNA</td>
<td>3 cut-off points identify malnourished and allows direct movement from screening to intervention</td>
</tr>
</tbody>
</table>
www.mna-elderly.com
Height Measurement

Demispan

Knee Height
### Appendix 1 - Body Mass Index Table

#### Height (feet & inches)

<table>
<thead>
<tr>
<th>Height (feet &amp; inches)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>41.5</td>
<td>105</td>
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<tr>
<td>43</td>
<td>110</td>
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<td>44.5</td>
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<td>46</td>
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<td>47.5</td>
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<td>80.5</td>
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<td>82</td>
<td>240</td>
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<tr>
<td>83.5</td>
<td>245</td>
</tr>
<tr>
<td>85</td>
<td>250</td>
</tr>
</tbody>
</table>

#### Height (cm)

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>Underweight</td>
</tr>
<tr>
<td>165</td>
<td>Weight Appropriate</td>
</tr>
<tr>
<td>170</td>
<td>Overweight</td>
</tr>
<tr>
<td>175</td>
<td>Obese</td>
</tr>
</tbody>
</table>

**Source:**
Measuring Calf Circumference (in cm)

- Place subject sitting with left leg hanging loosely or standing with their weight evenly distributed on both feet
- Have them roll up their trouser leg to uncover calf
- Wrap tape measure around calf at a right angle at the widest part & take measurement
- Repeat above and below to ensure you have the widest part of calf
MNA® - SF (Chinese)

Mini Nutritional Assessment MNA®

MNA® - Full Form (Chinese)

Mini Nutritional Assessment MNA®
Recommendations for Intervention

MNA Score

Normally Nourished
12 – 14

At Risk of Malnutrition
8 – 11

Malnourished
0 – 7

No Weight Loss

Rescreen
- After acute event or illness
- Once per year in community dwelling elderly
- Every 3 months in institutionalized patients

MONITOR
- Close weight monitoring
- Rescreen every 3 months

TREAT
- Nutrition intervention
  - Diet enhancement
  - Oral nutritional supplementation (400 kcal/d)
- Close weight monitoring
- Further in-depth nutrition assessment

Weight Loss

TREAT
- Nutrition intervention
  - Oral nutritional supplementation (400-600 kcal/d)
- Diet enhancement
- Close weight monitoring
- Further in-depth nutrition assessment
“The ability of the new MNA®-SF to provide identical result categories, which are in high agreement with the full MNA®, allows for quicker nutrition intervention”
Nutrition Intervention prevents wt loss

- 80 patients; 75+ year old, at risk of malnutrition (MNA< 23.5).
- 2 month oral supplementation
- 2 servings/d → 500 kcal / 21g pro

Conclusion:
Use of daily oral supplementation during & after hospitalization maintains body wt and ↑ MNA score in patients at risk of malnutrition

Gazzotti C et al., Age & Ageing 2003;32:321-325
MNA® use in Long-term Care

- Ideal for use in long-term care
  - Population 65+
  - High risk of nutritional problems

- Should be part of nursing admission history
  - Routine part of Comprehensive Geriatric Assessment
  - Electronic medical record
  - Routine screening by dietitians and geriatrians

- Should be repeated frequently
  - Well Nourished: every 3 months
  - At risk: every 3 months unless signs of weight loss
  - Malnourished: monthly
Figure 4. MNA® and survival

MNA®, Mini Nutritional Assessment

MNA® in Community Care

• Easy to use for community nurses, dietitians and family doctors
• Good tool to use at health fairs to raise awareness of nutrition issues in elderly
• Lower prevalence of nutritional risk

• Study done in community physicians demonstrated rise in MNA in malnourished elderly
Adjusted nutritional status as a function of time & ONS

- Observational, prospective, cohort study with a 12 month follow up in 90 practitioners in France
- Two groups of MDs selected on historical prescribing practice
- Group 1 = low freq use of ONS
- Group 2 = high freq use of ONS
- Higher % patients with higher MNA scores and on ONS in Group 2 over time

