

Acute Training Solutions

Malnutrition Universal Screening Tool

Must

'MUST' is a five-step screening tool to identify adults, who are malnourished, at risk of malnutrition (undernutrition), or obese. It also includes management guidelines which can be used to develop a care plan.

It is for use in hospitals, community and other care settings and can be used by all care workers.

This guide contains:

- A flow chart showing the 5 steps to use for screening and management
- BMI chart
- Weight loss tables
- Alternative measurements when BMI cannot be obtained by measuring weight and height.

The Five 'Must' Steps

Step 1	Measure height and weight to get a BMI score using chart provided. If unable to obtain height and weight, use the alternative procedures shown in this guide.
Step 2	Note percentage unplanned weight loss and score using tables provided.
Step 3	Establish acute disease effect and score.
Step 4	Add scores from steps 1, 2 and 3 together to obtain overall risk of malnutrition.
Step 5	Use management guidelines and/or local policy to develop care plan.

Please refer to The 'MUST' Explanatory Booklet for more information when weight and height cannot be measured, and when screening patient groups in which extra care in interpretation is needed (e.g. those with fluid disturbances, plaster casts, amputations, critical illness and pregnant or lactating women). The booklet can also be used for training. See The 'MUST' Report for supporting evidence. Please note that 'MUST' has not been designed to detect deficiencies or excessive intakes of vitamins and minerals and is of use only in adults.

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

Acute disease effect is unlikely to apply outside hospital. See 'MUST' Explanatory Booklet for further information

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 adequate – little concern and repeat screening
 - Hospital – weekly
 - Care Home – at least monthly
 - Community – at least every 2-3 months
- If inadequate – clinical concern – follow local policy, set goals, improve and increase overall nutritional intake, monitor and review care plan regularly

2 or more High Risk
Treat*

- Refer to dietitian, Nutritional Support Team or implement local policy
- Set goals, 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.



