National
Medical Protocol
for the
Community Based
Management of Acute Malnutrition

FOR PILOT

NEPAL

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Acronyms

CBO	Community Based Organisation
CMAM	Community-based Management of Acute Malnutrition
CTC	Community-base Therapeutic Care
F75	Therapeutic milk used in Phase 1 of in-patient treatment for severe acute malnutrition
F100	Therapeutic milk used in Transition Phase and Phase 2 of in-patient treatment of severe acute malnutrition
FCHV	Female Community Health Volunteer
GI	Gastro-Intestinal
HF	Health Facility
HP	Health Post
HW	Health Worker (at HP or SHP)
IM	Intra Muscular
IMCI	Integrated Management of Childhood Illness
IU	International Units
MAM	Moderate Acute Malnutrition
MCHW	Maternal and Child Health Worker
MUAC	Mid Upper Arm Circumference
NGT	Naso-gastric Tube
NRH	Nutrition Rehabilitation Home
OTP	Out-patient Treatment Programme
OPD	Out-patient Department
PHC	Primary Health Centre
ReSoMal	Oral Rehydration Solution for severely Malnourished patients
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SC	Stabilisation Centre
SFP	Supplementary Feeding Programme
SHP	Sub Health Post
TFU	Therapeutic Feeding Unit
UV	Ultra-Violet
VHW	Village Health Worker
W/H	Weight for Height
W/L	Weight for Length

THE CMAM MODEL

The Community-based Management of Acute Malnutrition (CMAM), originally known as Community-based Therapeutic Care (CTC), approach maximises impact and coverage by bringing nutrition services closer to the household and reducing opportunity costs to carers. It works through decentralized service delivery at regular health facilities (e.g. Primary Health Care Centres, Health Posts and Sub Health Posts) managed by Ministry of Health and Population (MoHP) staff, where necessary supported by NGO staff.

Early case-finding and mobilization are prioritized so that most of the cases of severe acute malnutrition (SAM) can be treated before complications develop. This allows the majority of children to be treated at home through the provision of basic drugs, a take home ration of Ready-to-Use Therapeutic Food (RUTF)[1] and community based follow-up.

CTC was developed in emergency settings, where it was mostly run directly through NGOs. The CMAM approach aims at the sustainable integration of management of acute malnutrition in the regular health services system.

The approach combines three modes of care:

Improved Feeding Program – counselling programme for children with moderate acute malnutrition without complications promoting home-based production of Sarbottam Pitto[2] and behaviour change in child feeding and caring practices.
In the case of nutrition emergency this mode of care can be enhanced or substituted by a *Supplementary Feeding Program (SFP)* – an extra food ration of fortified blended flour for children with moderate acute malnutrition without complications (either as dry ration for home preparation or through (wet-) feeding centres).

Outpatient Therapeutic Program (OTP) – home-based treatment and rehabilitation with weekly (or in some cases fortnightly) ready-to-use therapeutic food (RUTF) distributions, medical treatment using simplified medical protocols, and regular follow-up for children with severe acute malnutrition without complications

Stabilisation Centres (SC) – Inpatient care for acutely malnourished children with medical complications and/or no appetite using standard WHO/IMCI protocols as in phase 1 of a standard Therapeutic Feeding Centre (TFC).

Emphasis is also placed on the linking of CMAM programs with other food security, health and sanitation interventions in order to more holistically address the needs of the affected population.

[1] Ready to Use Therapeutic Food – this is a complete food for the treatment of severe malnutrition. It does not require any preparation. It contains no water and is therefore resistant to bacterial contamination. For specifications see Annex 6

[2] Sarbottam Pitto is a nutritious mixed flour composed of roasted soya beans, maize and wheat or rice, developed specifically for the context of Nepal

