Malnutrition in the community – everyone's responsibility?

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Introduction

• Context

• NUTRICOM study
  • Aims and objectives
  • Data collection

• Preliminary results
  • Recruitment issues
  • Baseline characteristics
  • Nutrition risk status
  • Functional status
  • Quality of life
  • Contact with health and social care professionals
  • Nutritional care
Malnutrition

- A state of nutrition in which a deficiency or excess (or imbalance) of energy, protein and other nutrients causes measurable adverse effects on tissue and/or body function and clinical outcome.

- *Starvation-related malnutrition* e.g. resulting from social and/or psychological or environmental issues.

- *Disease-related malnutrition*  
  - Chronic e.g. associated with COPD or chronic kidney disease.  
  - Acute e.g. associated with severe illness or injury.

*Elia (2005) ; Jensen et al., (2010)*
Malnutrition

- 3 million (5%) malnourished or at risk of malnutrition at any time in the UK
- 1.1 million aged over 65 years old
- 400,000 across London (120,000 aged over 65 years)

(BAPEN, 2011)
Impact of malnutrition

• **Patient**
  - ↓ muscle strength
  - ↓ mood
  - ↓ ability to perform everyday tasks
  - ↓ quality of life
  - ↑ risk of infections
  - ↓ recovery
  - ↑ mortality

• **Family and carers**
  - 60% carers worry about nutrition
  - 25% care for someone who is underweight
  - 16% care for someone who is nutritionally vulnerable and has no nutritional support

• **Health and social care services**
  - 2 x GP visits
  - 3 x hospital admissions
  - ↑ packages of care
  - ↑ discharged to care homes
  - 2 x healthcare costs

*Stratton, Green & Elia (2003)*
*Carers UK (2012)*
*Wilson (2014); Guest et al. (2011); Elia & Russell (2009)*
Why do older people become malnourished?

<table>
<thead>
<tr>
<th>Psychological</th>
<th>Disease effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia</td>
<td>Disease severity</td>
</tr>
<tr>
<td>Depression</td>
<td>Inflammatory response</td>
</tr>
<tr>
<td>Bereavement</td>
<td>GI function</td>
</tr>
<tr>
<td>Mental illness</td>
<td>Pain</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Co-morbidities</td>
</tr>
<tr>
<td>Apathy</td>
<td>Dentition</td>
</tr>
<tr>
<td>Motivation</td>
<td>Swallowing difficulties</td>
</tr>
<tr>
<td>Loneliness</td>
<td>Medical interventions</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>Surgery</td>
</tr>
<tr>
<td>Independence</td>
<td>Medication</td>
</tr>
<tr>
<td>Substance abuse</td>
<td></td>
</tr>
</tbody>
</table>

Social

| Financial issues               |                                                    |
| Social isolation               |                                                    |
| Access to shops                |                                                    |
| Access to health and social care services |        |
| Social networks               |                                                    |
Managing malnutrition – everyone’s responsibility

General Practitioners

Neighbours

Dietitians

Physiotherapists

Opticians

Occupational Therapists

Nurses

Dentists

Pharmacists

Health visitors

Speech & Language Therapists

Friends

Social workers

Voluntary sector

Meals-on-wheels

Home care assistants
Malnutrition: everyone’s responsibility

...and no-one’s responsibility
Potential interventions

- Oral nutritional supplements
- Dietary counselling
- Help with shopping, menu planning and meal preparation from paid and informal carers
- Home meal delivery services
- Lunch clubs and social eating
- Befriending services
- Cookery classes
- Exercise classes

NUTRICOM study - Aims

To determine the impact of nutrition risk status on:

• hospitalisation and use of community health and social care services and the associated costs
• patient-centred outcomes i.e. quality of life (including nutrition-related satisfaction with life) and quality adjusted life years (QALYs), activities of daily living, clinical condition (falls, pressure sores and infections) and mortality

To determine the proportion of medium/high risk individuals receiving nutritional interventions in the community and to capture data on the nature and extent of any such interventions

To use the data generated to inform future research on community-based nutritional interventions for older people at risk of malnutrition
Inclusion and exclusion criteria

INCLUSION

- Aged ≥ 60 years
- NHS number
- Capable of giving informed consent or formal written assent from NOK
- Capable of being weighed or mid-arm circumference measurement undertaken
- and having either a record of height measurement or height estimated using ulna length
- Not receiving end-of-life care

