



Malnutrition Universal Screening Tool 'MUST'

How do I identify a poorly nourished patient, or a patient who is at risk of malnutrition?

Identifying a patient who is malnourished, or is at risk of malnutrition as early as possible is vital. Some of the signs and symptoms of disease related malnutrition may include:

- Unintentional weight loss
- Obvious thin/ wasted appearance
- Poor appetite/ disinterest in food reported
- History of decreased intake/poor appetite, portion sizes changed
- Altered taste/ smell
- Change in food preferences avoiding food e.g. meat
- Poor skin integrity, pressure sores

However, the most reliable method of identifying disease related malnutrition is to use a nutrition screening tool. A nutrition screening tool is only effective if the results are linked to a pathway of actions or interventions appropriate for the patients care.

There are so many nutrition screening tools available. How do I know which is best?

The main things to consider when choosing a nutrition screening tool are that it is evidence based, validated, reliable and practical. It should link to specified protocols for action e.g. referral of those identified as 'at risk', to a Dietitian for more detailed assessment or rescreen for those at low risk at regular intervals.

What screening tool is appropriate for community based adults?

Malnutrition Universal Screening Tool or MUST was developed for use in both hospital and community settings. It uses factors such as Body Mass Index (BMI), rate of weight loss and presence of acute disease factors to detect disease related malnutrition.



How to screen using 'MUST'

There are five steps to follow:

Step 1: Body mass index (BMI) (kg/m²)

- Take the subject's height and weight to calculate BMI and use the BMI chart to establish the subject's BMI score. (Appendix 2)
- If weight and height are not available, self reported height and weight, if realistic and reliable, may be appropriate.
- Height may be estimated using ulna length, knee height or demi span (www.bapen.org.uk) if the reported height is unreliable.

$$\text{Body mass Index (BMI)} = \frac{\text{weight (kg)}}{\text{Height (m)} \times \text{Height (m)}}$$

e.g.

$$\text{Weight} = 62\text{kgs} \quad \text{Height} = 1.72\text{m} \quad \text{BMI} = 62 / (1.72)^2 = 20.95\text{kgs/m}^2$$

Step 2: Unplanned weight loss

- Unplanned weight loss over 3 to 6 months is a more acute risk factor for malnutrition than BMI
 - < 5% weight loss = within normal variation (score 0)
 - 5-10% weight loss = early indicator of increased risk (score 1)
 - >10% weight loss = clinically significant (Score 2)
- To establish the subject's weight loss score, ask if there has been any weight loss in the last 3 to 6 months, and if so how much (or look in their records).
- Deduct current weight from previous weight to calculate amount of weight lost. Use weight loss tables (Appendix 3) to establish weight loss score.
- If the subject has not lost weight (or has gained weight) in the past 3 to 6 months, score = 0.

$$\text{Percentage weight loss} = \frac{\text{usual weight} - \text{current weight}}{\text{usual weight}} \times 100$$

e.g.

$$\text{Usual Weight} = 70\text{kgs}, \text{ Current wt} = 64\text{kgs} \Rightarrow (70-64)/70 \times 100 = 8.57\% \text{ Wt loss}$$



Step 3: Acute disease can affect risk of malnutrition

If the patient is currently affected by an acute patho-physiological or psychological condition, and there has been no nutritional intake for 5 or more days, they are at nutritional risk. Such patients include those who are critically ill, have swallowing difficulties (e.g. after stroke), post head injuries or are undergoing gastrointestinal surgery. Add a score of 2 for these patients.

Step 4: Overall risk of malnutrition

Establish overall risk of malnutrition after considering all relevant factors. Add scores together from Steps 1, 2 and 3 to calculate overall risk of malnutrition.

0 = Low risk

1 = Medium risk

2 or more = High risk

If neither BMI nor weight loss can be established, assess overall risk subjectively using the "Other criteria" in the box below.

Step 5: Management guidelines – setting an appropriate care plan

- Record subject's overall risk score, agree and document a care plan and any advice given.
- Subjects in high or medium risk categories typically require nutrition intervention. This intervention may include high protein high calorie dietary advice, and referral to a dietitian for a more detailed dietary assessment.