Arnaud-Battandier, et al, Clin Nutr 2004
Case study- Mrs. Lee

Mrs. Lee is a 75-year-old widow with 2 children.
She is now living in a nursing home. She can feed herself with some assistance by the nursing aid.
She has fair appetite and has lost about 1.5 kg in the past 3 months.
Her current weight is 48 kg and her height is 158 cm with BMI of 19.2.
She is partially mobile and requires the use of wheelchair since she had a stroke about 1 year ago.
She has stable mood with no major illness and mental problems in the past 3 months.
**Case study - Mrs. Lee**

- She has fair appetite in the past 3 months (1)
- She has lost about 1.5 kg in the past 3 months (2)
- She is partially mobile and requires the use of a wheelchair (1)
- She has stable mood with no major illness in the past 3 months (2)
- She has no major mental health problems in the past 3 months (2)
- Her current BMI is 19.2 (1)

**Mini Nutritional Assessment (MNA)**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Appetite</strong></td>
<td></td>
</tr>
<tr>
<td>- In the past 3 months</td>
<td></td>
</tr>
<tr>
<td>1. Appetite</td>
<td></td>
</tr>
<tr>
<td>2. Appetite</td>
<td></td>
</tr>
<tr>
<td><strong>B. Weight Loss</strong></td>
<td></td>
</tr>
<tr>
<td>- In the past 3 months</td>
<td></td>
</tr>
<tr>
<td>1. Weight loss</td>
<td></td>
</tr>
<tr>
<td>2. Weight loss</td>
<td></td>
</tr>
<tr>
<td><strong>C. Physical Activity</strong></td>
<td></td>
</tr>
<tr>
<td>- In the past 3 months</td>
<td></td>
</tr>
<tr>
<td>1. Physical Activity</td>
<td></td>
</tr>
<tr>
<td>2. Physical Activity</td>
<td></td>
</tr>
<tr>
<td><strong>D. Mood and Mental Health</strong></td>
<td></td>
</tr>
<tr>
<td>- In the past 3 months</td>
<td></td>
</tr>
<tr>
<td>1. Mood and Mental Health</td>
<td></td>
</tr>
<tr>
<td>2. Mood and Mental Health</td>
<td></td>
</tr>
<tr>
<td><strong>E. Functional Status</strong></td>
<td></td>
</tr>
<tr>
<td>- In the past 3 months</td>
<td></td>
</tr>
<tr>
<td>1. Functional Status</td>
<td></td>
</tr>
<tr>
<td>2. Functional Status</td>
<td></td>
</tr>
<tr>
<td><strong>F. BMI (Body Mass Index)</strong></td>
<td></td>
</tr>
<tr>
<td>- BMI (kg/m²)</td>
<td></td>
</tr>
<tr>
<td>0. BMI (kg/m²)</td>
<td></td>
</tr>
<tr>
<td>1. BMI 18.5 to 20</td>
<td></td>
</tr>
<tr>
<td>2. BMI 21 to 22</td>
<td></td>
</tr>
<tr>
<td>3. BMI 23 or Over</td>
<td></td>
</tr>
</tbody>
</table>

**Total Score**: 9 out of 14

**Conclusion**: At risk of malnutrition
1. Total score = 9 out of 14
   = at risk of malnutrition
2. Weight loss of 1.5 kg in the past 3 months
Overview

www.mna-elderly.com

What is the MNA®?

The MNA® is a validated nutrition screening and assessment tool that can identify geriatric patients age 65 and above who are malnourished or at risk of malnutrition.

What is the latest news about the MNA®?

Recent research presented in July at the IAGG congress in Paris has resulted in the launch of a new, revised MNA® Short Form. This new MNA® Short Form is now validated as a stand-alone tool. Calf circumference has also been determined to be a valid alternative when BMI is not available. The new MNA® Short Form now also classifies the elderly as well-nourished, at risk, or malnourished vs completion of the full MNA® for nutritional status classification. These changes to the MNA® Short Form facilitate its use across care settings and make it much more user-friendly.

Find more information on this new research below.