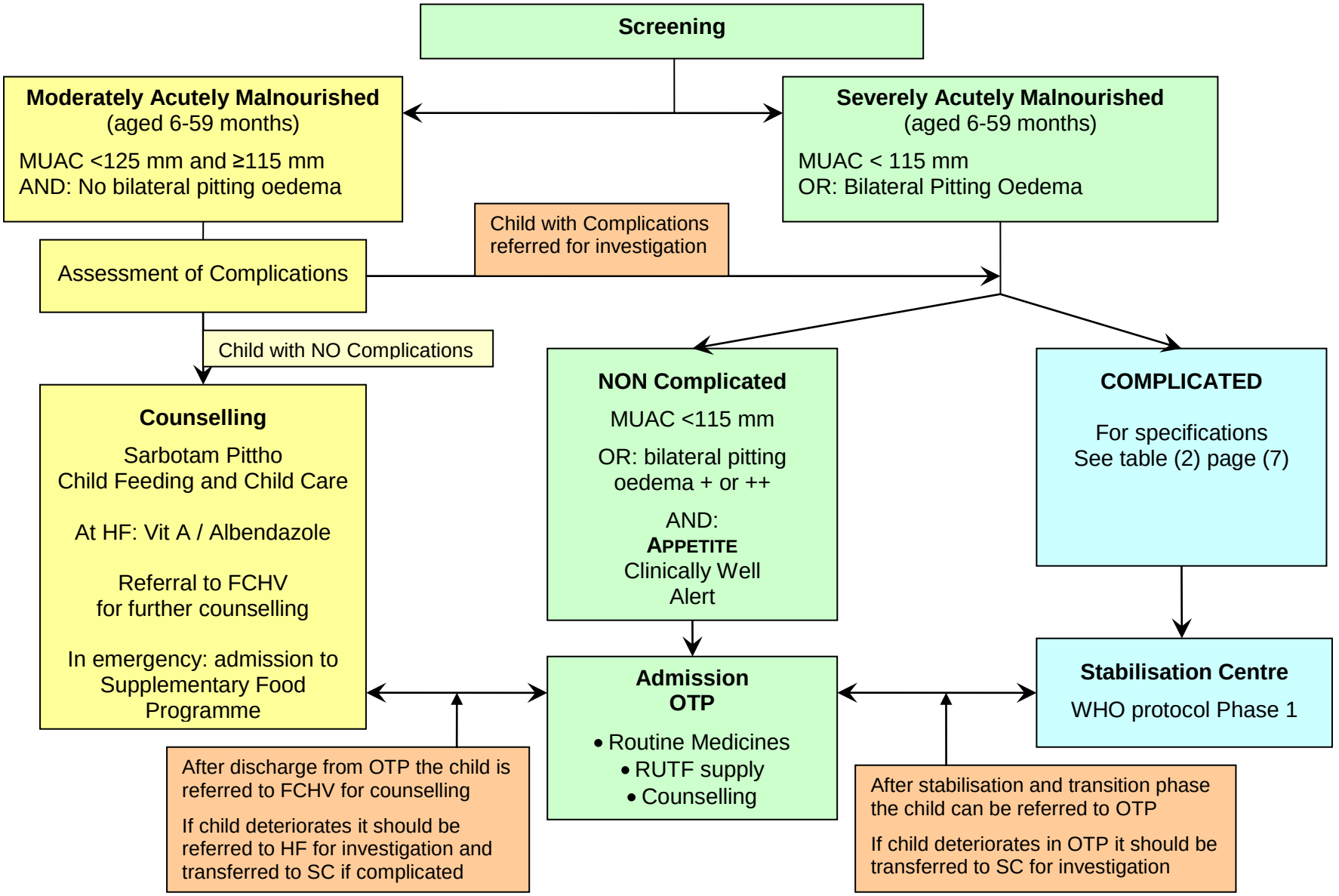
Core operating principles of CMAM[3]

- Maximum coverage and access – CMAM is designed to achieve the greatest possible coverage by making services accessible to the highest possible proportion of a population in need. It aims to reach the entire severely malnourished population.
- Timeliness – CMAM aims to begin case-finding and treatment before the prevalence of malnutrition escalates and additional medical complications occur.
- Appropriate care – CMAM provides simple, effective outpatient care for those who can be treated at home and clinical care for those who need inpatient treatment
- Care for as long as it is needed. By improving access to treatment, CMAM ensures that children can stay in the programme until they have recovered.

