

NATIONAL GUIDELINES
Diagnostic and Treatment of Acute Malnutrition in Children
From 0 to 72 months old

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

I. Background

Acute malnutrition is the morbidity status, in which the body does not receive adequate required energy and protein due to insufficient consumption or/and other diseases that leads to weight loss (wasting) or edema.

Mortality risk of children with severe acute malnutrition (SAM) is 5 to 20 times higher than healthy children and it can be a direct or indirect cause of mortality in children with common infectious diseases, such as diarrhea and respiratory infection.

The guidelines for the diagnostic and treatment of acute malnutrition is developed to apply for children from 0 to 72 months old.

II. Diagnostic criteria for acute malnutrition disease

A child should have at least one anthropometric criterion to be diagnosed as having acute malnutrition: Middle Upper Arm Circumference (MUAC) or Weight for Height/Length less than the defined cut-off point.

2.1. A child having Moderate Acute Malnutrition (MAM) should have the following signs:

- Anthropometric indicators:
 - + MUAC from 115mm to less than 125mm (this criterion is applied only for children from 6 to 59 months old).
 - + OR Weight for Height/Length (W/H) from -3SD to less than -2SD.
- Clinical signs are often hidden and missed to identify.

2.2. A child having Severe Acute Malnutrition (SAM) should have the following signs:

- Anthropometric indicators:
 - + MUAC less than 115mm.
 - + OR Weight for Height/Length (W/H) less than -3SD
- Clinical signs: depending on the signs, the following forms of SAM can be seen

+ Edema malnutrition (Kwashiorkor)

- Nutritional pitting edema: edema typically starts on the feet and spreads upwards to the whole body if more severe. The features of nutrition edema are bilateral, pitting, white and tender. Nutritional edema is considered a criterion to diagnose acute malnutrition with complication. The edema should be differentiated with other diseases (of heart, kidney...)

- MUAC and W/H can be in normal ranges.

- Diarrhea disorders and respiratory infection are commonly seen.

- Skin depigmentation: red spots can appear in groin area, limbs, buttock, and around anus. The spots often come together in large red patches that would turn black and break down, leaving a cicatrizing skin layer that is prone to infection making the child's skin patchy.

- The malnutrition status can also be seen in other tissues and organs, such as osteoporosis due to calcium deficiency, vitamin A deficiency, enlarged liver with fatty infiltrates, and heart failure due to protein deficiency.

- Sub-clinical signs: reduced hemoglobin, reduced hematocrite, reduced blood protein, reduced pre-albumin, reduced sodium and potassium concentration, reduced blood glucose; reversed ratio of Albumin/Globulin; While Head ratio (non-essential amino acids/essential amino acids is increased – normal range is 0.8 – 2).

+ Wasting malnutrition (Marasmus)

- Marasmus is commonly represented by a shrunken, wasted appearance, loss of muscle mass and subcutaneous fat mass in the face, buttocks and upper limbs. The child looks like an old man.

- Symptom of vitamin A, D, K, B1, B12 can be seen but at a lessen severity.

- Appetite can be lost.

- Sub-clinical signs: reduced hemoglobin reduced hematocrite, reduced blood protein, reduced pre-albumin, reduced blood glucose; changed electrolytes.

+ Combined forms (Marasmic – Kwashiorkor): the child has clinical and sub-clinical signs of both above forms.

III. Guidelines on the treatment of acute malnutrition:

1. Classification of acute malnutrition

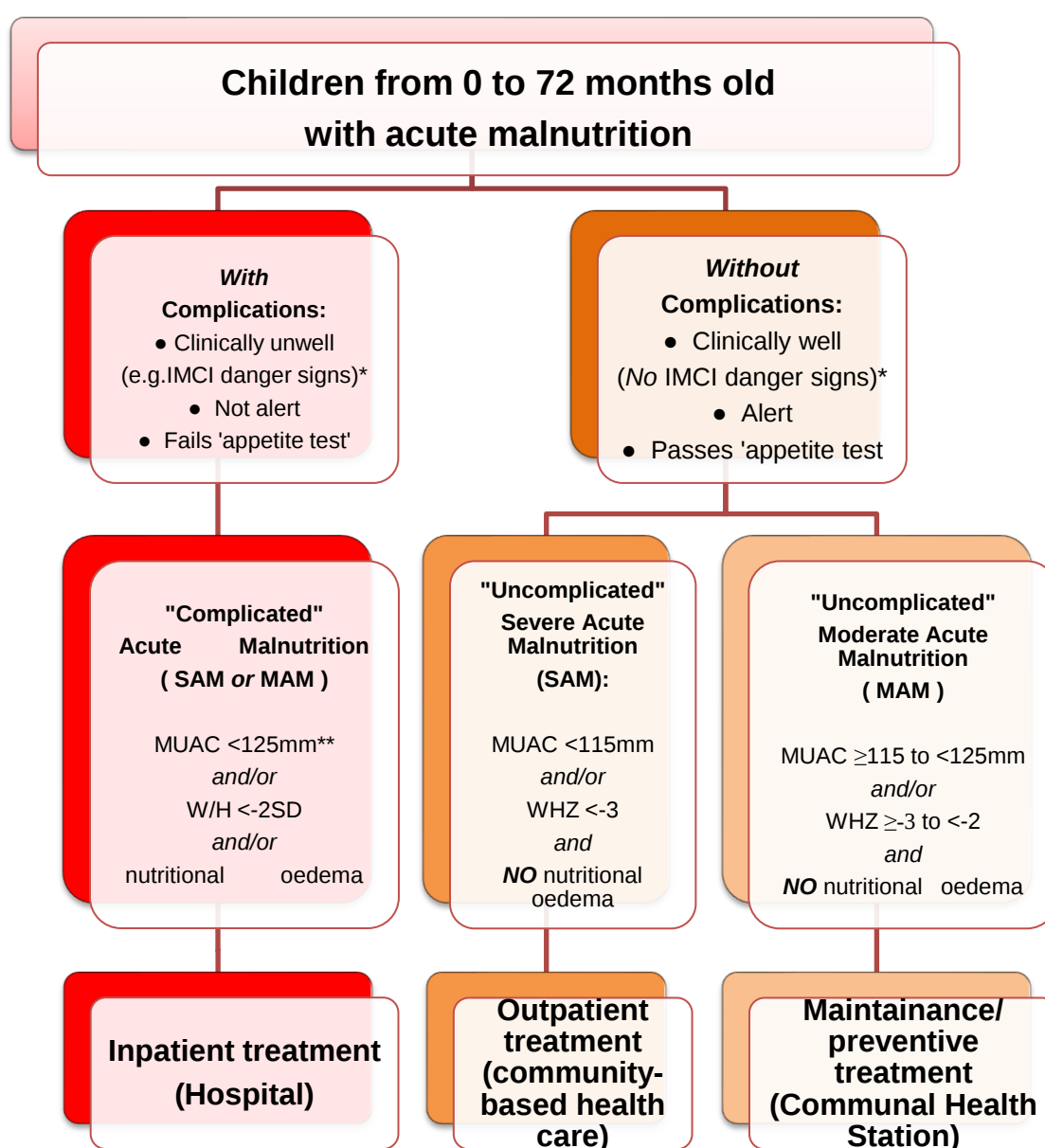
Based on clinical conditions and anthropometric indicators of the child, the classification for treatment includes 3 different arms:

- Inpatient treatment.
- Outpatient treatment.