EXCLUSION

- Incapable of giving informed consent and no consultee available
- Unlikely to live for more than three months (as assessed by a consultant or GP in accordance with local policies)
- Receiving haemodialysis or artificial nutrition at discharge from hospital since these patients will have dedicated pathways of nutritional care already set up (acute hospital only)
Trial diagram

Baseline assessment
- Patient interview
- Demographics including date of birth, sex, ethnicity, marital status and living conditions
- Nutrition risk status
- Health and social care use
- Quality of life
- Activities of daily living
- Falls
- Pressure sores
- Antibiotic use
- Satisfaction with food-related life (SWFL)
- Frailty score
- Handgrip strength
- Sarcopenia score
- Dietary intake (n = 100)
- Health records
- Nutritional interventions
- Mortality
- NHS number
- GP details
- Postcode
- Co-morbidities
- Nutritional interventions

3 month assessment
- Patient interview
- Changes in marital status, GP details, living conditions or post code
- Nutrition risk status
- Health and social care use
- Quality of life
- Activities of daily living
- Falls
- Pressure sores
- Antibiotic use
- SWFL
- Dietary intake (n = 100)
- Health records
- Nutritional interventions
- Mortality

6 month assessment
- Patient interview
- Changes in marital status, GP details, living conditions or post code
- Nutrition risk status
- Health and social care use
- Quality of life
- Activities of daily living
- Falls
- Pressure sores
- Antibiotic use
- SWFL
- Dietary intake (n = 100)
- Health records
- Nutritional interventions
- Mortality

12 month assessment
- Patient interview
- Changes in marital status, GP details, living conditions or post code
- Nutrition risk status
- Health and social care use
- Quality of life
- Activities of daily living
- Falls
- Pressure sores
- Antibiotic use
- SWFL
- Frailty score
- Handgrip strength
- Sarcopenia score
- Dietary intake (n = 100)
- Health records
- Nutritional interventions
- Co-morbidities
- Hospital admissions and associated costs
- Use of general practice and other community healthcare services and associated costs
- Mortality
Care settings

Lambeth and Southwark

• General practice i.e. The Hurley Clinic, Manor Place, Sir John Kirk Close and Streatham Common Group Practice

• Intermediate Care
  • Pulross Centre
  • Frailty Unit, St Thomas’ Hospital
  • @ Home Team
  • Early Rapid Response Team

• Community services
  • Voluntary sector organisations

Imperial Healthcare

• Hospital discharge (admissions, medical and older peoples’ wards)
  • Charing Cross Hospital
  • St Mary’s Hospital, Paddington
Power calculation

- Based on healthcare costs data from Guest et al. 2011
- To establish the impact on costs of being at medium/high risk versus low risk of malnutrition, it will be necessary to recruit an equal sample size in each group (i.e. two nutrition risk categories).
- Assuming a 95 % CI and with an 80 % power to detect a difference between the two groups, we need to recruit 72 patients in each of the two groups (i.e. low risk versus medium/high risk of malnutrition) i.e. 144 in each care setting
- Assuming a 20 % attrition rate, we will need to recruit 175 in each care setting i.e. a total of 700 participants

<table>
<thead>
<tr>
<th>Outcome at 6 months</th>
<th>Malnourished (n=1000)</th>
<th>Adequately nourished (n = 996)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare costs (£)</td>
<td>1753 (1628 – 1878)</td>
<td>750 (684 – 816)</td>
</tr>
<tr>
<td>Mortality</td>
<td>13 %</td>
<td>2 %</td>
</tr>
</tbody>
</table>
## Population statistics

<table>
<thead>
<tr>
<th></th>
<th>H &amp; F</th>
<th>K &amp; C</th>
<th>Lambeth</th>
<th>Southwark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>34.7</td>
<td>37.8</td>
<td>33.7</td>
<td>33.7</td>
</tr>
<tr>
<td>≥ 65 yrs</td>
<td>9%</td>
<td>12%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>White</td>
<td>68%</td>
<td>71%</td>
<td>57%</td>
<td>54%</td>
</tr>
<tr>
<td>African-Caribbean</td>
<td>12%</td>
<td>7%</td>
<td>26%</td>
<td>27%</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
<td>17%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>Mixed</td>
<td>5%</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Deprivation rank</td>
<td>18,913</td>
<td>22,636</td>
<td>15,052</td>
<td>5,720</td>
</tr>
</tbody>
</table>