For further advice:

See The 'MUST' Explanatory Booklet for more details and The 'MUST' Report for supporting evidence. www.bapen.org.uk

For a more detailed look at high calorie dietary advice see www.indi.ie for the following fact sheets on;

- Advice for people with poor appetite / weight loss – Food Fortification
- Nutrition in Residential Care Settings Feb 2009
- A guide to the use of Oral Nutritional Supplements



MUST Malnutrition Universal Screening Tool

Step 1 BMI kg/m ²		Score
> 30 (obese) 18.5 – 20 < 18.5	0 0 1 2	_____
Step 2 Unplanned weight loss in past 3-6 months %		
< 5% 5-10% >10%	0 1 2	_____
Step 3 Acute disease effect score		
If patient is acutely ill <u>and</u> there has been or is unlikely to be no nutritional intake for > 5 days	2	_____
Step 4		
Add steps 1, 2 + 3		_____

Score 0
Low Risk

Routine clinical care

Score 1
Medium Risk

Observe

Score 2 or more
High Risk

Develop treatment pathway

Refer to National Institute for Health and Clinical Excellence (NICE) and European Society of Parenteral and Enteral Nutrition (ESPEN) Guidelines



Appendix 1

Step 1 BMI score

BMI kg/m ²	Score
>20 (>30 Obese)	= 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

If unable to obtain height and weight, see reverse for alternative measurements and use of subjective criteria

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 Homes – 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 concern - follow local policy
- Repeat screening
Hospital – weekly
Care Home – at least monthly
Community – at least every 2-3 months

2 or more High Risk Treat*

- Refer to dietician, 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.

Re-assess subjects identified at risk as they move through care settings

See The 'MUST' Explanatory Booklet for further details and The 'MUST' Report for supporting evidence.



Appendix 2

Step 1 – BMI score (& BMI)

Height (feet and inches)

	4'10 ^{1/2}	4'11	5'0	5'0 ^{1/2}	5'1 ^{1/2}	5'2	5'3	5'4	5'4 ^{1/2}	5'5 ^{1/2}	5'6	5'7	5'7 ^{1/2}	5'8 ^{1/2}	5'9 ^{1/2}	5'10	5'11	5'11 ^{1/2}	6'0 ^{1/2}	6'1	6'2	6'3	
100	46	44	43	42	41	40	39	38	37	36	35	35	34	33	32	32	31	30	30	29	28	28	15 10
99	45	44	43	42	41	40	39	38	37	36	35	34	33	33	32	31	31	30	29	29	28	27	15 8
98	45	44	42	41	40	39	38	37	36	35	34	33	32	32	31	30	30	29	28	28	27	27	15 6
97	44	43	42	41	40	39	38	37	36	35	34	34	33	32	31	31	30	29	29	28	27	27	15 4
96	44	43	42	40	39	38	38	37	36	35	34	33	32	32	31	30	30	29	28	28	27	27	15 2
95	43	42	41	40	39	38	37	36	35	34	34	33	32	31	31	30	29	29	28	27	27	26	15 0
94	43	42	41	40	39	38	37	36	35	34	33	33	32	31	30	30	29	28	28	27	27	26	14 11
93	42	41	40	39	38	37	36	35	35	34	33	32	31	31	30	29	29	28	27	27	26	26	14 9
92	42	41	40	39	38	37	36	35	34	33	33	32	31	30	30	29	28	28	27	27	26	25	14 7
91	42	40	39	38	37	36	36	35	34	33	32	31	31	30	29	29	28	27	27	26	26	25	14 5
90	41	40	39	38	37	36	35	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	14 2
89	41	40	39	38	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	25	14 0
88	40	39	38	37	36	35	34	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	13 12
87	40	39	38	37	36	35	34	33	32	31	30	29	29	28	27	27	26	26	25	25	24	24	13 10
86	39	38	37	36	35	34	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	24	13 8
85	39	38	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	25	24	24	13 6
84	38	37	36	35	35	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	24	23	13 3
83	38	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	25	24	24	23	13 1