- Maintenance/preventive treatment.

There are connections and referrals among different treatment components depending on the appearance of complications or the severity of malnutrition (Figure 1). In which, the acutely malnourished child with complications will receive inpatient treatment in hospitals until no more complications (normally within 1 week); she/he will then be referred to community-based health facilities to be managed in outpatient treatment. When she/he reaches the discharged criteria of outpatient treatment (normally within 6 to 10 weeks), she/he will be referred to maintenance/preventive treatment from 2 to 4 months (referring to Treatment Procedure of Child Acute Malnutrition in Annex I).

Figure 1. Classification of treatment for child acute malnutrition



* IMCI danger signs include: unable to drink/breastfeed; vomiting everything; lethargy/unconsciousness; convulsions; stridor; pneumonia with chest indrawing; severe dehydration; severe anemia.

** Diagnosis criteria of MUAC are applied only for children from 6 to 59 months old.

- See MUAC assessment in Annex II
- See Weight/Height look-up table in Annex III
- With children less than 6 months old, refer to Inpatient treatment section below.

2. Sub-clinical tests:

- Regular test: complete blood count (CBC), electrolytes, liver and kidney functions, blood protein/albumin/glucose, serum iron, ferritin, calcium.
- Follow-up and prognosis test: blood pre-albumin, ratio Albumin/Globulin, ratio White Head.
- Other tests for diagnosis and treatment purposes, depending on professional requirements.

3. Treatment:

3.1. Inpatient treatment:

Inpatient stabilization treatment is needed for children with complicated SAM (occasionally also for those with complicated MAM) and for those who deteriorate or do not respond in outpatient treatment. It involves two distinct 'phases':

- Initial 'stabilization' of an acutely unwell and highly vulnerable child
- A 'transition' phase which aims to optimize the transfer to outpatient (rehabilitation-phase) treatment.

Inpatient services should be provided in central, provincial and district hospitals.

In most hospitals, doctors will be responsible for program set-up and organization. Most of the protocols (e.g. feeding and monitoring) are suitable for front-line implementation by nurses.

3.1.1. Admission criteria

Table 1- Admission criteria for inpatient treatment	
Category	Criteria
New admission	▪ SAM or MAM (as previously defined) AND ▪ 'Complications' - <i>any</i> of the following: - vomiting; - lethargy/unconsciousness; - convulsions; - stridor;

	- pneumonia with chest indrawing; - severe dehydration; - severe anemia. - no appetite (Annex IV) - nutritional edema.
Special cases	▪ Infant under 6 months with acute malnutrition. ▪ Eligible for outpatient treatment but care givers refuses
Transfer in from outpatient treatment	Condition has deteriorated. e.g.: ▪ Fails appetite test ▪ Weight loss on 3 consecutive weekly visits ▪ Static weight (no gain) in 4 consecutive weeks ▪ Non-response to treatment ▪ Develops clinical ‘complications’ - Medical condition deteriorates - Onset of nutritional edema

3.1.2. Organization of care

Organizational and operational factors play a key role in determining outcomes from malnutrition. Well organized care also involves:

- **A well-ordered environment** e.g. isolation areas for high-risk infectious cases; good washing/hygiene facilities; warmth (28–32°C, no draughts)
- **Good, clean kitchen areas** for preparation of therapeutic milks
- **High quality equipment** (e.g. weighing scales; length/height boards, MUAC tapes, milk/ReSoMal preparation utensils) that is well looked after and regularly checked/calibrated.
- **Systems which ensure frequent, repeated and careful clinical assessment** so that any medical problems are recognized and treated as early as possible. High risk signs include:
 - + Depressed conscious state (prostration / coma)
 - + Convulsion
 - + Bradycardia (heart rate <80 beats / minute)
 - + Evidence of shock with or without dehydration
 - + Hypoglycaemia < 3 mmol/l
 - + Hypothermia

3.1.3. Treatment

*** *Stabilization (acute) phase***

The common complications in this phase include: Hypoglycaemia; Hypothermia; Dehydration; electrolyte imbalance; infections, micronutrient deficiencies.

The aims of this phase are to stabilize complications and to initiate feeding with proper therapeutic products. It involves:

- Treatment/prevention of hypoglycemia
- Treatment/prevention of hypothermia
- Treatment/prevention of dehydration
- Correction of electrolyte imbalance
- Treatment/prevention of infection
- Correction of micronutrient deficiencies
- Starting cautious therapeutic feeding with proper dose

Step 1: Treatment/prevention of hypoglycemia

Provide proper treatment of hypoglycemia if occurs. Be cautious with IV treatment.

Step 2: Treatment/prevention of hypothermia

Keep the child dry and warm (keep covered, away from draughts in a warm room, heated if necessary, or skin-to-skin contact with the mother). Avoid wetness. Start therapeutic feeding straight away (see step 7).

Step 3: Treatment/prevention of dehydration

- It is difficult to assess hydration status in a severely malnourished child using clinical signs alone. Do not use the IV route for rehydration except in cases of shock or electrolyte imbalance and dehydration but the child can not drink, and then do so with care.
- Normal WHO's ORS has high sodium and low potassium concentration, therefore it is improper for acute malnourished children. ReSoMal is an oral rehydration solution specially formulated for malnourished children.

Table 2. ReSoMal Composition (WHO 1999)

Component	Concentration (mmol/l)
Glucose	125
Sodium	45
Potassium	40
Chloride	70
Citrate	7

Magnesium	3
Zinc	0.3
Copper	0.045
Osmolarity	300

- If ReSoMal is not available, it can be prepared with one sachet of WHO low-osmolarity oral rehydration solution plus 2 L of water with an added 50 g sugar and 45 mL KCl 10%. (This product has 45 mmol sodium, 40 mmol potassium).
- Children with severe acute malnutrition who present with some dehydration or severe dehydration but who are not shocked should be rehydrated slowly, either orally or by nasogastric tube, using oral rehydration solution for malnourished children (5–10 mL/kg/h up to a maximum of 12 h).
- If children are suspected of having cholera or have profuse watery diarrhea they should be given standard WHO low-osmolarity oral rehydration solution that is normally made, not ReSoMal.

