



BAPEN

Advancing Clinical Nutrition

www.bapen.org.uk

Registered Charity 1023927

‘Malnutrition Universal Screening Tool’ Frequently Asked Questions

Development and validation of the ‘MUST’

1. In which healthcare settings was ‘MUST’ piloted?

The reliability of ‘MUST’ was established by assessing extent to which the malnutrition risk obtained independently by different healthcare workers on the same group of patients agreed with each other (inter-rater agreement). A series of studies were undertaken in medical and surgical wards, outpatient clinics, nursing / residential homes and a GP surgery. Agreement was >95% in all studies. Most other screening tools have not been tested in this way and where they have, the level of agreement has generally been lower than with the ‘MUST’.

2. Has ‘MUST’ been validated for use in subjects with learning or physical disabilities? Are the BMI cut-off values relevant for this client group?

BMI is used as a general indicator of protein energy status and recommended for this purpose by national and international organisations. Whilst some clients with learning or physical disabilities were included in the pilot phase of ‘MUST’, the tool was not specifically validated in this client group. Research is required to assess if BMI reflects the same or different body composition in those subjects with learning or physical disabilities.

3. Is ‘MUST’ suitable for use in patients with renal or liver disease?

‘MUST’ has been designed for use in all care settings by all healthcare workers. There is no reason why it cannot be used in patients with renal or liver disease,

but care should be taken when interpreting BMI and weight loss if fluid balance is disturbed (see details in the 'MUST' Report and 'MUST' Explanatory Booklet).

4. Why haven't the cut-off points for BMI used in 'MUST' been adjusted for use in the elderly?

The lower BMI cut-off points for malnutrition risk used in 'MUST' are consistent with those given in a WHO report on loss of physiological function in relation to BMI. A wide range of BMI cut-off points (<17 kg/m² to <24kg/m²) have been used to indicate malnutrition in older subjects. Use of these results in enormous differences in the prevalence of malnutrition in this population group and in the strategies and resources required to manage it.

Confusion appears to have arisen from the inappropriate extrapolation of BMI cut-off values obtained from public health initiatives to clinical practice. BMI cut-off values for public health are primarily intended for groups of subjects without overt disease whilst in clinical practice they are intended for those subjects with disease.

In public health, BMI is typically used to aid the prediction and prevention of mortality, often over many years, mainly from cardiovascular disease. In clinical practice, BMI is typically used to aid the prediction of current nutritional status and body function and the likely response to treatment, usually over a much shorter time frame.

Public health and clinical approaches may not yield the same BMI values or require the same nutritional interventions.

In the UK, public health surveys have not used the elevated lower cut-off values but have consistently used BMI of < 20 kg/m² to indicate underweight in adults, including those individuals over 65 years of age. In USA, the 1990 Dietary Guidelines for Americans which suggested age specific BMI ranges were withdrawn in 1995 as it was recognised that other variables (e.g. smoking, lifestyle) affected mortality not just BMI.

In clinical practice, many professional organisations, agencies and healthcare workers recommend a BMI cut-off value of 18.5 – 20 kg/m² to identify nutritional risk in a range of ages including older subjects who account for ~50% hospital population and 90% of those in nursing homes.

The cut-off values used in 'MUST' are based on physiological and clinical observations on loss of body function as BMI decreases, the apparently normal body function in many older subjects with a BMI >20 kg/m² and randomised controlled trials showing the benefits of nutritional support in subjects, particularly those in the community with a BMI <20 kg/m².

5. How was the score of 2 for the effect of acute disease derived?

There are 2 aspects to take into account when considering the effect of acute disease on malnutrition risk. :

- (i) No or virtually no food intake for more than 5 days i.e. starvation
- (ii) The catabolic effect of acute disease.

During starvation, taller and heavier individuals tend to lose weight faster than those who are shorter and lighter. Hence men tend to lose weight faster than women. However, malnutrition risk is influenced more by the percentage weight loss than by actual weight loss. The same absolute weight loss results in a greater percentage weight loss in leaner individuals than in heavier subjects.

After 5 days of total starvation, subjects with an initial BMI of 17.5 – 18.0 kg/m² lose close to 10% body weight; those between 20 – 25 kg/m² lose about 6-8% body weight; and those with a BMI of ~ 35 kg/m² lose about 5% body weight.

