Wasting away
on Tea and Toast
Sarcopenia and Falls Prevention Seminar
2017

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Acknowledgements

• Queeny Lau, former CHSP Dietitian, Hornsby
• Heidi lee- current CHSP Dietitian, Hornsby
• Rudi Bartl, Community Dietitian, Gosford
• Beryl Dawson, Senior Clinical Dietitian, Balmain Hospital
Overview

• Nutrition and Sarcopenia

• How to identify nutrition risk

• How diet can minimise muscle wasting
“My teacher says little girls can grow up to be anything they choose! Why did you choose to be an old lady?”
Muscle Loss

Same weight
Different shape

“[Younger] I’ll be back!”

“[Older] Oh, my back!”

Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
Muscle Mass

Skin integrity and Wound Healing

Healthy weight

Vitamins and Minerals

Prevent chronic disease

Bone health

Immune system
What is your approach?

• “Have you noticed any changes in your weight?”
• “Have your clothes/rings/dentures become a bit loose?”
• “How has your appetite been? Has it been less than usual?”
• “How are you managing with the cooking and shopping?”
• “Have you thought about using a meal service or getting some extra help with meal preparation?”
Nutrition Risk Screening

• How does your staff, service or organisation
  – Identify and report nutrition risk?
  – Manage nutrition risk?
  – Talk to clients about nutrition concerns
Community Nutrition Screening tools

• Malnutrition Screening Tool ‘MST’
  – 3 x simple questions
  – Quick and easy
  – Tends to overestimate risk (might need further Q’s)

• Mini Nutrition Assessment- SF (MNA)
  – Identifies risk, then screens for malnutrition

• HACC Screening tool
  – More ticks = more risk
  – Good ‘conversational’ tool

**See ‘Eating Well’ Manual in references for full resources**
Malnutrition Screening Tool (MST)

The MST is a tool developed by Australian researchers which is quick and simple (less than 5 minutes) to use. It has been shown to be a valid tool. Minimal calculations are required; it asks about appetite and recent weight loss. A score 2 or more indicates a risk of malnutrition.

Have you lost weight recently without trying?
If No .................................................. 0
If Unsure ............................................. 2

If Yes, how much weight (kg) have you lost?
From 0.5 to 5.0kg .................................... 1
From 5.0 to 10.0kg ................................... 2
From 10.0 to 15.0kg .................................. 3
More than 15.0kg .................................... 4
Unsure ................................................... 2

Have you been eating poorly because of a decreased appetite?
No ...................................................... 0
Yes ..................................................... 1

<table>
<thead>
<tr>
<th></th>
<th>Low risk: MST = 0-1</th>
<th>At risk: MST = 2 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
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Simplified Nutritional Appetite Questionnaire (SNAQ)

The SNAQ requires no measuring of weight or height and is quick to complete. It can assist to identify if you may lose weight in the future.
You must be able to answer the 4 questions.

Name: ......................................................... Age: .........................................................
Screening date: ...........................................

ADMINISTRATION INSTRUCTIONS
Answer the following questions and then tally the results.
The sum of the scores for the individual items constitutes the SNAQ score.

A. My appetite is
   Very poor = 1
   Poor = 2
   Average = 3
   Good = 4
   Very good = 5

B. When I eat,
   I feel full after eating only a few mouthfuls = 1
   I feel full after eating about a third of a meal = 2
   I feel full after eating over half a meal = 3
   I feel full after eating most of the meal = 4
   Hardly ever feel full = 5

C. Food tastes
   Very bad = 1
   Bad = 2
   Average = 3
   Good = 4
   Very good = 5

D. Normally I will eat
   Less than one meal a day = 1
   One meal a day = 2
   Two meals a day = 3
   Three meals a day = 4
   More than three meals a day = 5

SNAQ score of 14 or less predicts significant risk of at least 5% weight loss within six months. Refer to diettian for nutrition management plan.
Mini Nutritional Assessment - Short Form (MNA-SF)

The MNA-SF focusses on BMI, weight loss, mobility, stress or illness, poor appetite, dementia/depression. If BMI can’t be obtained, calf circumference can be used instead. A score of 11 or less indicates nutrition risk. This means that you require a full nutritional assessment using the full MNA by a dietitian or other professional trained in its use.