- JNHA article
- News release
- IANA abstract
- ESPEN abstract

New MNA® Video

Nutrition screening as easy as the MNA

- click here -

MNA® Webinars

Experience presentations from the revised MNA-SF researchers as if you were there

Clinical Program, IAGG 2009 Paris
VALIDATION OF THE MINI NUTRITIONAL ASSESSMENT SHORT-FORM (MNA-SF): A PRACTICAL TOOL FOR IDENTIFICATION OF NUTRITIONAL STATUS


The Mini Nutritional Assessment (MNA) is a valid nutritional screening tool for free-living and clinically relevant elderly populations (1, 2). The MNA contains geriatric-specific assessment questions related to nutritional and health conditions, independence, quality of life, cognition, mobility and subjective health (3). The MNA is recommended for routine geriatric assessments by the European Society for Clinical Nutrition and Metabolism (ESPEN) (4). The MNA is easily completed within 10 to 15 minutes time (1, 2), but the MNA is used infrequently in some acute care settings due in part to the time needed to complete it (3, 5). To reduce this short time burden further, Rubenstein and colleagues developed a six question MNA short-form (MNA-SF) by identifying a subset of questions from the full MNA that had high sensitivity, specificity and correlation to the full MNA (5). This original MNA-SF identifies elderly individuals as well nourished or at risk of malnutrition so that the full MNA is needed only if a patient is classified as at risk. The diagnostic accuracy of this original MNA-SF in identifying the elderly as well nourished is comparable to the full MNA, and it can be a valid time saving alternative.

The clinical utility of the MNA and MNA-SF is challenged by several short screening tools such as the Malnutrition Universal Screening Tool (MUST) (6), the Short Nutritional Assessment Questionnaire (SNAQ) (7) and the Nutritional Risk Screening 2002 (NRS 2002) (8). The merits of these short screening tools have been discussed previously (9), but these short, rapid screens are specifically not designed for clinical use in geriatric medicine. However they are frequently applied to some elderly patients because they are short, quick and easy to use.

Many nutritional and geriatric assessment/screening tools require the body mass index (BMI) including the full MNA. In some clinical and free living settings, measuring weight and height for the BMI can be time-consuming particularly in bedridden and immobile elderly patients. Also, in some Asian and African populations, weight and thus BMI are not common health measures (10). Calorific circumference (CC) and mid-arm circumference (MAC) are possible alternatives to BMI because they can be taken easily with a tape measure, and they are also part of the full MNA (11). With the exception of a nutrition screening tool for South African elderly that includes only MAC (10), there are no screening instruments for the elderly

Take home messages

- Malnutrition is highly prevalent in the elderly population.
- A recent international database reconfirms that the original MNA®-SF is a well validated screening tool and can be used standing alone.
- When BMI cannot be obtained, calf circumference may be substituted to complete the 6-item MNA®-SF.
- The MNA® remains the most well validated and primary nutrition screening tool for the elderly.
- Nutrition intervention prevents morbidity and mortality in the elderly.
Thank you

謝謝
The Nestlé Nutrition Institute (NNI) fosters "Science for better Nutrition"

.. because we are convinced that innovative, science-based nutrition can help enhance the quality of people's lives all over the world

Our activities focus on information sharing, education and training
Nutrition screening
As easy as mna®

The MNA® (Mini Nutritional Assessment) is the most validated screening tool for the elderly. Quick, easy to use and effective, the MNA® was designed to address the nutrition aspects of the Comprehensive Geriatric Assessment.

Most validated tool for the elderly
- Sensitive and reliable
- Recommended by national and international organisations
- Supported by more than 400 published studies

Quick and easy to use
- Screen in less than 4 minutes
- Requires no special training

Effective
- Identifies at-risk persons before weight loss occurs
- Facilitates early intervention

www.mna-elderly.com
Visit our new, re-designed website

*Société des Produits Nestlé S.A., Vevey, Switzerland, Trademark Owner.
What are the physiological changes with aging?