- IV rehydration for malnourished children with signs of shocks:

Children with severe acute malnutrition and signs of shock or severe dehydration and who cannot be rehydrated orally or by nasogastric tube should be treated with 15ml/kg/h of intravenous fluids, either (in this order):

- Ringer's lactate solution with 5% dextrose.
- Half strength NaCl 0.9% with 5% dextrose
- Half-strength Darrow's solution with 5% dextrose
- Ringer's lactate

If the situation can not be improved, consider the diagnosis to see if the child has infection sepsis or combined conditions.

Step 4: Correction of electrolyte imbalance

Standard F75, F100 milk powder and RUTF already contain the correct amounts of potassium and magnesium.

If using locally made milks, ensure extra potassium 3-4 mmol/kg/d and extra magnesium 0.4-0.6 mmol/kg/d

When rehydrating, use specially formulated ReSoMal solution rather than standard oral rehydration solution.

Prepare food without salt.

Step 5: Treatment/prevention of infection

In severe malnutrition the usual signs of infection, such as fever, are often absent, and infections are often hidden. Therefore, all malnourished children hospitalized should be considered having infections and be treated with proper antibiotics.

Step 6: Correction of micronutrient deficiencies

If malnourished children are treated with F75, F100, RUTF or equivalent products following WHO standards (see Annex XI), the micronutrient deficiencies will be corrected, and therefore it is no need to supplement iron, vitamin A, zinc, folic acid, other micronutrients...

- Vitamin A

- + If a child has SAM and eye signs of Vitamin A deficiency and/or has had recent measles: Give a high dose (Children 0-6 months: 50 000 IU, Children 6-12 months: 100 000 IU; Children 1 to 6 years: 200 000 IU) of vitamin A on day 1, with a second and a third dose on day 2 and day 15 (or at discharge from the program), irrespective of the type of therapeutic food they are receiving.

- + If a child does not receive therapeutic feeding as WHO standards, give the daily recommended nutrient intake of vitamin A throughout the treatment period: about 5000 IU vitamin A daily or a high dose of vitamin A (50.000 IU; 100.000 IU or 200.000 IU, depending on age) on admission.

- Zinc

All malnourished children who present with diarrhea should receive zinc as soon as possible to reduce the duration and severity of the episode and the risk of dehydration. If F75, F100, RUTF are used, there is no need to supplement. Otherwise, Zinc is supplemented in 10 to 14 days:

- + Children under 6 months: 10mg Zinc/day.

- + Children over 6 months: 20mg Zinc/day.

- Other micronutrients: if there is no specialized therapeutic feeding available, supplement daily in at least 2 weeks with:

- + Folic acid 1 mg/day (give 5mg on day 1 only)

- + Multi nutrients: Copper 0.3 mg/kg/day; Iron 3 mg/kg/day but only when stabilized and gaining weight.

Step 7: Starting cautious therapeutic feeding with proper dose

This is started cautiously as soon as possible. This aim is to provide just enough energy and protein to maintain basic physiological processes and stabilize the child, thus reducing short-term risk of death. Weight gain is *not* expected during stabilization. A specially formulated nutritional treatment is used. F-75 milk is recommended (see Annex V for preparation details) and feeding follows these basic principles:

Table 3 – Principles of therapeutic feeding during the stabilization phase

- Use of a therapeutic milk that has low: protein, fat, lactose, vitamins/minerals, osmolarity (to avoid overloading the gut, liver and kidneys)
- A total intake being increased to reach the level of 100 kcal/kg/day (=130ml/kg/day of F-75)
 - Start with body fluid requirement and increase gradually.
 - Divide up into small volumes of milk given frequently.
 - Reduce volume (100 ml/kg/day) if the child has severe edema.
- Oral feeds wherever possible; Nasogastric (NG) feeds if needed (e.g. if vomiting or not tolerating oral feeds; if has oral sores and cannot swallow).
- Being cautious using intravenous fluids (due to risk of fluid overload/ electrolyte imbalance).
- Encourage breastfeeding wherever possible: breastfeed *before* therapeutic milk, but also ensure that nutritional needs met by full volume of therapeutic milk.

The child should be fed 8 times a day (i.e. every 3 hours) including overnight. If night feeding is difficult, 6 feeds a day can sometimes be acceptable and the 8-feed per day protocol reserved only for the sickest children e.g. who cannot eat for many days; are severely ill or severely vomit or have diarrhea if large amount is given each feed.

*** Transition phase**

The aim of transition phase treatment is to effectively manage the change from stabilization phase feeds to the more nutrient-dense rehabilitation phase feeds. The risks of this switch, especially if done too quickly are diarrhea and refeeding syndrome (which is not uncommon and can include heart dysrhythmias; heart failure; respiratory distress; acute kidney failure; even sudden death).

A child is ready to move from 'stabilization' to 'transition' phase feeding when:

Table 4 – Criteria for progressing to transition phase treatment

- **Appetite returning:** *finishing F75 volume easily.*
- **Clinically improving:** *e.g. no serious medical problems such as vomiting, watery diarrhea, dehydration, NG feeding, respiratory distress, or any complications which requires IV infusion*
- **Edema subsiding:** *in edematous malnutrition, as evidenced by clinically examination and weight loss.*

Transition phase treatment progresses according to how well it is tolerated by a child. It usually occurs over 2-3 days, but can be longer if a child is unwell. Details of the feeding regime depend on whether RUTF (see Annex VI) or F100 (see Annex VII) is used for rehabilitation phase feed. Increase the feeding volume every 10%/2 days until when the child can not take more, trying to reach 100-135 kcal/kg/day. Breastfeeding should be done just before giving therapeutic diet.

Options for transition-phase feeding:

a. In inpatient settings where RUTF is provided as the therapeutic food in the rehabilitation phase (following F-75 in the stabilization phase):

Two options for transitioning from F-75 to RUTF are possible:

- Start feeding by giving RUTF as prescribed for the transition (100-135kcal/kg/day). Let the child drink water freely. If he/she does not take the prescribed amount of RUTF, then top up with F-75 milk. Increase the amount of RUTF over 2–3 days until the child takes the full requirement of RUTF (150-220 kcal/kg/day, 170kcal/kg/day average). Do not use RUTF for children under 6 months old.

or

- Give the prescribed amount of RUTF for the transition phase. Drink water freely. If the child does not take at least half the prescribed amount of RUTF in the first 12 hours, then stop giving RUTF and give F-75 again. Retry the same approach after another 1–2 days until the child takes the full amount of RUTF.

b. In inpatient settings where F-100 (or equivalent) is provided as the therapeutic food in the rehabilitation phase

- When ready for transition, replace the F-75 diet with an equal amount of F-100 milk for minimum 2 days. If still continues to improve, gradually increase to full volume of F-100 milk (150-220 kcal/kg/day, 170kcal/kg/day average)
- Once rapidly gaining weight on F-100, switch to RUTF and observe that the child can eat full amount before transfer to outpatient treatment.

c. For children referred from outpatient treatment to inpatient treatment as a result of static weight or weight loss, rather than with severe complications

- These children may be treated immediately with RUTF if they already have appetite. If not, they should start stabilization phase treatment with F-75.