Note: The deprivation rank is given as (33,844).
## Baseline data (to end January 2018)

<table>
<thead>
<tr>
<th>Care Setting</th>
<th>N</th>
<th>Age (years)</th>
<th>Completed N (%)</th>
<th>Withdrew N (%)</th>
<th>RIP N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practice</td>
<td>180</td>
<td>73.6 (8.4)</td>
<td>147 (82 %)</td>
<td>21 (12 %)</td>
<td>2 (1 %)</td>
</tr>
<tr>
<td>Community</td>
<td>51</td>
<td>75.7 (8.0)</td>
<td>31 (61 %)</td>
<td>12 (24 %)</td>
<td>2 (4 %)</td>
</tr>
<tr>
<td>Intermediate care</td>
<td>98</td>
<td>80.9 (8.3)</td>
<td>36 (36 %)</td>
<td>14 (14 %)</td>
<td>25 (25 %)</td>
</tr>
<tr>
<td>Hospital discharge</td>
<td>171</td>
<td>79.2 (9.9)</td>
<td>114 (67%)</td>
<td>28 (16%)</td>
<td>29 (17%)</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>77.0 (9.4)</td>
<td>328 (66%)</td>
<td>75 (15%)</td>
<td>58 (12%)</td>
</tr>
</tbody>
</table>

* Significant differences between care settings for all variables
# Baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>Living alone</th>
<th>Frailty score</th>
<th>SARC-F score</th>
<th>Family support N (%)</th>
<th>Paid carers N (%)</th>
<th>Meals-on-wheels N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Practice</strong></td>
<td>78 (43%)</td>
<td>1 (1, 6)</td>
<td>1 (0, 10)</td>
<td>26 (14%)</td>
<td>14 (8%)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>40 (78%)</td>
<td>1 (1, 6)</td>
<td>2 (0, 8)</td>
<td>13 (25%)</td>
<td>7 (14%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td><strong>Intermediate care</strong></td>
<td>51 (55%)</td>
<td>5 (2, 7)</td>
<td>6 (1, 10)</td>
<td>70 (71%)</td>
<td>54 (55%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td><strong>Hospital discharge</strong></td>
<td>99 (58%)</td>
<td>5 (1, 7)</td>
<td>4 (2, 7)</td>
<td>70 (41%)</td>
<td>49 (29%)</td>
<td>2 (1%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>265 (53%)</td>
<td>3 (1, 7)</td>
<td>3 (0, 10)</td>
<td>179 (36%)</td>
<td>124 (25%)</td>
<td>8 (1.5%)</td>
</tr>
</tbody>
</table>
## Baseline clinical condition

<table>
<thead>
<tr>
<th></th>
<th>Charlson Co-morbidity score</th>
<th>Fall in previous 12 mo. N (%)</th>
<th>Pressure sore present N (%)</th>
<th>Antibiotics in previous 12 mo. N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Practice</strong></td>
<td>3 (2, 11)</td>
<td>51 (28%)</td>
<td>2 (1%)</td>
<td>50 (28%)</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>4 (2, 9)</td>
<td>13 (25%)</td>
<td>0</td>
<td>18 (35%)</td>
</tr>
<tr>
<td><strong>Intermediate care</strong></td>
<td>6 (2, 15)</td>
<td>65 (65%)</td>
<td>19 (19%)</td>
<td>56 (56%)</td>
</tr>
<tr>
<td><strong>Hospital discharge</strong></td>
<td>5 (2, 11)</td>
<td>112 (65%)</td>
<td>21 (12%)</td>
<td>90 (53%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4.5 (2, 15)</td>
<td>241 (48%)</td>
<td>42 (8%)</td>
<td>214 (43%)</td>
</tr>
</tbody>
</table>
Nutrition screening

• **MUST (Elia 2003)**
  - BMI < 20 kg/m²
  - % weight loss in past 3-6 months
  - Acute illness impact

• **GSTT tool (Weekes et al. 2004)**
  - Weight loss in past 3-6 months
  - Decreased intake in past 3-6 months
  - BMI < 18.5 kg/m²

• **NRS-2002 (Kondrup et al. 2003)**
  - BMI < 20.5 kg/m²
  - Weight loss in 3 months
  - Poor intake in past week
  - Acute illness impact
  - Age ≥70