82	37	36	35	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	12 13
81	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	24	24	23	23	22	12 11
80	37	36	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	22	12 8
79	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	24	24	23	23	22	22	12 6
78	36	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	22	22	12 4
77	35	34	33	32	32	31	30	29	29	28	27	27	26	25	25	24	24	23	23	22	22	21	12 1
76	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	22	22	21	21	11 13
75	34	33	32	32	31	30	29	29	28	27	27	26	25	25	24	24	23	23	22	22	21	21	11 11
74	34	33	32	31	30	30	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	11 9
73	33	32	32	31	30	29	29	28	27	26	26	25	25	24	24	23	23	22	22	21	21	20	11 7
72	33	32	31	30	30	29	28	27	27	26	26	25	24	24	23	23	22	22	21	21	20	20	11 4
71	32	32	31	30	29	28	28	27	26	26	25	25	24	23	23	22	22	21	21	21	20	20	11 3
70	32	31	30	30	29	28	27	27	26	25	25	24	24	23	23	22	22	21	21	20	20	19	11 0
69	32	31	30	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	10 11
68	31	30	29	29	28	27	27	26	25	25	24	24	23	22	22	21	21	21	20	20	19	19	10 10
67	31	30	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	10 7
66	30	29	28	27	26	26	25	25	24	23	23	22	22	21	21	20	20	19	19	18	18	17	10 6
65	30	29	28	27	26	25	25	24	24	23	22	22	21	21	21	20	20	19	19	18	18	17	10 3
64	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	18	17	10 1
63	29	28	27	26	25	25	24	23	23	22	22	21	21	20	20	19	19	19	18	18	17	17	9 13
62	28	28	27	26	25	24	24	23	22	22	21	21	20	20	20	19	19	18	18	17	17	16	9 10
61	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	18	17	17	16	9 8
60	27	27	26	25	25	24	23	22	22	21	21	20	20	19	19	18	18	18	17	17	17	16	9 6
59	27	26	26	25	24	24	23	22	22	21	21	20	20	19	19	18	18	17	17	17	16	16	9 4
58	26	26	25	24	24	23	23	22	22	21	21	20	20	19	18	18	17	17	16	16	16	15	9 1
57	26	25	25	24	23	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	9 0
56	26	25	24	24	23	22	22	21	21	20	20	19	19	18	18	17	17	17	16	16	16	15	8 11
55	25	24	24	23	23	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	14	8 8
54	25	24	23	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	14	8 7
53	24	24	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	8 4
52	24	23	23	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	8 3
51	23	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	8 0
50	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	7 13
49	22	22	21	21	20	20	19	19	18	18	17	17	16	16	15	15	15	14	14	14	14	14	7 10
48	22	21	21	20	20	19	19	18	18	17	17	16	16	15	15	15	14	14	14	14	13	13	7 7
47	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	7 6
46	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	13	7 3
45	21	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	13	12	7 1
44	20	20	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	6 13
43	20	19	19	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	6 11
42	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	6 8
41	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	11	6 6
40	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	11	11	6 4
39	18	17	17	16	16	16	15	15	15	14	14	13	13	13	13	12	12	12	12	11	11	11	6 1
38	17	17	16	16	16	15	15	14	14	14	13	13	13	13	12	12	12	11	11	11	11	11	6 0
37	17	16	16	16	15	15	14	14	14	13	13	13	13	12	12	12	11	11	11	11	10	10	5 11
36	16	16	16	15	15	14	14	14	13	13	13	12	12	12	12	11	11	11	10	10	10	10	5 9
35	16	15	15	15	14	14	14	13	13	13	12	12	12	12	11	11	11	11	10	10	10	10	5 7
34	16	15	15	14	14	14	13	13	13	12	12	12	11	11	11	11	10	10	10	10	10	10	5 5