A child is not expected to reach his/her target weight ($W/H=-2SD$) whilst still an inpatient. Nutritional and clinical rehabilitation can continue at home in the

outpatient component.

To ensure that success is likely, before transferring the child to the outpatient treatment he/she should be observed for at least 24 hours eating RUTF to ensure he/she manages it well and does not develop complications.

Problems during transition-phase feeding

- If a child develops clinical complications (Table 1), return to stabilization phase feeds using F-75 and provide appropriate medical care.
- If a child is unable to take RUTF for 4–5 days, begin rehabilitation phase using F-100. Continue to offer RUTF alongside F-100. If RUTF is unavailable or the child doesn't want to eat it, F100 is nutritional similar and is a good alternative.

With infants under 6 months having acute malnutrition

- All under 6 month infant with acute malnutrition should be admitted to be treated as inpatients.
- Mothers or female caregivers should be supported to breastfeed. If an infant is not breastfed, support should be given to the mother or female caregiver to re-lactate. If this is not possible, wet nursing should be encouraged.
- Infants should also be provided a supplementary feed:
 - Infants under 6 months with no edema should be treated with (in order of preference, given either alone or as a supplement to breast milk): expressed breast milk; commercial (generic) infant formula; F-75 milk or diluted F-100 milk (Annex VII). Infants under 6 months should not be given undiluted F-100 at any time (owing to the high renal solute load and risk of hypernatraemic dehydration);
 - Infants under 6 months with edema should be treated with infant formula or F-75 milk (given as a supplement to breast milk).

3.1.4. Discharges/Transfers

Table 5 – Criteria for discharges/transfers of inpatient treatment

Category	Criteria	What to do
Stabilized	▪ Clinically stable: <i>alert, no danger signs; no significant medical problems needing inpatient care/investigation</i> AND ▪ Bilateral pitting edema gone	Transfer to outpatient treatment or to a lower treatment level.
Non-response	▪ No improvement in appetite or edema after 4 consecutive days of treatment	Refer to upper treatment level or

	▪ Still edematous or not transferred to the rehabilitation phase feeds after 10 days of treatment ▪ Weight gain <5g/kg/day in rehabilitation phase feeds	specialized treatment.
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3.2. Outpatient treatment:

Outpatient therapeutic treatment provides home-based treatment and rehabilitation for children with uncomplicated SAM. Outpatient treatment services should be carried out on a weekly basis.

Operational sites can be mainly at community level. Depending on specific cases, it can also be done in other health facilities appropriate to the malnourished child's condition. The treatment should be managed directly by doctors/assistant doctors.

3.2.1. Admission criteria

Table 6- Admission criteria to outpatient treatment

Category	Criteria
New admission	▪ MUAC* < 115mm OR W/H < -3SD AND ▪ The child is alert and clinically well (No IMCI danger signs) ▪ Has appetite ▪ No edema.
Other admission	▪ Special cases e.g. twin** ▪ Eligible for inpatient treatment but caregiver refuses this despite advice.
Transfer in from inpatient treatment	▪ Child with complicated SAM/MAM who has successfully been stabilized in inpatient treatment
Transfer in from outpatient treatment	▪ Child from another outpatient treatment centre who has not yet completed treatment.

** MUAC criteria to be applied only for children 6-59 months old.*

*** Where only one twin is severely malnourished, only the malnourished twin should be registered and admitted to outpatient treatment. The non-malnourished twin is also given a full RUTF ration but no medicine. The double ration should be noted on the outpatient card of the malnourished twin.*

3.2.2. Treatment:

- Give other medicines if clinically indicated, according to local/national guidelines.
- Give routine medicines - including a short course of antibiotics- to all children admitted to outpatient therapeutic treatment (see Annex VIII).
- Nutritional treatment is given in the form of RUTF with a ration of 170 kcal/kg/day for nutrition recovery.
 - + Determining and giving the correct amount of RUTF to the child's care givers. Rations are based on the child's current weight and the time before the next RUTF distribution (Annex IX).
 - + Educating the care givers about the nutritional treatment of SAM using RUTF (Annex X).
- For children transferred from inpatient treatment, check the health status, health records and medicines that had been given already to have an appropriate treatment.
- Instruct and advise the caregivers on the administration of medicines and on the importance of complying with the treatment protocol, nutrition and home care. Those who are currently having infections should not be care givers.
- Follow-up visits: health staffs at the clinics should collect and record the following information in monitoring cards during each visit:
 - + Weight and MUAC should be checked at each visit.
 - + Height/length should be measured: on admission; every month thereafter; at discharge (i.e. when W/H target weight is reached)
 - + Clinical history (focusing on any illnesses since the previous visit)
 - + Clinical examination findings.
 - + Appetite test with RUTF.
 - + Provide the appropriate ration of RUTF and record on the RUTF ration card. Reinforce education messages.
 - + Instruct caregivers to collect and return empty RUTF sachets to ensure the compliance.
- Acute malnourished children require special attention if having one of the following signs:

- + Child loses weight on two consecutive visits.
- + Weight or medical condition does not improve within three weeks (static weight or small gains and losses in weight).
- + The child has not been complied with the treatment.
- + Child was initially treated in the inpatient treatment.

These children should be given special attention at follow-up visits or be visited at home to explore the causes for better treatment.

3.2.3. Discharges/Transfers

Table 7- Criteria for discharges/transfers of outpatient treatment

Category	Criteria	What to do
Cured	▪ $W/H \geq -2SD$ OR $MUAC \geq 125$ mm for 2 consecutive visits AND ▪ Clinically improved with no nutritional edema	Refer to Maintenance/Preventive treatment
Transfer to inpatient treatment	Condition has deteriorated and requires inpatient treatment: ▪ Fails the appetite test ▪ Medical condition deteriorates ▪ Onset of nutritional edema ▪ Weight loss on 3 consecutive weekly outpatient visits ▪ Static weight (no weight gain) in 4 consecutive weeks ▪ Target weight has not been reached after 3 months in the program* (non-response)	Refer to inpatient treatment

* Target weight is the cutoff of W/H at $-2SD$

3.3. Maintenance/Preventive Treatment:

Maintenance/Preventive treatment (aka supplementary feeding) supports children with uncomplicated MAM and also provides continued care for those who have completed outpatient therapeutic treatment. It supplements energy and nutrients that may be missing or deficient in their diet by providing either dry take-home rations or ready-to-use supplementary food (RUSF) or home nutrient-riched foods. The aim is to provide support during a two to four-month

period which will restore the patient to an acceptable body weight and health. Maintenance/Preventive treatment can be implemented at the community level and doctors/assistant doctors are those in charge.