This national medical protocol for the community-based management of acute malnutrition (with focus on SAM, but including moderate acute malnutrition (MAM) in Nepal is intended for the instruction and reference of medical doctors, nurses, and programme staff involved in the management and supervision of CMAM programmes. The protocol is based on the WHO protocols for in-patient management of SAM. There are no essential differences as far as the systematic medical treatment is concerned between out-patient or in-patient management. The major difference is that children that do not need specific medical attention for stabilisation of their conditions are treated on an outpatient basis. This shift is facilitated by replacement of water-based F100 Therapeutic milk, which is highly susceptible to bacterial growth, by an oil-based ready-to-use Therapeutic food that can be fed at home under supervision of a caretaker.
For the purpose of training in Nepal, a full package of training manuals and guidelines has been developed to train the different level of health staff and community workers. Further manuals and training suggestions on CMAM can be obtained from the website of FANTA (Food and Nutrition Technical Assistance). These materials have been developed internationally in a joint effort between nutrition organisations involved in the research and trials on which the approach is based.

3 Reference: Community-based Therapeutic Care: A Field Manual. First edition, 2006, Valid International.

PROGRAMME DESIGN



ADMISSION PROCESS

Screening:

Malnourished children (aged 6 months to 5 years) are identified by:

- Measuring the mid –upper arm circumference (MUAC) and
- Checking for the presence of bilateral pitting oedema.

This can be done:

- In the community (FCHV, VHW, MCHW, ECD staff, etc.)
- In SHP, HP, PHC and Out-Patient Department (OPD) of Hospitals

The criteria to be admitted to the programme are shown in the table below.

Table 1 Admission and Discharge criteria

Nutrition status	**Target group**[4]	**Admission criteria**	**Discharge criteria**
Severe acute malnutrition	Children 6 months to 5 years	MUAC < 115 mm and/or presence of bilateral pitting oedema (W/H < -3 Z-score) [5]	no bilateral pitting oedema, minimum weight gain of 15% of admission weight[6], and clinically well
Moderate acute malnutrition	Children 6 months to 5 years	MUAC < 125 mm (W/H < - 2 Z-score and > -3 Z-score)	MUAC > 125 mm (W/H > - 2 Z-score, for at least last two weeks)

MUAC and bilateral pitting oedema are the preferred admission criteria however, if there is the desire to admit additional cases of malnutrition on the basis of weight-for-height criteria, and there are the resources to do so and quality can be ensured, this protocol has the flexibility to allow this.

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[4] Children less than 6 months should be treated as per WHO standard SAM protocols for inpatient care

[5] All cases with confirmed 115 mm MUAC – also those with W/H > -3SD (new WHO standards) - will be admitted to OTP or referred to SC. At health facilities, where assessment capacity for height measurements exists, W/H criteria can be used to identify additional cases, if treatment capacity is available.

[6] A joint WHO/UNICEF statement on the implications of the new WHO growth standards based on an informal consultation in June 2008 has been drafted and will be released soon. The statement endorses new admission and discharge criteria. A 15% weight gain for all children admitted to therapeutic feeding programmes, regardless of whether they were admitted on MUAC or on weight for height is the acceptable discharge criteria. For children with oedema discharge is based on 15% weight gain using the weight after oedema has disappeared as the baseline. For children who have a weight for height above -3SD or a MUAC above 115mm after oedema has disappeared, a discharge two weeks after oedema disappeared is usually sufficient to prevent relapse. MUAC is not a good indicator for recovery because the change of MUAC as a result of treatment is not well established.

COUNSELLING OF MODERATE ACUTE MALNUTRTITION

Assessment for Danger Signs / Medical Complications

The screening staff at the community level will assess all children with MUAC < 12.5 cm (moderate acute malnutrition) for medical complications based on “danger signs” related to the criteria for transfer to in-patient care. All children showing any signs of possible complications will be referred to the nearest health facility for further assessment of the child’s nutrition and health status.

At the health facility a qualified person should assess for medical complications using the criteria for transfer to in-patient care (see page 8) and refer any complicated cases to SC

Counselling

Non complicated moderately acutely malnourished children (MAM) identified by MUAC < 12.5 cm should be given counselling on the importance of nutrition for child development and proper child feeding and child care practices. Special attention should be given to the home based preparation of Sarbottam Pitho, energy density of child food and feeding frequency, hygiene and sanitation, and the importance of sharing responsibilities for child care among family members as per their time availability.

All non-complicated MAM children will be referred to the FCHV for further monitoring and counselling of the child until it has reached MUAC > 12.5 cm. The FCHV will encourage caretakers to take their children to the outreach clinic for growth monitoring in order to track improvements or deterioration of their nutritional status, and get relevant counselling.

