FRESENIUS KABI
caring for life

Good nutrition practice

4 steps: screening, assessment, nutrition therapy, monitoring

4 steps

gnp good® nutrition practice by Fresenius Kabi

Hospital

Your steps to good nutrition practice

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Step 1 — Screening
within 24 hours of admission

High Risk

Moderate Risk

Low Risk

Step 2 — Assessment

- Causes of malnutrition
- Evaluation of relevant parameters
- Assessment of the nutritional intake

Step 3 — Nutrition therapy

- Define the nutritional goals and the individual nutritional requirements
- Define the route(s) of nutrition
- Define nutritional support and implement the nutritional therapy plan

Step 4 — Monitoring / Follow-up

- Documentation and monitoring of the effectiveness of the nutrition therapy
- Adaptation of the nutrition therapy plan if necessary

Re-Screening
weekly

Calculation of Body Mass Index (BMI = kg/m²)

Weight (kg) / Height (m)

Height (m)	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90
2.10	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	14	14	15	15	15	16	16	17	17	18	18.1	18.6	19	19.5	20.0	20.4
2.08	7	7	8	8	9	9	10	10	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17	18	18.0	18.5	19	19	19.9	20.3	20.8
2.06	7	8	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	16	17	17	18	18.4	18.9	19	19.8	20.3	20.7	21
2.04	7	8	8	9	9	10	10	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17	18	18.3	18.7	19	19.7	20.2	20.7	21	22
2.02	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18.1	18.6	19	19.6	20.1	20.6	21	22	22
2.00	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18.0	18.5	19	19.5	20.0	20.5	21	22	22	23
1.98	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18.4	18.9	19	19.9	20.4	20.9	21	22	22	23
1.96	8	8	9	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	18.2	18.7	19	19.8	20.3	20.8	21	22	22	23	23
1.94	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	18	18.1	18.6	19	19.7	20.2	20.7	21	22	22	23	23	24
1.92	8	9	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	18.4	19.0	19.5	20.1	20.6	21	22	22	23	23	24	24.4
1.90	8	9	9	10	11	11	12	12	13	13	14	14	15	16	16	17	17	18	18.3	18.8	19	19.9	20.5	21	22	22	23	23	24	24	24.9
1.88	8	9	10	10	11	11	12	12	13	14	14	15	15	16	16	17	18	18.1	18.7	19	19.8	20.4	20.9	22	22	23	23	24	24	24.9	25.5
1.86	9	9	10	10	11	12	12	13	13	14	14	15	16	16	17	17	17.9	18.5	19	19.7	20.2	20.8	21	22	23	23	24	24	24.9	25.4	26
1.84	9	9	10	11	11	12	12	13	14	14	15	15	16	17	17	18	18.3	18.9	19.5	20.1	20.7	21	22	22	23	24	24	24.8	25.4	26	27
1.82	9	10	10	11	11	12	13	13	14	14	15	16	16	17	18	18.1	18.7	19	19.9	20.5	21	22	22	23	24	24	24.8	25.4	26	27	27
1.80	9	10	10	11	12	12	13	14	14	15	15	16	17	17	17.9	18.5	19	19.8	20.4	21.0	22	22	23	23	24	24.7	25.3	26	27	27	28
1.78	9	10	11	11	12	13	13	14	15	15	16	16	17	18	18.3	18.9	19.6	20.2	20.8	21	22	23	23	24	24.6	25.2	26	27	27	28	28
1.76	10	10	11	12	12	13	14	14	15	15	16	17	17	18.1	18.7	19.4	20.0	20.7	21	22	23	23	24	24.5	25.2	26	26	27	28	28	29
1.74	10	11	11	12	13	13	14	15	15	16	17	17	17.8	18.5	19	19.8	20.5	21	22	22	23	24	24.4	25.1	26	26	27	28	28	29	29.7
1.72	10	11	11	12	13	14	14	15	16	16	17	18	18.3	18.9	19.6	20.3	21.0	22	22	23	24	24.3	25.0	26	26	27	28	28	29	29.7	30.4
1.70	10	11	12	12	13	14	15	15	16	17	17	18.0	18.7	19.4	20.1	20.8	21	22	23	24	24	24.9	25.6	26	27	28	28	29	29.8	30.4	31
1.68	11	11	12	13	13	14	15	16	16	17	18	18.4	19.1	19.8	20.5	21	22	23	23	24	24.8	25.5	26	27	28	28	29	29.8	30.5	31	32
1.66	11	12	12	13	14	15	15	16	17	17	18.1	18.9	19.6	20.3	21.0	22	22	23	24	24.7	25.4	26	27	28	28	29	29.8	30.5	31	32	33
1.64	11	12	13	13	14	15	16	16	17	17.8	18.6	19.3	20.1	20.8	22	22	23	24	24.5	25.3	26	27	28	28	29	29.7	30.5	31	32	33	33
1.62	11	12	13	14	14	15	16	17	18	18.3	19.1	19.8	20.6	21	22	23	24	24.4	25.1	26	27	27	28	29	29.7	30.5	31	32	33	34	34.3
1.60	12	13	13	14	15	16	16	17	18.0	18.8	19.5	20.3	21.1	22	23	23	24.2	25.0	26	27	27	28	29	29.7	30.5	31	32	33	34	34.4	35.2
1.58	12	13	14	14	15	16	17	18	18.4	19.2	20.0	20.8	22	22	23	24	24.8	25.6	26	27	28	29	29.6	30.4	31	32	33	34	34.4	35.3	36
1.56	12	13	14	15	16	16	17	18.1	18.9	19.7	20.5	21	22	23	24	24.7	25.5	26	27	28	29	29.6	30.4	31	32	33	34	34.5	35.3	36	37
1.54	13	13	14	15	16	17	17.7	18.6	19.4	20.2	21.1	22	23	24	24.5	25.3	26	27	28	29	29.5	30.4	31	32	33	34	34.6	35.4	36	37	38
1.52	13	14	15	16	16	17	18.2	19.0	19.9	20.8	22	23	23	24.2	25.1	26	27	28	29	29.4	30.3	31	32	33	34	34.6	35.5	36	37	38	39
1.50	13	14	15	16	17	17.8	18.7	19.6	20.4	21.3	22	23	24	24.9	25.8	27	28	28	29.3	30.2	31	32	33	34	34.7	35.6	36	37	38	39.1	40.0
1.48	14	15	16	16	17	18.3	19.2	20.1	21.0	22	23	24	24.7	25.6	26	27	28	29.2	30.1	31	32	33	34	34.7	35.6	37	37	38	39.3	40.2	41
1.46	14	15	16	17	17.8	18.8	19.7	20.6	22	23	23	24.4	25.3	26	27	28	29.1	30.0	31	32	33	34	34.7	35.7	37	38	38	39.4	40.3	41	42
1.44	14	15	16	17	18.3	19.3	20.3	21.2	22	23	24.1	25.1	26	27	28	29	29.9	30.9	32	33	34	34.7	35.7	37	38	39	39.5	40.5	41	42	43