3.3.1. Admission criteria

Table 8 – Admission criteria of maintenance/preventive treatment

- MUAC from 115 to 125mm*

OR

- W/H $\geq$ -3 SD and $<$ -2SD
- Clinically well (No IMCI danger signs, alert, good appetite)

Transfers in:

- All acutely malnourished children discharged from outpatient therapeutic treatment requiring continued nutritional care or follow-up
- From another supplementary feeding program

** MUAC criteria to be applied only for children 6-59 months old.*

3.3.2. Treatment

Admission to a supplementary feeding program is also an opportunity to catch-up with any routine medications such as: immunizations; vitamin A; deworming.

This involves:

- Checking the weight every month
- Checking the height/length every 3 months
- Following the national guidelines regarding provision of supplementary and/or complementary feeding supports.
- Providing health and nutrition counseling to the caregivers, particularly on infant and young child feeding (IYCF) practices, disease prevention and basic treatment (diarrhea, ARI) and nutrition care during illness.
- Arranging the follow-up visits every month to obtain supplementary food and nutrition counseling.
- Continuing with supplementary food until the child's W/H is $\geq$ - 2 and thereafter another two months to ensure that level is maintained.

3.2.3. Discharge/Transfers

Table 9 – Criteria for discharges/transfers of maintenance/preventive treatment

Category	Criteria	What to do
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Cured	▪ MUAC $\geq$ 125 mm OR W/H $\geq$ -2 SD for two consecutive visits <i>Four month total stay if discharged from outpatient and inpatient treatment</i>	End the treatment
Non-response	▪ MUAC < 115 mm OR W/H < -3SD (i.e. deteriorates to uncomplicated SAM) ▪ Weight loss on two consecutive visits ▪ Non-response: Has not reached discharge criteria within four months <i>In all these cases, assessment at the outpatient treatment centre should include clinical examination to determine possible causes of the deterioration</i>	Refer to outpatient treatment

IV. Malnutrition prevention

Nutrition education and communication should be reinforced to improve nutrition care practices for mothers and young children, including:

- Nutrition counseling and care for pregnant and lactating women.
- Recommended breastfeeding practices: early initiation of breastfeeding within 1 hour after delivery, exclusive breastfeeding in the first 6 months, continued breastfeeding to 2 years and beyond.
- Nutrition care for children who are sick or failed to growth.
- Iron/folic acid supplementation and anemia prevention for women and children.
- Vitamin A prevention for women and children.
- Utilization of iodized salts for all household members.
- Completed immunization requirements.

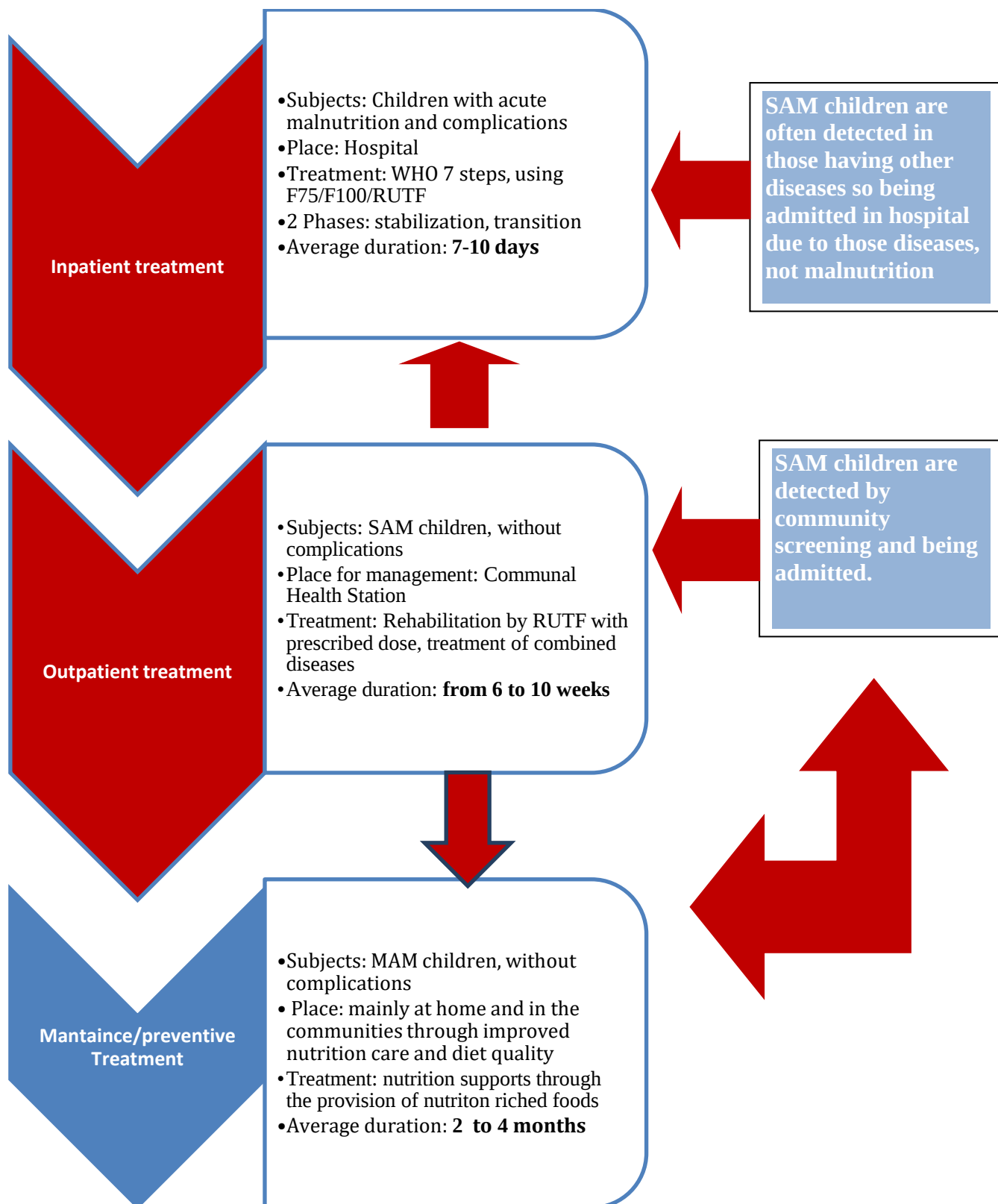
On behalf of Minister of Health

VICE MINISTER

(Signed)

Nguyen Viet Tien

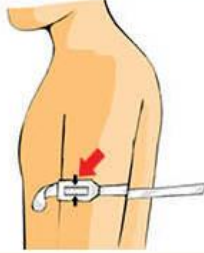
Annex I
Treatment Procedure of Acute Malnutrition in children 0-72 months old
(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