Step 1 - BMI Score

	1.38	1.42	1.46	1.50	1.54	1.58	1.62	1.66	1.70	1.74	1.78	1.82	1.86	1.90	1.94	1.98	
150	79	74	70	67	63	60	57	54	52	50	47	45	43	42	40	38	23s 8
148	78	73	68	66	62	58	56	54	51	48	47	45	43	41	39	38	23s 3
146	77	72	68	65	62	58	56	53	51	48	46	44	42	40	39	37	22s 13
144	76	71	68	64	61	58	55	52	50	48	45	43	42	40	38	37	22s 9
142	75	70	67	63	60	57	54	52	49	47	45	43	41	39	38	36	22s 4
140	74	69	66	62	59	56	53	51	48	46	44	42	40	38	37	36	22s
138	72	68	65	61	58	55	53	50	48	46	44	42	40	38	37	35	21s 10
136	71	67	64	60	57	54	52	49	47	45	43	41	38	38	36	35	21s 5
134	70	68	63	60	57	54	51	49	45	44	42	40	38	37	36	34	21s 1
132	69	65	62	59	56	55	50	48	46	44	42	40	38	37	36	34	20s 10
130	68	64	61	58	55	52	50	47	45	43	41	39	38	36	35	33	20s 6
128	67	63	60	57	54	51	49	46	44	42	40	39	37	35	34	33	20s 2
126	66	62	59	56	53	50	48	46	44	42	40	38	36	35	34	32	19s 12
124	65	61	58	55	52	50	47	45	43	41	39	37	35	34	33	32	19s 7
122	64	61	57	54	51	49	46	44	42	40	39	37	35	34	32	31	19s 3
120	63	60	58	53	51	48	46	44	42	40	38	36	35	33	32	31	18s 13
118	62	59	55	52	50	47	45	43	41	39	37	36	34	33	31	30	18s 8
116	61	58	54	52	49	46	44	42	40	38	37	35	34	32	31	30	18s 4
114	60	57	53	51	48	46	43	41	39	38	36	34	33	32	30	29	17s 13
112	59	56	53	50	47	45	43	41	39	37	35	34	32	31	30	29	17s 9
110	58	55	52	49	46	44	42	40	38	36	35	33	32	30	29	28	17s 5
108	57	54	51	48	45	43	41	39	37	36	34	33	31	30	29	28	17s
106	56	53	50	47	45	42	40	38	37	35	33	32	31	29	28	27	16s 10
104	55	52	49	46	44	42	40	38	36	34	33	31	30	29	28	27	16s 5
102	54	51	48	45	43	41	39	37	35	34	32	31	29	28	27	26	16s 1
100	53	50	47	44	42	40	38	36	35	33	32	30	29	28	27	26	15s 10
98	51	49	46	44	41	39	37	36	34	32	31	30	28	27	26	25	15s 6
96	50	48	45	43	40	38	37	35	33	32	30	29	28	27	26	24	15s 2
94	49	47	44	42	40	38	36	34	33	31	30	28	27	26	25	24	14s 11
92	48	46	43	41	39	37	35	33	32	30	29	28	27	25	24	23	14s 7
90	47	45	42	40	38	36	34	33	31	30	28	27	26	25	24	23	14s 2
88	46	44	41	39	37	35	34	32	30	29	28	27	25	24	23	22	13s 12
86	45	43	40	38	36	34	33	31	30	28	27	26	25	24	23	22	13s 8
84	44	42	39	37	35	34	32	30	29	28	27	25	24	23	22	21	13s 3
82	43	41	38	36	35	33	31	30	28	27	26	25	24	23	22	21	12s 13
80	42	40	38	36	34	32	30	28	28	26	25	24	23	22	21	20	12s 8
78	41	38	37	35	33	31	30	28	27	26	25	24	23	22	21	20	12s 4
76	40	38	36	34	32	30	29	28	26	25	24	23	22	21	20	19	12s
74	39	37	35	33	31	30	28	27	25	24	23	22	21	20	20	19	11s 9
72	38	36	34	32	30	29	27	26	25	24	23	22	21	20	19	18	11s 5
70	37	35	33	31	30	28	27	25	24	23	22	21	20	19	19	18	11s
68	36	34	32	30	29	27	26	25	24	22	21	21	20	19	18	17	10s 10
66	35	33	31	29	28	28	25	24	23	22	21	20	19	18	18	17	10s 6
64	34	32	30	28	27	26	24	23	22	21	20	19	18	18	17	16	10s 1
62	33	31	29	28	26	25	24	22	21	20	20	19	18	17	16	16	9s 11
60	32	30	28	27	25	24	24	22	21	20	19	18	17	17	16	15	9s 6
58	30	29	27	26	24	23	22	21	20	19	18	18	17	16	15	15	9s 2
56	29	28	26	25	24	22	21	20	19	18	18	17	16	16	15	14	8s 11
54	28	27	25	24	23	22	21	20	19	17	17	16	16	15	14	14	8s 7
52	27	26	24	23	22	21	20	19	18	17	16	15	15	14	14	13	8s 3
50	26	25	23	22	21	20	19	18	17	17	16	15	14	14	13	13	7s 12
48	25	24	23	21	20	19	18	17	17	16	15	14	14	13	13	12	7s 8
46	24	23	22	20	19	18	18	17	16	15	15	14	13	13	12	12	7s 3
44	23	22	21	20	19	18	17	16	15	15	14	13	13	12	12	11	6s 13
42	22	21	20	19	18	17	16	15	15	14	13	13	12	12	11	11	6s 9
40	21	20	19	18	17	16	15	15	14	13	13	12	12	11	10	10	6s 4
38	20	19	18	17	16	15	14	14	13	13	12	11	11	11	10	10	6s
36	19	18	17	16	15	14	14	13	12	11	11	10	10	9	9	9	5s 9
	4'6"	4'8"	4'9"	4'11"	5'	5'2"	5'4"	5'5"	5'7"	5'8"	5'10"	5'11"	6'1"	6'3"	6'4"		