In the presence of acute disease, basal metabolic rate is increased but physical activity is decreased and an increase in energy expenditure may not occur. However, there is an increase in protein oxidation and nitrogen loss, therefore in the absence of fluid retention, the rate of weight loss and loss of lean body mass tends to be more rapid in the presence of acute disease. Typically the percentage weight loss in acute disease together with no or virtually no food intake for more than 5 days is comparable to > 10% over 3 –6 months. Hence a score of 2 has been assigned.

6. What is the evidence for the equal weightings given to the 3 criteria used in 'MUST'?

Each of the 3 components of 'MUST' can occur independently or together. Each can have detrimental effects on physiological function and clinical outcome, therefore it is reasonable to assign an important weighting to all of them. The components vary in importance according to patient group, outcome variable and healthcare setting.

The predictive value of the individual components was independently assessed in a variety of healthcare specialities and settings. 'MUST' categorisation was found to be significantly related to mortality, length of stay in hospital and number of GP visits by patients in the community. The relative importance of each factor was found to vary with the care setting and type of patient (i.e. medical speciality), therefore, the MAG Committee decided to assign equal weightings to BMI, recent weight loss and acute disease effect in order to simplify use of the tool whilst retaining overall predictive validity.

7. Where can I obtain further information on the development and validation of the 'MUST'?

"The 'MUST' Report" examines the need to screen, contains the evidence base for the criteria used in 'MUST' and describes the development and validation of the 'MUST'. Copies can be purchased from the BAPEN office:

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Secure Hold Business Centre
Studley Road
Redditch
Worcester B98 7LG
Tel: 01527 457850
E-mail: bapen@sovereignconference.co.uk

8. Has 'MUST' been validated for use in children?

No. 'MUST' is only validated for use in adults.

Using the 'MUST'

1. We would like to modify 'MUST' and incorporate it into our Trust documentation. To what extent can we change 'MUST'?

- The core elements of 'MUST' should be retained and BAPEN /MAG acknowledged if 'MUST' is to be modified and incorporated into local documentation
- The tool should always be described as a nutrition screening tool and not an assessment tool
- The cut-off points and scores must not be changed
- If it is to be used in an acute hospital, all 3 steps should be included, but if it is to be used in other care settings then Step 3 (acute disease effect) may be omitted
- At least 1 alternative measurement should be included in order to calculate a height if this cannot be measured or obtained by recall. MAG would suggest ulna length
- Ideally 'MUST' BMI chart and weight loss tables should be available
- Local management guidelines can be inserted or referred to in Step 5.

2. What if a patient scores between 2 and 6?

There is currently insufficient information to make confident judgements on the severity of malnutrition in subjects with 'MUST' scores between 2 and 6. Guidance on how best to manage these patients should be obtained by undertaking a more detailed nutritional assessment in line with local policy.

3. Has the care plan given in 'MUST' been validated too?

The recommendations given in the care plan in "The 'MUST' Explanatory Booklet" are guidelines based on best practice and currently available evidence for the benefits of nutritional intervention. The guidelines can be replaced by your local guidelines / care plan.

4. Why doesn't the care plan in the 'MUST' Explanatory Booklet recommend the use of food fortification?

Potentially food fortification could be of value but there is little evidence that such modification to the diet (especially fortification with single or multiple sources of macronutrients) translates to improved clinical outcome or function.

5. How accurate are the alternative measurements suggested in 'MUST'?

It is always better to obtain an actual height or ask the subject how tall they are rather than use an alternative measurement to calculate a height. It should be possible to do this in the majority of subjects. However, if height cannot be obtained, use of any of the alternative measurements, whilst not resulting in an exact height, will provide a calculated height that is sufficiently close to the actual height to place the majority of subjects in the correct BMI band and result in a correct overall category of malnutrition risk. Ulna length is generally found to be the easiest and quickest alternative measurement to use.