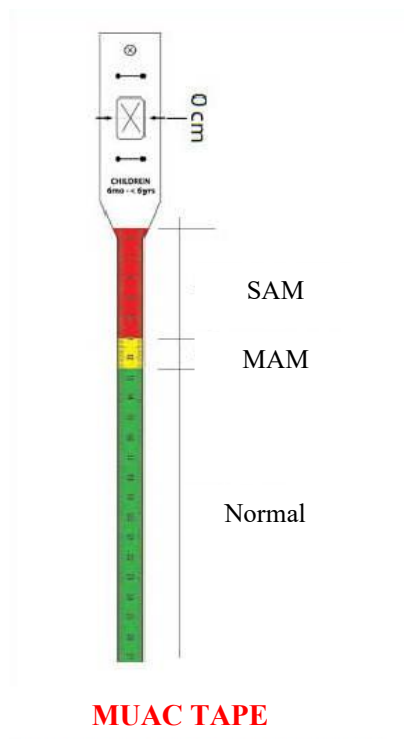


Annex II

MUAC measurement

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

		
Locate tip of shoulder	Tip of shoulder Tip of elbow	Place tape at tip of shoulder (the arrow is 0 horizontally). Pull tape past tip of bent elbow (the hand folds 90°)
		
Mark mid point	Correct tape tension, not too tight or too loose	Read the measurement at the arrow



Annex III

Weight for Height/Length Z-score Table

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

MAM: W/H (or W/L) > -3 SD to <-2 SD

SAM: W/H (or W/L) < -3SD

Target weight: W/H (or W/L) ≥ 2SD

Boy weight (kg)			Length	Girl weight (kg)		
-3SD	-2SD	Median	Cm	Median	-2SD	-3SD
2.4	2.6	3.1	49	3.2	2.6	2.4
2.6	2.8	3.3	50	3.4	2.8	2.6
2.7	3.0	3.5	51	3.6	3.0	2.8
2.9	3.2	3.8	52	3.8	3.2	2.9
3.1	3.4	4.0	53	4.0	3.4	3.1
3.3	3.6	4.3	54	4.3	3.6	3.3
3.6	3.8	4.5	55	4.5	3.8	3.5
3.8	4.1	4.8	56	4.8	4.0	3.7
4.0	4.3	5.1	57	5.1	4.3	3.9
4.3	4.6	5.4	58	5.4	4.5	4.1
4.5	4.8	5.7	59	5.6	4.7	4.3
4.7	5.1	6.0	60	5.9	4.9	4.5
4.9	5.3	6.3	61	6.1	5.1	4.7
5.1	5.6	6.5	62	6.4	5.3	4.9
5.3	5.8	6.8	63	6.6	5.5	5.1
5.5	6.0	7.0	64	6.9	5.7	5.3
5.7	6.2	7.3	65	7.1	5.9	5.5
5.9	6.4	7.5	66	7.3	6.1	5.6
6.1	6.6	7.7	67	7.5	6.3	5.8
6.3	6.8	8.0	68	7.7	6.5	6.0
6.5	7.0	8.2	69	8.0	6.7	6.1
6.6	7.2	8.4	70	8.2	6.9	6.3
6.8	7.4	8.6	71	8.4	7.0	6.5
7.0	7.6	8.9	72	8.6	7.2	6.6
7.2	7.7	9.1	73	8.8	7.4	6.8
7.3	7.9	9.3	74	9.0	7.5	6.9
7.5	8.1	9.5	75	9.1	7.7	7.1
7.6	8.3	9.7	76	9.3	7.8	7.2
7.8	8.4	9.9	77	9.5	8.0	7.4
7.9	8.6	10.1	78	9.7	8.2	7.5
8.1	8.7	10.3	79	9.9	8.3	7.7
8.2	8.9	10.4	80	10.1	8.5	7.8
8.4	9.1	10.6	81	10.3	8.7	8.0
8.5	9.2	10.8	82	10.5	8.8	8.1
8.7	9.4	11.0	83	10.7	9.0	8.3
8.9	9.6	11.3	84	11.0	9.2	8.5

Boy weight (kg)			Length	Girl weight (kg)		
-3SD	-2SD	Median	Cm	Median	-2SD	-3SD
9.1	9.8	11.5	85	11.2	9.4	8.7
9.3	10.0	11.7	86	11.5	9.7	8.9
9.6	10.4	12.2	87	11.9	10.0	9.2
9.8	10.6	12.4	88	12.1	10.2	9.4
10.0	10.8	12.6	89	12.4	10.4	9.6
10.2	11.0	12.9	90	12.6	10.6	9.8
10.4	11.2	13.1	91	12.9	10.9	10.0
10.6	11.4	13.4	92	13.1	11.1	10.2
10.8	11.6	13.6	93	13.4	11.3	10.4
11.0	11.8	13.8	94	13.6	11.5	10.6
11.1	12.0	14.1	95	13.9	11.7	10.8
11.3	12.2	14.3	96	14.1	11.9	10.9
11.5	12.4	14.6	97	14.4	12.1	11.1
11.7	12.6	14.8	98	14.7	12.3	11.3
11.9	12.9	15.1	99	14.9	12.5	11.5
12.1	13.1	15.4	100	15.2	12.8	11.7
12.3	13.3	15.6	101	15.5	13.0	12.0
12.5	13.6	15.9	102	15.8	13.3	12.2
12.8	13.8	16.2	103	16.1	13.5	12.4
13.0	14.0	16.5	104	16.4	13.8	12.6
13.2	14.3	16.8	105	16.8	14.0	12.9
13.4	14.5	17.2	106	17.1	14.3	13.1
13.7	14.8	17.5	107	17.5	14.6	13.4
13.9	15.1	17.8	108	17.8	14.9	13.7
14.1	15.3	18.2	109	18.2	15.2	13.9
14.4	15.6	18.5	110	18.6	15.5	14.2
14.6	15.9	18.9	111	19.0	15.8	14.5
14.9	16.2	19.2	112	19.4	16.2	14.8

Annex IV

Appetite Test

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

Appetite test is the most important criterion to decide if a patient should be admitted to inpatient or outpatient treatment. Appetite test is administered using RUTF or equivalent products used for rehabilitation feeding.

How to do appetite test:

1. The appetite test should be conducted in a separate area which is private and quiet
2. Explain to the mother/caregiver the purpose of the appetite test and how it will be carried out.
3. The mother/caregiver should wash her/his hands.
4. The mother/caregiver should sit comfortably with the child on her/his lap and either offer the RUTF from the packet or put a small amount on her/his finger and give it to the child.
5. The mother/caregiver should offer the child the RUTF gently, encouraging the child all the time. If the child refuses then the mother/caregiver should continue to quietly encourage the child and take time over the test. The test usually takes a short time but may take up to one hour. The child must not be forced to take the RUTF. The child needs to be offered plenty of water to drink from a cup as he/she is taking the RUTF.