Step 2 - Weight Loss Score

Score 0 Wt loss < 5%	Score 1 Wt loss 5 - 10%	Score 2 Wt loss > 10%
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Weight loss in last 3 to 6 months

kg	Weight loss in last 3 to 6 months		
	Less than (kg)	Between (kg)	More than (kg)
30	1.6	1.6 - 3.3	3.3
31	1.6	1.6 - 3.4	3.4
32	1.7	1.7 - 3.6	3.6
33	1.7	1.7 - 3.7	3.7
34	1.8	1.8 - 3.8	3.8
35	1.8	1.8 - 3.9	3.9
36	1.9	1.9 - 4.0	4.0
37	1.9	1.9 - 4.1	4.1
38	2.0	2.0 - 4.2	4.2
39	2.1	2.1 - 4.3	4.3
40	2.1	2.1 - 4.4	4.4
41	2.2	2.2 - 4.6	4.6
42	2.2	2.2 - 4.7	4.7
43	2.3	2.3 - 4.8	4.8
44	2.3	2.3 - 4.9	4.9
45	2.4	2.4 - 5.0	5.0
46	2.4	2.4 - 5.1	5.1
47	2.5	2.5 - 5.2	5.2
48	2.5	2.5 - 5.3	5.3
49	2.6	2.6 - 5.4	5.4
50	2.6	2.6 - 5.6	5.6
51	2.7	2.7 - 5.5	5.7
52	2.7	2.7 - 5.8	5.8
53	2.8	2.8 - 5.9	5.9
54	2.8	2.8 - 6.9	6.0
55	2.9	2.9 - 6.1	6.1
56	2.9	2.9 - 6.2	6.2
57	3.0	3.0 - 6.3	6.3
58	3.1	3.1 - 6.4	6.4
59	3.1	3.1 - 6.6	6.6
60	3.2	3.2 - 6.7	6.7
61	3.2	3.2 - 6.8	6.8
62	3.3	3.3 - 6.9	6.9
63	3.3	3.3 - 7.0	7.0
64	3.4	3.4 - 7.1	7.1

Score 0 Wt loss < 5%	Score 1 Wt loss 5 - 10%	Score 2 Wt loss > 10%
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Weight loss in last 3 to 6 months

kg	Weight loss in last 3 to 6 months		
	Less than (kg)	Between (kg)	More than (kg)
65	3.4	3.4 - 7.2	7.2
66	3.5	3.5 - 7.3	7.3
67	3.5	3.5 - 7.4	7.4
68	3.6	3.6 - 7.7	7.6
69	3.6	3.6 - 7.7	7.7
70	3.7	3.7 - 7.8	7.8
71	3.7	3.7 - 7.9	7.9
72	3.8	3.8 - 8.0	8.0
73	3.8	3.8 - 8.1	8.1
74	3.9	3.9 - 8.2	8.2
75	3.9	3.9 - 8.3	8.3
76	4.0	4.0 - 8.4	8.4
77	4.1	4.1 - 8.6	8.6
78	4.1	4.1 - 8.6	8.7
79	4.2	4.2 - 8.7	8.8
80	4.2	4.2 - 8.9	8.9
81	4.3	4.3 - 9.0	9.0
82	4.3	4.3 - 9.1	9.1
83	4.4	4.4 - 9.2	9.2
84	4.4	4.4 - 9.3	9.3
85	4.5	4.5 - 9.4	9.4
86	4.5	4.5 - 9.6	9.6
87	4.6	4.6 - 9.7	9.7
88	4.6	4.6 - 9.8	9.8
89	4.7	4.7 - 9.9	9.9
90	4.7	4.7 - 10.0	10.0
91	4.8	4.8 - 10.1	10.1
92	4.8	4.8 - 10.2	10.2
93	4.9	4.9 - 10.3	10.3
94	4.9	4.9 - 10.4	10.4
95	5.0	5.0 - 10.6	10.6
96	5.1	5.1 - 10.7	10.7
97	5.1	5.1 - 10.8	10.8
98	5.2	5.2 - 10.9	10.9
99	5.2	5.2 - 11.0	11.0

Alternative measurements and considerations

Step 1: BMI (body mass index)

If height cannot be measured Use recently documented or self-reported height (if reliable and realistic). If the subject does not know or is unable to report their height, use one of the alternative measurements to estimate height (ulna, knee height or demispan).

Step 2: Recent unplanned weight loss

If recent weight loss cannot be calculated, use self-reported weight loss (if reliable and realistic).