< 18.5	18.5–19.9	20–24.9	25–29.9	30–34.9	35–39.9	≥ 40	< 20.5
Severely underweight	Under-weight	Normal weight	Pre-obesity	Obese Class I	Obese Class II	Obese Class III	Increased risk of malnutrition

Desirable BMI values

Age (years)	BMI (kg/m²)
19 - 24	19 - 24
25 - 34	20 - 25
35 - 44	21 - 26
45 - 54	22 - 27
55 - 64	23 - 28
≥ 65	24 - 29

Ask your Fresenius Kabi contact person for the gnp knee height calculator for a quick and easy performance.

Source:
adapted from WHO 1995, WHO 2000, WHO 2001

Estimating Body Mass Index from mid upper arm circumference (MUAC):

If the BMI cannot be determined (e.g. due to oedemas, contractures, amputations), the circumference of the middle upper arm can be measured as an alternative.

- Allow arm to hang loosely
- Feel out the small hollow at the attachment of the upper arm to the shoulder (between collarbone and upper arm bone)
- Bend arm by 90°, with palm facing upward (Fig. 1)
- Measure length from the located hollow to the elbow (rearmost part of the elbow)
- Mark middle of upper arm (half of the measured length)
- Allow arm to hang down again
- At the mark, measure the circumference of the arm with a tape measure (do not pull to tightly) (Fig. 2)

Fig. 1

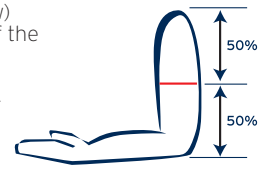

Fig. 2

MUAC < 25 cm corresponds to BMI < 20.5 kg/m²

Calculation of Weight loss in %

Normal weight [kg]	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	Weight loss [%]
Current weight [kg]	38	43	47.5	52	57	62	66.5	71	76	81	85.5	90	95	100	104.5	109	5%
	36	40.5	45	49.5	54	58.5	63	67.5	72	76.5	81	85.5	90	94.5	99	103.5	10%
	34	38	42.5	47	51	55	59.5	64	68	72	76.5	81	85	89	93.5	98	15%

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Patient name	Date of birth	Date of admission	Date of screening	Normal weight (kg)	Current weight (kg)	Height (m)	BMI (kg/m²)

Step 1 Screening[1]

! Within 24 hours of admission. Takes less than 5 minutes.

Initial Screening

Is the Body Mass Index (BMI) < 20.5 kg/m²? ▸ Actual BMI:	YES	NO
Has weight loss occurred during the last 3 months? ▸ .....% weight loss over .....month(s)	YES	NO
Has food intake declined over the last week?	YES	NO
Is a major illness involved? ▸ Details:	YES	NO

If the answer is **"Yes"** to at least one question, the "Final Screening" needs to be performed.
If the answer is **"No"** to all questions, the patient needs to be re-screened at weekly intervals.