The result of the appetite test:

Pass. *A child that takes at least the amount shown in the table below passes the appetite test.*

Fail. *A child that does not take at least the amount of RUTF shown in the table should be referred for in-patient care.*

Table: The amount of RUTF that should be taken at least to assess the appetite

Body weight (kg)	RUTF in sachet
Less than 4kg	1/8 to 1/4
4 – 6.9	1/4 to 1/3
7 – 9.9	1/3 to 1/2
10 – 14.9	1/2 to 3/4
15 – 29	3/4 to 1
Over 30	>1

Notice: If the care giver/health worker thinks the child is not taking the RUTF because s/he doesn't like the taste or is frightened, the child still needs to be referred to in-patient care for at least a short time. In that case, while starting the F75, retry the appetite test in better conditions. If it is found that the child actually takes sufficient RUTF to pass the test then they can be immediately transferred to out-patient treatment.

Annex V

F-75 Feeding Chart in Stabilization Phase of Inpatient Treatment (Issued with Decision No. 4487/QD-BYT dated August 18, 2016)

Child weight (kg)	12 feeds/day ml for each feed*	8 feeds/day ml for each feed	6 feeds/day ml for each feed**	5 feeds/day ml for each feed
2.0 to <2.2 kg	25 ml 1 feed	40 ml 1 feed	50 ml 1 feed	65 ml 1 feed
2.2 - <2.5	30	45	60	70
2.5 - <2.8	33	50	65	75
2.8 - <3.0	35	55	70	80
3.0 - <3.5	38	60	75	85
3.5 - <4.0	40	65	80	95
4.0 - <4.5	43	70	85	110
4.5 - <5.0	48	80	95	120
5.0 - <5.5	55	90	110	130
5.5 - <6.0	60	100	120	150
6.0 - <7.0	70	110	140	175
7.0 - <8.0	80	125	160	200
8.0 - <9.0	90	140	180	225
9.0 - <10.0	95	155	190	250
10.0 - <11.0	100	170	200	275
11.0 - <12.0	115	190	230	275
12.0 - <13.0	125	205	250	300
13.0 - <14.0	138	230	275	350
14.0 - <15.0	145	250	290	375
15.0 - <20.0	150	260	300	400
20.0 - <25.0	160	290	320	450
25.0 - <30.0	175	300	350	450
30.0 - <40.0	185	320	370	500

* The default for most children is 8 feeds per day. Very sick children may need even more regular, two hourly feeds when first admitted.

** In some circumstances (e.g. lack of night staff on a ward) 8 feeds per day (3 hourly) may not be possible: use the next best alternative in this case – though still aim to give the sickest children the most regular feeds.

Annex VI

RUTF Ration for Inpatient Transitional Phase (in 24 hour)

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

Child weight	RUTF weight (g)	Sachet	Total Kcal
3.0 to <3.5	90	1.00	500
3.5 -<4.0	100	1.00	550
4.0 - < 5.0	110	1.25	600
5.0 -<6.0	130	1.50	700
6.0 - < 7.0	150	1.75	800
7.0 - < 8.0	180	2.00	1000
8.0 -< 9.0	200	2.00	1100
9.0 - <10.0	220	2.50	1200
10.0 - <12.0	250	3.00	1350
12.0 - <15.0	300	3.50	1600
15.0 - <25.0	370	4.00	2000
25.0 -<40.0	450	5.00	2500

Annex VII

F-100 Feeding Chart in Inpatient Transitional Phase

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

Child weight (kg)	8 feeds a day	6 feeds a day	5 feeds a day
Under 3kg	Do not feed whole F100 but diluted		
3.0 to <3.5 kg	60 ml 1 feed	75 ml 1 feed	85 ml 1 feed
3.5 – <4.0	65	80	95
4.0 – <4.5	70	85	110
4.5 – <5.0	80	95	120
5.0 – <5.5	90	110	130
5.5 – <6.0	100	120	150
6.0 – <7.0	110	140	175
7.0 – <8.0	125	160	200
8.0 – <9.0	140	180	225
9.0 – <10.0	155	190	250
10.0 – <11.0	170	200	275
11.0 – <12.0	190	230	275
12.0 – <13.0	205	250	300
13.0 – <14.0	230	275	350
14.0 – <15.0	250	290	375
15.0 – <20.0	260	300	400
20.0 – <25.0	290	320	450
25.0 – <30.0	300	350	450
30.0 – <40.0	320	370	500

The above table is the amount of F100 needed for patients in transitional phase if they cannot eat RUTF. Usually they are fed 6 times per day and not during the night.

Diluted F100 is used for children less than 3kg or infants under 6 months old: Take 100ml of prepared F100, add 35ml water to get 135 ml diluted F100.

Annex VIII

Medications for SAM children in Outpatient Treatment

(Issued with Decision No. 4487/QD-BYT dated August 18, 2016)

Name of Medication	When	Who	Prescription	Dose
AMOXICILLIN (or suitable alternative e.g. co-trimoxazole)	At admission	All children	See protocol	2 times a day for 7 days
ANTI-MALARIAL	At admission in malarial areas	See national protocol (MOH)	See protocol	Single dose on admission
MEBENDAZOLE**	Second visit	< 12 months	DO NOT GIVE	None
		12 – 23 months	250 mg	Single dose on second visit
		≥ 24 months	500 mg	
MEASLES VACCINATION (if eligible / if not yet had)	On week 4	From 9 months	Standard	Once

***MEBENDAZOLE: Or other antihelminth according to national guidelines e.g. ALBENDAZOLE: 12-23 months 200mg, ≥24 months 400mg; both can be given again after 3 months if signs of re-infection appear. Deworming medications are only used for children 12-23 months as directed by doctors

Annex IX

RUTF Ration for Outpatient Treatment

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

RUTF 92g/sachet containing 500 kcal

(average 170 kcal/kg/day)

Child weight (kg)	RUTF (gram)		RUTF (Sachet)	
	Gram/1 day	Gram/1 week	Sachet/1 day	Sachet/ 1 week
3.0 to <3.5	105	750	1.25	8
3.5 – <5.0	130	900	1.5	10
5.0 – <7.0	200	1400	2	15
7.0 –<10.0	260	1800	3	20
10.0 – <15.0	400	2800	4	30
15.0 -<20.0	450	3200	5	35
20.0 – <30.0	500	3500	6	40
30.0 – <40.0	650	4500	7	50

Annex X

Key Messages for Care Givers

(Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

- RUTF is a therapeutic product for very thin children only. It should not be shared.
- Sick children often do not like to eat. Give small regular meals of RUTF and encourage the child to eat often. Your child should have ____ sachets a day.
- RUTF is the only food sick/thin children need to recover during their time in outpatient care. Feed your child only RUTF and breast milk.
- For young children, continue to breastfeed regularly.
- Always offer the child plenty of clean water to drink or breast milk while he or she is eating RUTF.
- Use soap for washing your child's hands before feeding.
- Keep food clean and covered.
- Sick children get cold quickly. Always keep the child covered and warm.
- When a child has diarrhea, never stop feeding. Continue to breastfeed. Give extra food and extra clean water.
 - Thorough hand washing prior to feeds (both child and care giver)
 - Feeding frequently with small amounts of RUTF, washed down with safe drinking water to ensure hydration.
 - The need to finish the entire allocated daily RUTF ration before giving other foods.
 - Continuing breastfeeding if the child is breastfed (give RUTF *after* a breastfeed to ensure that breast milk supply remains stimulated)
 - Emphasizing that RUTF is vital for the recovery of the child and should not be shared with other children or family members
 - The importance of not mixing RUTF with any liquids, as this may foster bacterial growth and cause sickness in the child.