If weight increase is not achieved within two months after identification of MAM or when the nutritional status of the child further deteriorates, it will be referred to the nearest health facility (with OTP) for investigation and systematic medical treatment, and if necessary referred to the Stabilisation Centre.

Supplementary Feeding

In case of food insecurity or nutrition emergency supplementary feeding programme (SFP) can be started, distributing dry rations of fortified blended food to moderate acutely malnourished children without medical complications. Caretakers of MAM children should be counselled on the appropriate use and preparation of the food.

OUT-PATIENT THERAPEUTIC PROGRAMME

Target:

Uncomplicated Severe Acute Malnutrition

Identified by:

Children 6 months to 5 years MUAC < 11.5 cm

OR

Bilateral Pitting Oedema (+ and ++)

(W/H < -3 Z-score)

All children less than 6 months of age identified with severe acute malnutrition should be treated in in-patient care till complete recovery, as per the international WHO protocol.

OTP Process

Give identified severely acutely malnourished children sugar-water[7] 10% solution to drink, or water if sugar-water is not available, as the majority of SAM cases will be hypoglycaemic. Give according to how much the child can tolerate but the amount should be approximately 50ml.

If the children receive RUTF immediately after arriving then it may not be necessary to give sugar water[8]. However, all cases that are transferred to SC must receive it.

Children referred from the Stabilisation Centre to an Outpatient Treatment Point after recovery from medical complications do not receive routine medicines because they did already get them during stabilisation. They are dealt with as in a follow-up visit for OTP.

Anthropometrical Measurements

If screening was done at the community level additional anthropometrical measurements need to be taken upon admission at the Health Facility:

- MUAC (in mm)
- Bilateral pitting oedema
- Weight
  (for weight gain assessment during follow up visits, and for W/H)
- Length or Height (in cm, with one decimal)
  (only for monitoring data collection and for W/H as admission criteria)

[7] Sugar water is approximately 10% sugar solution – 10g of sugar per 100ml of water

Assess condition of child and presence of complications

- Assess the appetite; test with RUTF (annex 8) – if child initially refuses move the child and carer to a quiet area. The health worker must observe the child eating the RUTF before the child can be admitted to out-patient care programme
- Take history for Diarrhoea, Vomiting, Stools, Urine, Cough, Appetite, Breastfeeding, Swelling, Oedema (See annex 9)
- Carry out medical assessment (as per IMCI with additional focus on malnutrition complications)
- Asses home situation on possible causes leading to malnutrition

Table 2. Criteria for admission to in- or out-patient care:

Factor	In-patient care	Out-patient care
Oedema	Bilateral pitting oedema Grade 3 (+++) [8] Marasmic kwashiorkor (WHZ<-3SD/ MUAC < 11.5 cm AND oedema)	Bilateral pitting oedema Grade 1 to 2 (+ and ++)
Appetite	No appetite or unable to eat	Yes, good appetite
Medical complications		NO medical complications
Vomiting	Intractable (empties contents of stomach)	
Temperature	Fever > 101.3 °F (38.5°C) under arm pit; (102.2°F/39°C rectal) Hypothermia < 95 °F (35°C) under arm pit; (96°F/35.5°C rectal)	
Respiration rate	≥ 50 resp/min from 6 to 12 months ≥ 40 resp/min from 1 to 5 years ≥ 30 resp/min for over 5 year olds And any chest in-drawing (for children > 6 months)	
Anaemia	Very pale (severe palmor pallor), difficulty breathing	
Superficial infection	Extensive skin infection requiring Intra-Muscular treatment	
Alertness	Very weak, apathetic, unconscious Fitting/convulsions	
Hydration status	Severe dehydration based primarily on recent history of diarrhoea, vomiting, fever, anuria (lack of discharge of urine), thirst, sweating & clinical signs	

[8] See Annex 8 for specification of grades of Oedema

Decide if complications are present using the criteria defined in table 2 above.