6. Do I need copyright permission to reproduce 'MUST'?

- **The 'MUST'** is freely available to use *for non-commercial purposes*. If you wish to adapt the 'MUST' in any way, by adding an NHS Trust logo for example, or changing the management guidelines, copyright permission must be sought, and a copy of the adapted version sent to the BAPEN Office. 'MUST' artwork can be supplied for printing purposes.
- **If 'MUST'** is to be used *for commercial purposes*, copyright permission must be sought and a licence agreement signed & a licence fee paid before original artwork is provided by BAPEN. File copies of the materials produced must be sent back to the BAPEN Office.
- **If 'MUST'** is to be incorporated into materials for which **BAPEN endorsement** is sought, then a written proposal together with a draft of the materials to be produced must be submitted to the BAPEN Office. Two months should be allowed for this process and a fee will be charged. A copy of the BAPEN logo and a statement of endorsement will be provided for inclusion in the materials. Final [copies](#) must be sent to the BAPEN Office.
- In every instance *where 'MUST' is utilised* (in print or on-line) the following wording must also appear:
"The 'Malnutrition Universal Screening Tool' ('MUST') is reproduced here with the kind permission of BAPEN (British Association for Parenteral and

Enteral Nutrition)". An indication must be made somewhere on the documentation that for further information on 'MUST' see www.bapen.org.uk.

7. How much does the 'MUST' cost?

Copies of PDFs of the 'MUST' tool and "The 'MUST' Explanatory Booklet" can be downloaded free of charge from the BAPEN website: www.bapen.org.uk.

Additionally, printed copies of the 'MUST' tool (A5 and A4 sizes), "The 'MUST' Explanatory Booklet" and "The 'MUST' Report" can be purchased from the BAPEN office. For further information and prices contact:

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Implementing 'MUST'

1. Why is nutritional screening necessary?

Early identification of patients who are nutritionally depleted (or likely to become so) is vital in order to provide timely and appropriate nutritional intervention. Nutritional screening should result in early identification of those patients who might have otherwise have been missed.

2. Who should I screen and when?

NICE recommend screening for malnutrition and risk of malnutrition across all healthcare settings. Patients should be screened:

- on admission to hospital and weekly thereafter
- at their initial out-patient appointment
- on admission to care homes or where there is clinical concern
- at initial registration at general practice surgeries, when there is clinical concern or at other opportunities e.g. health checks, flu injections.

3. We have our own nutrition screening tool, why should we change to using 'MUST'?

If you already have a nutrition screening tool in use then there is no need to change to 'MUST' - especially if it is validated, reliable, easy and quick to use, and acceptable to patients and healthcare workers.

However, you may wish to review the evidence for the criteria used in your tool and perhaps think about comparing your tool with 'MUST'. If they identify the same subjects as being at risk of malnutrition then fine, but if not perhaps you should discuss changing to 'MUST' with your healthcare colleagues.

NICE suggest that nutritional screening should take into consideration body mass index (BMI), percentage unintentional weight loss and the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake. These parameters are the same as those in 'MUST' Steps 1-3.

4. How do I go about implementing nutritional screening?

Planning is fundamental to the successful implementation of nutritional screening in any healthcare setting. A number of steps should be considered e.g.

- Identify and secure your stakeholders - what's in it for them?
- Set up a steering group
- Identify any resources required e.g. weighing and measuring equipment
- Agree actions and timelines
- Agree care plan and management of those identified as at risk
- Agree who will deliver the training and how will it be rolled out?
- Consider how training will be delivered on an on-going basis?
- [Audit](#) and review

5. What do I do once I have screened my patients?

The results of nutritional screening should always be linked to care plans and clear goals for nutritional intervention should be set and reviewed on an ongoing basis.

Step 5 of the 'MUST' provides guidance on the management of those patients identified as being at Low, Medium or High risk of malnutrition. This step can be adapted to fit with local nutrition guidelines or policies.

The results of screening should be communicated to members of the multidisciplinary team and across healthcare settings as the patient moves between primary and secondary care.

6. Are any training resources or materials available for me to use in the UK?

A number of the Medical Nutrition companies can support you with training and resources – contact your local representative for further information.

If you have any queries relating to the practical application of 'MUST' please contact Vera Todorovic (vera.todorovic@dbh.nhs.uk) or Christine Russell (ca.russell@btinternet.com).

For further information on any other aspect of the 'MUST' please contact the BAPEN Office. Printed copies of all 'MUST' materials are available to purchase from the BAPEN office:

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