Notes:

The caregiver should be asked to repeat back to check that the messages have been correctly understood. These key messages can be supplemented with more details and more messages if time allows. By the end of the treatment period, other foods (supplementary foods, local foods) should be introduced together with RUTF.

Annex XI

Therapeutic Nutrition Products used for Acutely Malnourished Children (Issued with Decision No. 4487/QĐ-BYT dated August 18, 2016)

The administration of therapeutic nutrition products is a key component in management and treatment of acute malnutrition in children. However, it is important to acknowledge that malnourished children have specific biological features. They might have reduced immune functions, deteriorating severe malnutrition and even death if being fed with improper foods. Therefore, they need to be treated with nutrition products specially designed for different treatment phases. In the meantime, the feeding should be cautious and be monitored carefully to ensure feeding dose and methods following the description.

1. Therapeutic nutrition products used in hospitals

The World Health Organization has recommended two therapeutic products that are the F-75 and F-100 formulation in the treatment of severe acute malnourished children¹. In which, F-75 is used in the initial stabilization phase and F-100 is used in rehabilitation phase.

Requirements of F-75

F-75 is a starter formula used in the initial stabilization phase of severe malnutrition treatment² (WHO, Principles of Care, 2002). F-75 is designed specifically to meet the child needs and does not overload his/her body in the initial stage. F-75 contains 75 kcal and 0.9g protein/100ml. With low protein and sodium and contain high carbohydrates, the formula is easily received by the children and provide the majority of glucose needed. Using the F-75 can prevent the risk of death from severe malnutrition in children

The nutritional composition of F-75 (100ml)

Content	Amount
Energy	75 kcal (315 kJ)
Protein	0.9g
Lactose	1.3g
Potassium	3.6mmol
Sodium	0.6mmol
Magnesium	0.43mmol
Zinc	2.0mg
Copper	0.25mg
% Energy from :	
<i>Protein</i>	5%
<i>Lipid</i>	32%
Osmolarity	333 mOsmol/l

¹**WHO, 1999.** Management of Severe Malnutrition: A Manual for Physicians and Other Senior Health Workers, Geneva, 1999

²**WHO, Principles of Care, 2002.** Training course on the management of severe malnutrition – Principles of Care, 2002

Requirements of F-100

The rehabilitation phase ends when a child starts to feel hungry and expression of appetite. Formula F-100 is the catch-up formula and designed for the child to catch up growth and rebuild waste tissues. F-100 contains a higher energy and protein: 100 kcal and 2.9 g protein per 100 ml.

The nutritional composition of F-100

Content	Amount
Energy	100 kcal (420 kJ)
Protein	2.9g
Lactose	4.2g
Potassium	5.9mmol
Sodium	1.9mmol
Magnesium	0.73mmol
Zinc	2.3mg
Copper	0.25mg
% Energy from :	
<i>Protein</i>	12%
<i>Lipid</i>	53%
Osmolarity	419 mOsmol/l

2. Therapeutic Nutrition Product used in communities

The World Health Organization has recommended the use of Ready-to-Use Therapeutic Food (RUTF) in the treatment of SAM children during rehabilitation phase, especially in communities ³

Requirements for therapeutic nutrition products in communities

SAM children should be fed with palatable foods, with a high energy and protein content and adequate amount of vitamins and minerals to help the child to rebuild waste tissue and continue to catch up growth in the rehabilitation phase of treatment. In addition, therapeutic foods using in communities needs to ensure food safety criteria, easy to prescribe the dosage used, and reduce monitoring.

What is RUTF

RUTF is the Ready-to-use therapeutic food with high energy and protein, and added vitamins and minerals, specially designed for children with severe acute malnutrition and was developed in 1998. RUTF has the nutritional value equivalent to the formula F-100 – the milk based therapeutic food recommended by WHO for the treatment of severe acute malnutrition.

³WHO, WFP, SCN and UNICEF, 2007. Community-based management of severe acute malnutrition: A Joint Statement by the World Health Organization, the World Food Programme, the United Nations Standing Committee on Nutrition and the United Nations Children's Fund, Geneva, 2007

<i>Nutrition composition in 100 g RUTF product</i>			
Moisture content	≤2.5%	Vitamin A	0.8–1,1 mg
Energy	520–550 Kcal	Vitamin D	15–20 µg
Protein	10%–12% NL	Vitamin E	≥20 mg
Lipid	45%–60% NL	Vitamin K	15–30 µg
Sodium	≤290 mg	Vitamin B1	≥0.5 mg
Potassium	≤290 mg/100	Vitamin B2	≥1.6 mg
Calcium	300–600 mg	Vitamin C	≥50 mg
Phosphorus	300–600 mg	Vitamin B6	≥0.6 mg
Magnesium	80–140 mg	Vitamin B12	≥1.6 µg
Iron	10–14 mg	Folic acid	≥200 µg
Zinc	11–14 mg	Niacin	≥5 mg
Copper	1.4–1.8 mg	Pantothenic acid	≥3 mg
Selenium	20–40 µg	Biotin	≥60 µg
Iodine	70–140 µg	Omega 6	3%–10% energy
		Omega 3	0.3%–2.5% energy

(Notes: RUTF contains iron although F-100 does not; At least half of the protein contained in the foods should come from milk products)

RUTF was developed in the form of spread or compressed bar with high-energy dense, and almost no water. This means that the bacteria are difficult to grow in the product. Therefore, these foods can be used safely without the refrigerator and even can be used in areas where hygiene conditions are not optimal.

RUTF used without cooking preparation, so do not destroy the vitamins, minerals during processing as well as minimize preparation time and also particularly suitable for the conditions in which fuel or cooking facilities limited.

ABBREVIATIONS

F75	Milk-based Formula providing 75Kcal/100ml
F100	Milk-based Formula providing 100Kcal/100ml
IMCI	Integrated Management of Childhood Illness
MAM	Moderate Acute Malnutrition
MUAC	Middle Upper Arm Circumference
SAM	Severe Acute Malnutrition
ReSoMal	Rehydration Solution for Malnutrition
RUTF	Ready-to-use Therapeutic Food
RUSF	Ready-to-use Supplementary Food