Height (m)

Note : The black lines denote the exact cut off points (



Appendix 3

Step 2 – Weight loss score

	SCORE 0 Wt Loss < 5%	SCORE 1 Wt Loss 5-10%	SCORE 2 Wt Loss > 10%
34 kg	<1.70	1.70 – 3.40	>3.40
36 kg	<1.80	1.80 – 3.60	>3.60
38 kg	<1.90	1.90 – 3.80	>3.80
40 kg	<2.00	2.00 – 4.00	>4.00
42 kg	<2.10	2.10 – 4.20	>4.20
44 kg	<2.20	2.20 – 4.40	>4.40
46 kg	<2.30	2.30 – 4.60	>4.60
48 kg	<2.40	2.40 – 4.80	>4.80
50 kg	<2.50	2.50 – 5.00	>5.00
52 kg	<2.60	2.60 – 5.20	>5.20
54 kg	<2.70	2.70 – 5.40	>5.40
56 kg	<2.80	2.80 – 5.60	>5.60
58 kg	<2.90	2.90 – 5.80	>5.80
60 kg	<3.00	3.00 – 6.00	>6.00
62 kg	<3.10	3.10 – 6.20	>6.20
64 kg	<3.20	3.20 – 6.40	>6.40
66 kg	<3.30	3.30 – 6.60	>6.60
68 kg	<3.40	3.40 – 6.80	>6.80
70 kg	<3.50	3.50 – 7.00	>7.00
72 kg	<3.60	3.60 – 7.20	>7.20
74 kg	<3.70	3.70 – 7.40	>7.40
76 kg	<3.80	3.80 – 7.60	>7.60
78 kg	<3.90	3.90 – 7.80	>7.80
80 kg	<4.00	4.00 – 8.00	>8.00
82 kg	<4.10	4.10 – 8.20	>8.20
84 kg	<4.20	4.20 – 8.40	>8.40
86 kg	<4.30	4.30 – 8.60	>8.60
88 kg	<4.40	4.40 – 8.80	>8.80
90 kg	<4.50	4.50 – 9.00	>9.00
92 kg	<4.60	4.60 – 9.20	>9.20
94 kg	<4.70	4.70 – 9.40	>9.40
96 kg	<4.80	4.80 – 9.60	>9.60
98 kg	<4.90	4.90 – 9.80	>9.80
100 kg	<5.00	5.00 – 10.00	>10.00
102 kg	<5.10	5.10 – 10.20	>10.20
104 kg	<5.20	5.20 – 10.40	>10.40
106 kg	<5.30	5.30 – 10.60	>10.60
108 kg	<5.40	5.40 – 10.80	>10.80
110 kg	<5.50	5.50 – 11.00	>11.00
112 kg	<5.60	5.60 – 11.20	>11.20
114 kg	<5.70	5.70 – 11.40	>11.40
116 kg	<5.80	5.80 – 11.60	>11.60
118 kg	<5.90	5.90 – 11.80	>11.80
120 kg	<6.00	6.00 – 12.00	>12.00
122 kg	<6.10	6.10 – 12.20	>12.20
124 kg	<6.20	6.20 – 12.40	>12.40
126 kg	<6.30	6.30 – 12.60	>12.60

Weight before weight loss (kg)

	SCORE 0 Wt Loss < 5%	SCORE 1 Wt Loss 5-10%	SCORE 2 Wt Loss > 10%
5st 4lb	<4lb	4lb – 7lb	>7lb
5st 7lb	<4lb	4lb – 8lb	>8lb
5st 11lb	<4lb	4lb – 8lb	>8lb
6st	<4lb	4lb – 8lb	>8lb
6st 4lb	<4lb	4lb – 9lb	>9lb
6st 7lb	<5lb	5lb – 9lb	>9lb
6st 11lb	<5lb	5lb – 10lb	>10lb
7st	<5lb	5lb – 10lb	>10lb
7st 4lb	<5lb	5lb – 10lb	>10lb
7st 7lb	<5lb	5lb – 11lb	>11lb
7st 11lb	<5lb	5lb – 11lb	>11lb
8st	<6lb	6lb – 11lb	>11lb
8st 4lb	<6lb	6lb – 12lb	>12lb
8st 7lb	<6lb	6lb – 12lb	>12lb
8st 11lb	<6lb	6lb – 12lb	>12lb
9st	<6lb	6lb – 13lb	>13lb
9st 4lb	<7lb	7lb – 13lb	>13lb
9st 7lb	<7lb	7lb – 13lb	>13lb
9st 11lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st	<7lb	7lb – 1st 0lb	>1st 0lb
10st 4lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st 7lb	<7lb	7lb – 1st 1lb	>1st 1lb
10st 11lb	<8lb	8lb – 1st 1lb	>1st 1lb
11st	<8lb	8lb – 1st 1lb	>1st 1lb
11st 4lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 7lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 11lb	<8lb	8lb – 1st 3lb	>1st 3lb
12st	<8lb	8lb – 1st 3lb	>1st 3lb
12st 4lb	<9lb	9lb – 1st 3lb	>1st 3lb
12st 7lb	<9lb	9lb – 1st 4lb	>1st 4lb
12st 11lb	<9lb	9lb – 1st 4lb	>1st 4lb
13st	<9lb	9lb – 1st 4lb	>1st 4lb
13st 4lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 7lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 11lb	<10lb	10lb – 1st 5lb	>1st 5lb
14st	<10lb	10lb – 1st 6lb	>1st 6lb
14st 4lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 7lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 11lb	<10lb	10lb – 1st 7lb	>1st 7lb
15st	<11lb	11lb – 1st 7lb	>1st 7lb
15st 4lb	<11lb	11lb – 1st 7lb	>1st 7lb
15st 7lb	<11lb	11lb – 1st 8lb	>1st 8lb
15st 11lb	<11lb	11lb – 1st 8lb	>1st 8lb
16st	<11lb	11lb – 1st 8lb	>1st 8lb
16st 4lb	<11lb	11lb – 1st 9lb	>1st 9lb
16st 7lb	<12lb	12lb – 1st 9lb	>1st 9lb

Weight before weight loss (st lb)

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