---

**'MUST' Tool**

- **Step 1**
  - BMI (kg/m²)
    - >20 (≥30 Obese) = 0
    - 18.5—20 = 1
    - <18.5 = 2

- **Step 2**
  - Unplanned weight loss in past 3-6 months (%)
    - <5 = 0
    - 5-10 = 1

- **Step 3**
  - If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days

- **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

**Low Risk**
- Routine clinical care
  - Ensure appropriate food and drink choices
  - Repeat screening every 3-6 months, unless there is clinical concerns.
  - Document action taken

**Medium Risk**
- Observe
  - Follow MUST 1 care pathway on page 10 of Guidelines Booklet

**High Risk**
- Treat
  - Follow action plan for medium risk
  - Refer to Dietitian
  - Re-weigh weekly
  - Document action taken unless detrimental or no benefit is expected from nutritional support e.g. end of life care pathway

This tool is to assist your assessment. If in doubt, use your professional judgement.

[http://www.bapen.org.uk/screening-for-malnutrition/must/introducing-must](http://www.bapen.org.uk/screening-for-malnutrition/must/introducing-must)
Currently unable to allocate nutrition risk category (MUST):
• 16 (5 %) could not be weighed at baseline (mid arm circumference)
• 39 (12 %) had no idea at all of ‘usual weight’
• 61 (19 %) were unsure when they were last weighed
• 59 (18 %) could not report a weight within previous 12 months
• 127 (39 %) could report a “recent weight” (within previous 3 – 6 months)

Currently reviewing electronic healthcare records to determine the proportion of subjects with a documented “recent weight”

Implications for completing MUST in the community and cross-boundary communication of nutrition risk status
## Baseline nutrition risk status

<table>
<thead>
<tr>
<th></th>
<th>Weight kg Mean (SD)</th>
<th>BMI kg/m² Mean (SD)</th>
<th>BMI &lt;20kg/m² N (%)</th>
<th>BMI &lt;18.5kg/m² N (%)</th>
<th>Reported weight loss N (%)</th>
<th>Reported poor intake N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Practice</strong></td>
<td>72.9 (16.1)</td>
<td>26.6 (5.6)</td>
<td>12 (7%)</td>
<td>3 (2%)</td>
<td>18 (10%)</td>
<td>19 (11%)</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>69.3 (16.7)</td>
<td>26.7 (5.9)</td>
<td>1 (2%)</td>
<td>1 (2%)</td>
<td>23 (45%)</td>
<td>11 (22%)</td>
</tr>
<tr>
<td><strong>Intermediate care</strong></td>
<td>70.2 (18.6)</td>
<td>25.2 (6.5)</td>
<td>15 (16%)</td>
<td>8 (9%)</td>
<td>37 (38%)</td>
<td>52 (53%)</td>
</tr>
<tr>
<td><strong>Hospital discharge</strong></td>
<td>65.2 (17.8)</td>
<td>24.8 (6.2)</td>
<td>41 (24%)</td>
<td>21 (12%)</td>
<td>95 (56%)</td>
<td>72 (42%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>69.4 (17.5)</td>
<td>25.8 (6.0)</td>
<td>69 (14%)</td>
<td>33 (7%)</td>
<td>173 (35%)</td>
<td>154 (31%)</td>
</tr>
</tbody>
</table>
Outcome measures

- Functional measures
  - Activities of daily living (Modified Townsend Score)
  - Handgrip strength

- Quality of Life
  - EQ-5D Visual Analogue Scale
  - EQ-5D-5L Utility Score

- Health and social care costs
  - Client Service Inventory (health and social care)
  - Hospital, GP and community health services
Baseline functional status and quality of life

<table>
<thead>
<tr>
<th></th>
<th>Handgrip strength</th>
<th>ADL score</th>
<th>EQ-5D-VAS score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Practice</strong></td>
<td>29.8 (12.6)</td>
<td>6 (12)</td>
<td>81 (17)</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>25.4 (11.8)</td>
<td>12 (17)</td>
<td>82 (15)</td>
</tr>
<tr>
<td><strong>Intermediate care</strong></td>
<td>18.4 (9.4)</td>
<td>46 (20)</td>
<td>54 (22)</td>
</tr>
<tr>
<td><strong>Hospital discharge</strong></td>
<td>18.7 (8.2)</td>
<td>27 (22)</td>
<td>58 (26)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23.5 (11.8)</td>
<td>22 (23)</td>
<td>69 (25)</td>
</tr>
</tbody>
</table>
## Quality of life and indicators of nutritional risk (n = 350)