- Changes in Body Composition
  - Declining muscle mass
  - Increasing fat mass
  - Declining bone density

- Changes in Cognitive Function

- Immunosenescence
  - Less effective immune system
  - Chronic low grade inflammation
100 JAHRE
NA UND?
16.5% of population by 2050

Global Elderly Population Compared to Total Population: 2002-2050

The number of elderly is expected to grow very rapidly during the coming five decades.

Global population 65+:
- 2000 - 606 Million
- 2050 – 1.9 Billion
Almost 25% of Asian population in 2050
Life expectancy in Asia

- Average life expectancy in many Asian countries is > 70 years while the world average is 67.2 years
  - Rank #1 - Japan has the highest overall life expectancy – 82.6 years
  - Rank #2 – Hong Kong – 82.2 years
  - Rank #15 – Singapore – 80.0 years
  - Rank # 52 – Taiwan – 78.0 year
  - Rank # 65 - Malaysia -74.2 years
  - Rank # 100 - Philippines – 71.1 years
  - Rank # 110 – Indonesia – 70.7 years
  - Rank #111- Thailand – 70.6 years

CIA world factbook 2009
Chronic Disease and Malnutrition

Malnutrition:
- A common consequence of chronic disease
- 38% of community dwelling elderly are at risk of malnutrition or malnourished

88% of those aged 65+ have 1 or more chronic conditions
Average person aged 85+ has 2 – 3 chronic conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>37</td>
<td>26</td>
</tr>
<tr>
<td>Hypertension</td>
<td>52</td>
<td>54</td>
</tr>
<tr>
<td>Stroke</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Asthma</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Chronic bronchitis or Emphysema</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Any cancer</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Diabetes</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Arthritis</td>
<td>43</td>
<td>54</td>
</tr>
</tbody>
</table>

Note: data are based on a 2-year average from 2005-2006.
Reference population: these data refer to the civilian non-institutionalized population.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey.
Malnutrition in the Elderly

**Hospital**
- Malnourished: 39%
- At risk of malnutrition: 47%
- Well nourished: 14%

86% of patients were either malnourished or at risk of malnutrition. (n=1,384 patients)

**Nursing home**
- Malnourished: 14%
- At risk of malnutrition: 53%
- Well nourished: 33%

67% of patients were either malnourished or at risk of malnutrition. (n=1,586 patients)

**Community**
- Malnourished: 6%
- At risk of malnutrition: 32%
- Well nourished: 62%

38% of patients were either malnourished or at risk of malnutrition. (n=964 patients)

**Rehabilitation**
- Malnourished: 50%
- At risk of malnutrition: 41%
- Well nourished: 9%

91% of patients were either malnourished or at risk of malnutrition. (n=340 patients)

Malnutrition Impacts Outcome

Up to 3 times higher risk of infection\(^{20}\)

<table>
<thead>
<tr>
<th></th>
<th>Well</th>
<th>Moderately</th>
<th>Severely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noocominal Infections %</td>
<td>4.4%</td>
<td>7.6%</td>
<td>14.6%</td>
</tr>
</tbody>
</table>

A longer length of hospital stay\(^{16}\)

<table>
<thead>
<tr>
<th></th>
<th>Well</th>
<th>Moderately</th>
<th>Severely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay (days)</td>
<td>3.9%</td>
<td>5.4%</td>
<td>10.8%</td>
</tr>
</tbody>
</table>

Schneider SM et al BMJ 2004
Pichard et al. AJCN 2004
Patients at risk for malnutrition
↑ hospital costs

Source: Chima et al., 1997.

* Includes hospital costs only, such as per diem, laboratory tests, medications, therapies and procedures; excludes physician fees. 

p<0.02
Nutritional Intervention in the Growing Older Population

"Nutritional intervention holds the promise of mitigating the growing burden of chronic disease and disability and improving the quality of life of the rapidly growing older population."

Geriatric Nutrition, ed. Morley, Thomas, 2007
Outlines

- Malnutrition in the elderly population
- Nutrition screening and intervention for the elderly population
- Introduction of Mini Nutrition Assessment (MNA®)
- Application of Mini Nutrition Assessment (MNA®) in different settings
- Mini Nutrition Assessment (MNA®) resources