<table>
<thead>
<tr>
<th>Screening</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>A. Has food intake decreased over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?</td>
<td></td>
</tr>
<tr>
<td>0 = severe decrease in food intake</td>
<td></td>
</tr>
<tr>
<td>1 = moderate decrease in food intake</td>
<td></td>
</tr>
<tr>
<td>2 = no decrease in food intake</td>
<td></td>
</tr>
<tr>
<td>B. Weight loss during the last 3 months</td>
<td></td>
</tr>
<tr>
<td>0 = weight loss greater than 3 kg (6.6 lbs)</td>
<td></td>
</tr>
<tr>
<td>1 = does not know</td>
<td></td>
</tr>
<tr>
<td>2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)</td>
<td></td>
</tr>
<tr>
<td>3 = no weight loss</td>
<td></td>
</tr>
<tr>
<td>C. Mobility</td>
<td></td>
</tr>
<tr>
<td>0 = bed or chair bound</td>
<td></td>
</tr>
<tr>
<td>1 = able to get out of bed / chair but does not go out</td>
<td></td>
</tr>
<tr>
<td>2 = goes out</td>
<td></td>
</tr>
<tr>
<td>D. Has suffered psychological stress or acute disease in the past 6 months?</td>
<td></td>
</tr>
<tr>
<td>0 = yes</td>
<td></td>
</tr>
<tr>
<td>2 = no</td>
<td></td>
</tr>
<tr>
<td>E. Neuropsychological problems</td>
<td></td>
</tr>
<tr>
<td>0 = severe dementia or depression</td>
<td></td>
</tr>
<tr>
<td>1 = mild dementia</td>
<td></td>
</tr>
<tr>
<td>2 = no psychological problems</td>
<td></td>
</tr>
</tbody>
</table>

F1 Body Mass Index (BMI) (weight in kg) / (height in m²)

<table>
<thead>
<tr>
<th>BMI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = BMI less than 19</td>
<td></td>
</tr>
<tr>
<td>1 = BMI 19 to less than 21</td>
<td></td>
</tr>
<tr>
<td>2 = BMI 21 to less than 23</td>
<td></td>
</tr>
<tr>
<td>3 = BMI 23 or greater</td>
<td></td>
</tr>
</tbody>
</table>

F2 Calf circumference (CC) in cm

<table>
<thead>
<tr>
<th>CC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = CC less than 31</td>
<td></td>
</tr>
<tr>
<td>1 = CC 31 or greater</td>
<td></td>
</tr>
</tbody>
</table>

Screening score (max. 14 points)

<table>
<thead>
<tr>
<th>Points</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-14</td>
<td>Normal nutritional status</td>
</tr>
<tr>
<td>8-11</td>
<td>At risk of malnutrition</td>
</tr>
<tr>
<td>0-7</td>
<td>Malnourished</td>
</tr>
</tbody>
</table>


For more information: www.mna-sf.info
Optimal Nutrition

• Minimise muscle wasting
• Maximise independence, improve function
  – Reduce falls, hospitalisation
• Support immunity, skin integrity
• Minimise bone loss – Calcium and Vitamin D
• Improve glycaemic control (UTI, Wounds)
• Hydration
Maintaining Muscle Mass and Function

- **Synthesis**
- **Muscle Growth**
- **Hormones**
- **Exercise**
- **Protein**

- **Breakdown**
- **Malnutrition**
- **Inactivity**
- **Illness/Injury**
- **Muscle Loss**

Courtesy: Douglas Paddon Jones
Australian Dietary Guidelines 2012

• NOTE: New guidelines should be applied to frail elderly with care

• Notable changes

  Recommendations for over 70’s
  - Protein ↑
  - Calcium ↑
  - Carbohydrate ↓
Falls and nutrition- considerations

• Adequate vitamin D (check levels and supplement if required)

• Adequate hydration: 6-8 cups of fluid, consider protein rich drinks e.g. dairy, supplements, added whey protein

• Calcium- 3-4 serves/day for older people or consider supplementation
  1 serve is:
  • 1 cup of milk
  • 200g yoghurt
  • 2 x slices cheese
  • Cup of tinned fish with bones
  • Cup of almonds
Dietary Management of Sarcopenia

• **Role of diet**
  – Individualised approach
  – Balanced intake from core food groups
  – At least three regular meals per day
  – Nourishing midmeals if appetite is poor
  – Supplement drinks

• **Proteins**
Role of Protein

• What are the best proteins to have?
  – Easy to digest and absorb

• When is the best time to have protein?
  – Every meal and after exercise

• How much protein should we have?
  – 2-2½ serves of protein for 70 yo+
  – RDI: 1-1.5g protein/kg Body Weight/Day
Leucine