Final Screening

Impaired nutritional status	Score	Score	Severity of disease
– Normal nutritional status	0	0	Low
– Weight loss > 5% in 3 months **or** – Food intake 50–75% of normal requirements in preceeding week	1 mild	1 mild	e.g. hip fracture, chronic disease, in particular with acute complications: cirrhosis, COPD, chronic haemodialysis, diabetes, cancer
– Weight loss > 5% in 2 months **or** – BMI 18.5–20.5 + impaired general condition **or** – Food intake 25–50% of normal requirements in preceeding week	2 moderate	2 moderate	e.g. major abdominal surgery, stroke, severe pneumonia, haematologic malignancy
– Weight loss > 5% in 1 month (> 15% in 3 months) **or** – BMI < 18,5 + impaired general condition **or** – Food intake 0–25% of normal requirements in preceeding week	3 severe	3 severe	e.g. intensive care patients (APACHE > 10), head injury, bone marrow transplantation

Score ☐ + ☐ **Score** = ☐ **If age ≥ 70 years** + **1** = ☐ **Age adjusted total score**

Evaluation

☐ **0 points = low risk**
Repeat screening (weekly)

☐ **1–2 points = moderate risk**
Patient needs nutrition support.

☐ **≥ 3 points = high risk**
Patient needs nutrition support.

Patient related actions

☐ Weekly re-screening
☐ Assessment
☐ Start nutrition therapy (e.g. ONS)
☐ Monitor food and fluid intake
☐ Others _____

Date / Signature

Step 2 Assessment Risk factors for nutrition / fluid deficiency

! To be assessed by a qualified healthcare professional.

Patient related actions

☐ Nausea / vomiting ..... ▸	(e.g. review medication)
☐ Poor appetite ..... ▸	(e.g. try new foods)
☐ Chewing and / or swallowing problems ..... ▸	
☐ Pain ..... ▸	
☐ Gastrointestinal dysfunction / impairment ..... ▸	
☐ Diarrhoea ..... ▸	
☐ Dementia / cognitive decline ..... ▸	
☐ Chronic disease ..... ▸	
☐ Acute infections, Fever ..... ▸	
☐ Increased needs (e.g. wounds) ..... ▸	
☐ Dialysis ..... ▸	
☐ Ascites and / or oedema ..... ▸	
☐ Food allergies / intolerances ..... ▸	
☐ Social / cultural requirements and habits ▸	
☐ Mood ..... ▸	
☐ Psychological factors (e.g. fear) ..... ▸	
☐ Dislike of available food options ..... ▸	
☐ Others ..... ▸	
☐ Others ..... ▸	

Sources:
1. Kondrup J et al. (2003) ESPEN Guidelines on Enteral Nutrition Screening 2002. Clin Nutr; 22: 415 – 421;
2. Adapted from „Early detection and treatment of malnutrition in hospital", Dutch Malnutrition Steering Group, www.fightmalnutrition.eu 2012.

Patient name	Date of birth	Date of admission	Date of screening	Normal weight (kg)	Current weight (kg)	Height (m)	BMI (kg/m²)

Step 3 Nutrition therapy

Intake versus requirement[2]

Compared to a normal (pre-illness) daily intake the patient now eats:

	Intake versus requirement	Ways to close the nutritional gap
☐	**100 %** of requirements	No supplementation necessary
☐	**75 – 100 %** of requirements	Energy- and protein-rich food and consider oral nutritional supplements
☐	**50 – 75 %** of requirements	Oral nutritional supplements
☐	**25 – 50 %** of requirements	If possible: oral nutritional supplements, if not: supplementary or complete tube feeding. Consider parenteral nutrition if enteral nutrition is inadequate or impossible.
☐	**< 25 %** of requirements	Tube feeding. Consider parenteral nutrition if enteral nutrition is inadequate or impossible.

Nutrition plan

Existing nutrition therapy: ☐ oral ☐ tube feeding ☐ parenteral nutrition ☐ none

Consider refeeding syndrome !

☐ **Dietary modifications**
(e.g. High energy / high protein meals)

☐ **Oral nutritional supplements**
(e.g. Product name, ml / units per day)

☐ **Tube feeding**
(e.g. Product name, ml / units per day, flow rate (ml / hour), number of hours (per day), timings)

☐ **Parenteral nutrition**
(e.g. Product name, ml / units per day, flow rate (ml / hour), number of hours (per day), timings)

Date / Signature

Step 4 Monitoring/Follow-up

! Monitor at least once a week.

Check the body weight always at the same time (e.g. in the morning, pre-breakfast, after urination), with similar clothing without shoes, and with the same validated scales.

Week:	1	2	3	4	5	6	7	8
Date								
Weight (kg)								
BMI								
Weight change (+ or – in kg)	▼	▼	▼	▼	▼	▼	▼	▼

+ 10 kg
+ 9 kg
+ 8 kg
+ 7 kg
+ 6 kg
+ 5 kg
+ 4 kg
+ 3 kg
+ 2 kg
+ 1 kg
Initial weight
– 1 kg
– 2 kg
– 3 kg
– 4 kg
– 5 kg
– 6 kg

Week:	1	2	3	4	5	6	7	8
Initials								

Please note: Consider potential influence of oedema on body weight.

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