<table>
<thead>
<tr>
<th></th>
<th>Higher risk</th>
<th>Lower risk</th>
<th>P (95 % CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQ-5D VAS score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight loss in previous 3-6 months</td>
<td>58.0 (27.0)</td>
<td>76.0 (21.7)</td>
<td>&lt;0.001 (12.2, 23.8)</td>
</tr>
<tr>
<td>Poor intake in previous 3-6 months</td>
<td>57.8 (28.3)</td>
<td>74.7 (22.1)</td>
<td>&lt;0.001 (10.4, 23.3)</td>
</tr>
<tr>
<td>BMI &lt; 25 kg/m²</td>
<td>70.3 (26.0)</td>
<td>70.8 (23.3)</td>
<td>0.848 (-5.7, 4.7)</td>
</tr>
<tr>
<td>BMI &lt; 23 kg/m²</td>
<td>68.1 (27.2)</td>
<td>71.9 (23.1)</td>
<td>0.200 (-9.5, 2.0)</td>
</tr>
<tr>
<td>BMI &lt; 20 kg/m²</td>
<td>65.0 (28.6)</td>
<td>71.5 (23.8)</td>
<td>0.127 (-14.9, 1.9)</td>
</tr>
<tr>
<td>BMI &lt; 18.5 kg/m²</td>
<td>59.2 (27.2)</td>
<td>71.4 (24.3)</td>
<td>0.047 (-24.2, -0.2)</td>
</tr>
<tr>
<td><strong>EQ-5D-5L utility index score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight loss in previous 3-6 months</td>
<td>0.64 (0.32)</td>
<td>0.84 (0.23)</td>
<td>&lt;0.001 (0.13, 0.26)</td>
</tr>
<tr>
<td>Poor intake in previous 3-6 months</td>
<td>0.63 (0.32)</td>
<td>0.83 (0.24)</td>
<td>&lt;0.001 (0.12, 0.27)</td>
</tr>
<tr>
<td>BMI &lt; 25 kg/m²</td>
<td>0.76 (0.28)</td>
<td>0.81 (0.27)</td>
<td>0.111 (-0.10, 0.01)</td>
</tr>
<tr>
<td>BMI &lt; 23 kg/m²</td>
<td>0.73 (0.30)</td>
<td>0.82 (0.25)</td>
<td>0.006 (-0.15, -0.03)</td>
</tr>
<tr>
<td>BMI &lt; 20 kg/m²</td>
<td>0.66 (0.33)</td>
<td>0.81 (0.25)</td>
<td>0.002 (-0.25, -0.06)</td>
</tr>
<tr>
<td>BMI &lt; 18.5 kg/m²</td>
<td>0.57 (0.33)</td>
<td>0.80 (0.26)</td>
<td>0.003 (-0.38, -0.09)</td>
</tr>
</tbody>
</table>
Malnutrition is not an “issue”

“It’s normal to get thin as you get older”

“Why would I need to see a dietitian?”

“There’s nothing you can do about it”

“They’ll put on weight once we’ve addressed their medical problems”

“But I’m not obese…”
What next?

- Explore changes over time
- Categorise according to nutrition risk status and compare outcomes at 6 and 12 months
  - Mortality
  - Clinical status
  - Functional status
  - Quality of life
  - Use of health and social care resources
  - Health economic analysis
- Design and pilot nutritional care interventions
  - Multidisciplinary
  - Cross-boundary
  - Co-design with commissioners, staff, patients and carers
Potential interventions

- Oral nutritional supplements
- Dietary counselling
- Help with shopping, menu planning and meal preparation from paid and informal carers
- Home meal delivery services
- Lunch clubs and social eating
- Befriending services
- Cookery classes
- + exercise classes

Acknowledgements

Prof Peter Emery - King’s College London
Prof Finbarr Martin - Guy’s & St Thomas’ NHS Foundation Trust
Prof Mary Hickson - University of Plymouth
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Alice Roche - GSTT
Katherine Kimber - KCL
Plymouth students
Elderly Care teams
Any questions?