- Proteins digest at different rates
- Leucine is an Essential Amino Acid (EAA)
- Induces muscle protein synthesis (MPS) via the mTOR (mammalian target of rapamycin) pathway
- Surges of leucine raises amino acids in blood for making muscles
- Whey protein isolate (WPI) digests quickly and has higher leucine content
Leucine

• Recommended Daily intake is 3g/day for healthy young
• In elderly, 6-12g/day for muscle synthesis
• Milk based products, meat, fish
• Look for whey protein isolate (WPI) in ingredients
• Aim for ~ 2g per meal – regular surges or boluses rather than ‘dribbles’

Morley et al
<table>
<thead>
<tr>
<th>Food item</th>
<th>Leucine mg/serve</th>
<th>Serving to provide 2g of leucine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread 1 slice</td>
<td>247</td>
<td>9 slices</td>
</tr>
<tr>
<td>Meat 100g</td>
<td>2000</td>
<td>100g cooked</td>
</tr>
<tr>
<td>Tuna 100g</td>
<td>2000</td>
<td>100g tin</td>
</tr>
<tr>
<td>Egg 50g</td>
<td>589</td>
<td>3</td>
</tr>
<tr>
<td>Rice 1/3 cup</td>
<td>100</td>
<td>6 cups</td>
</tr>
<tr>
<td>Potato 1 med 100g</td>
<td>120</td>
<td>18</td>
</tr>
<tr>
<td>Lentils 100g</td>
<td>600</td>
<td>350g (one tin)</td>
</tr>
<tr>
<td>Milk 140ml</td>
<td>453</td>
<td>600ml</td>
</tr>
<tr>
<td>Yoghurt 100g</td>
<td>500</td>
<td>400g</td>
</tr>
<tr>
<td>Soy milk 140ml</td>
<td>311</td>
<td>900ml</td>
</tr>
<tr>
<td>Cheese 30g (slice)</td>
<td>668</td>
<td>3 slices</td>
</tr>
<tr>
<td>Almonds handful 30-40 nuts</td>
<td>500</td>
<td>95 nuts ~130g</td>
</tr>
<tr>
<td>Whey protein isolate</td>
<td>2000</td>
<td>20g</td>
</tr>
</tbody>
</table>
Examples of meals

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
0.7g Leucine

28-30g protein total
- 2g leucine if all consumed
- 1.3g leucine if nil hot consumed

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
2-3g protein (0.209g leucine)

10g protein
(0.668g leucine) cheese
(0.34g leucine) 2 bread
1g leucine total

0-5g protein

12-18g total protein

~1g leucine

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
24g protein (2.034g leucine)

5g protein (0.642g leucine)

3-5g protein (0.387g leucine)

32-34g total protein
~3g leucine

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
Typical Protein Distribution

Figure: Common eating patterns. Small serves of protein do not provide adequate EAA for MPS.

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
Ideal Protein Distribution

Figure: Ideal protein distribution of ~30g high quality protein at each meal. Provides adequate EAA for MPS in a bolus amount, too little and MPS is not induced too much and protein is "wasted".

Courtesy of Beryl Dawson – Senior Clinical Dietitian Balmain Hospital
Post exercise

- Exercise without food results in **negative** protein balance.
- Resistance exercise combined with amino acid ingestion elicits the greatest anabolic response when protein is ingested following exercise.  
  (Breen 2011)
Practical ideas

• Have protein at every meal, breakfast, lunch and dinner
• FORTIFY foods with skim milk powder e.g. mashed potato, omelette, pasta bake, custard
• Supplement drinks –
  – Supplement NOT replace meals
  – Has a role for post exercise
  – Take supplements after meals especially a protein poor meal
Barriers to change

• Cost – Whey protein Isolate $50/Kg
• Affordability
• Palatability
Take home messages

• You CAN build muscles with diet
• Fasting increases muscle breakdown
• You need regular doses of protein (high bioavailability)
• Regular boluses of Leucine (essential amino acid) of at least 2g is needed for building of muscle
‘Eating Well’ A Nutrition resource for Older People, their support workers and carers- Carolyn Bunney and Rudi Bartl, Central Coast Local Health District

Resources

• Eat to Cheat Ageing, Ngaire Hobbins, Dietitian
References and further reading

• Breen, L & Phillips, S, Skeletal muscle protein metabolism in the elderly: Interventions to counteract the ‘anabolic resistance’ of ageing *Nutrition and Metabolism* 2011 vol. 8


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• Paddon-Jones D et al Role of dietary protein in the sarcopenia of aging *Am J of Clin Nutr* 2008 May vol. 87 no. 5 1562S-1566S