Subjective criteria

If height, weight or BMI cannot be obtained, the following criteria which relate to them can assist your professional judgement of the subject's nutritional risk category. Please note, these criteria should be used collectively not separately as alternatives to steps 1 and 2 of 'MUST' and are not designed to assign a score. Mid upper arm circumference (MUAC) may be used to estimate BMI category in order to support your overall impression of the subject's nutritional risk.

1. BMI

Clinical impression – thin, acceptable weight, overweight. Obvious wasting (very thin) and obesity (very overweight) can also be noted.

2. Unplanned weight loss

Clothes and/or jewellery have become loose fitting (weight loss). History of decreased food intake, reduced appetite or swallowing problems over 3-6 months and underlying disease or psycho-social/physical disabilities likely to cause weight loss.

3. Acute disease effect

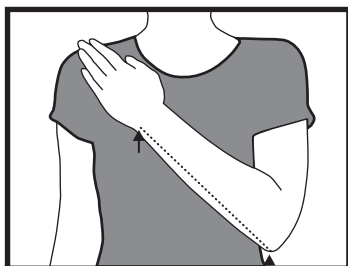
Acutely ill and no nutritional intake or likelihood of no intake for more than 5 days.

Alternative measurement: instructions and tables

If height cannot be obtained, use length of forearm (ulna) to calculate height using tables below.

(See The 'MUST' Explanatory Booklet for details of other alternative measurements (knee height and demispan) that can also be used to estimate height).

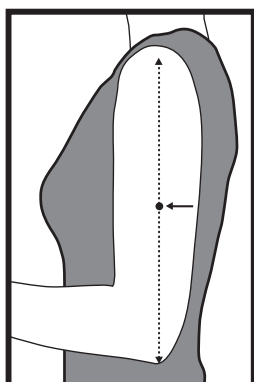
Estimating height from ulna length



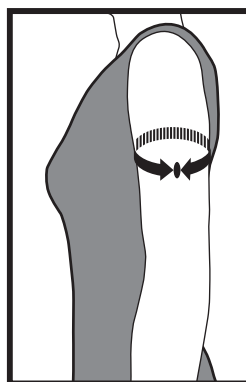
Measure between the point of the elbow (olecranon process) and the midpoint of the prominent bone of the wrist (styloid process) (left side if possible).

Height (m)	men (<65 years)	1.94	1.93	1.91	1.89	1.87	1.85	1.84	1.82	1.80	1.78	1.76	1.75	1.73	1.71
	men (≥65 years)	1.87	1.86	1.84	1.82	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.67
Ulna length (cm)		32.0	31.5	31.0	30.5	30.0	29.5	29.0	28.5	28.0	27.5	27.0	26.5	26.0	25.5
Height (m)	men (<65 years)	1.84	1.83	1.81	1.80	1.79	1.77	1.76	1.75	1.73	1.72	1.70	1.69	1.68	1.66
	men (≥65 years)	1.84	1.83	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.66	1.65	1.63
Ulna length (cm)		25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5
Height (m)	men (<65 years)	1.69	1.67	1.66	1.64	1.62	1.60	1.58	1.57	1.55	1.53	1.51	1.49	1.48	1.46
	men (≥65 years)	1.65	1.63	1.62	1.60	1.59	1.57	1.56	1.54	1.52	1.51	1.49	1.48	1.46	1.45
Ulna length (cm)		25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5
Height (m)	men (<65 years)	1.65	1.63	1.62	1.61	1.59	1.58	1.56	1.55	1.54	1.52	1.51	1.50	1.48	1.47
	men (≥65 years)	1.61	1.60	1.58	1.56	1.55	1.53	1.52	1.50	1.48	1.47	1.45	1.44	1.42	1.40

Estimating BMI category from mid upper arm circumference (MUAC)



The subject's left arm should be bent at the elbow at a 90 degree angle, with the upper arm held parallel to the side of the body. Measure the distance between the bony protrusion on the shoulder (acromion) and the point of the elbow (olecranon process). Mark the mid-point.



Ask the subject to let arm hang loose and measure around the upper arm at the mid-point, making sure that the tape measure is snug but not tight.

If MUAC is <23.5 cm, BMI is likely to be <20 kg/m².

If MUAC is >32.0 cm, BMI is likely to be >30 kg/m².