- If complications are present explain to the carer the need for in-patient care and refer to nearest Stabilisation Centre.
- Assess whether the caretakers will go to the SC. Caretakers unable or unwilling to take their severely acutely malnourished child with medical complications to the hospital should be counselled about the increased risk of mortality due to SAM, and the limitations of the capacity of the health post to cure their child.
- In case caretakers refuse to go to hospital, regular treatment of medical complications as per standard medical protocol should be undertaken. However, special care should be taken in consideration of compromised and weak metabolism. If the child recovers from medical complications and regains sufficient appetite, he/she can then be admitted to the Health Facility-based outpatient CMAM programme.
- If there are no complications present the child can be treated in OTP

TREAMENT UPON ADMISSION

Nutrition Treatment

Nutritional treatment is through the use of Ready-to-Use Therapeutic Food (RUTF) [9]. (Plumpy'Nut® is the imported RUTF produced by Nutriset in France).

The amount of RUTF a child should consume is determined by the need for an intake of 200 kcal/ kg/ day. [10]

- Teach the carer how to open the packet (after making sure the packet is clean on the outside)
- Explain to the carer how to give RUTF to the child in small amounts frequently (up to 8 times a day), and to finish the entire allocated daily ration each day before giving any other food.
- If the mother is still breastfeeding, she is advised to always give the RUTF after breast milk.
- Emphasise that the RUTF is both a medicine and a diet that is vital for the recovery of the child.
- Explain that plenty of clean water – what the households uses for drinking - should always be given to a child eating RUTF to maintain sufficient hydration. Children will need to drink more water than normal. Water should be given according to thirst as indicated by the child.
- Give orientation on purification of water through boiling and cooling, with water guard, or with purification tablets.
- Give orientation on hygiene and the importance of hand washing with clean water and soap for both caretaker and child before handling food (RUTF) and after each defecation

[9] CMAM does not use a food-based approach for treatment of severe malnutrition, because it requires very intensive guidance and instruction on diet preparation, which can not be made available through regular health services at community level.

[10] This is comparable to the WHO recommendation of 150 to 220 kcal/kg/day for phase 2 of the in-patient management of SAM (for justification see calculations in Annex 4). The CMAM recommendation allows for some sharing with siblings.

Amounts of RUTF to give

The amount given to each patient is according to its current weight. Give the ration amounts as per the table below to each patient to take home:

Table 3. Amount of RUTF to feed and take home in OTP*

Plumpy'Nut®				
92 g (1 sachet) of PN has 500Kcal (average amount to feed: 200kcal/kg/day)				
Weight of child (kg)			**Ration per week (No of Sachets)**	**Ration per day (No of sachets)**	**Consumption per day (No of sachets)**
3.5	**-**	**3.9**	14	**2**	**1.5**
4	**-**	**5.4**	14	**2**	**2**
5.5	**-**	**6.9**	21	**3**	**2.5**
7	**-**	**8.4**	21	**3**	**3**
8.5	**-**	**9.4**	28	**4**	**3.5**
9.5	**-**	**10.4**	28	**4**	**4**
10.5	**-**	**11.9**	35	**5**	**4.5**
> 12			35	**5**	**5**
Give small amount every 3 hours (day and night), with water to drink					

* Since open packages could not be kept overnight in case of rats and other infestations, the number of sachets has been rounded-up for the take-home rations. Actual feeding requirements are reflected under 'consumption'; for further details see Annex 5.

Systematic Treatment / Routine Medicines

Vitamin A

One dose on the day of admission to OTP.

Children with oedema should not be given Vitamin A dose, unless there are signs of deficiency (these children receive vitamin A on day of discharge)

Do not give if the child has received vitamin A in the last one month, or if a national Vitamin A campaign is up-coming within the next month, to prevent toxicity.

Vitamin A systematic treatment:

Age	**Vitamin A IU orally on day of admission**
6 months to 11 months	100,000IU
12 months to 5 years	200,000IU

Systematic Antibiotics

Antibiotics should be given to every severely malnourished patient, even if they do not have signs of systemic infection as the presence of infection may be masked due to immuno-suppression which limits response such as fever.

- Give on admission
- Give 3 times a day for 7 days (10 days if needed)
- The first dose should be given in front of the health worker and an explanation given to the mother on how to continue this treatment at home.

The antibiotic regimen (this can be changed according to the resistance pattern of bacteria that arises from time to time):

➢ First line treatment: Amoxicillin[11]

Dosage of Amoxicillin

Weight (kg)	**Dose**
	Tablets 250mg
≤ 9.9	125 mg (½ tablet) *tid*
10.0 – 19.9	250 mg (1 tablet) *tid*
20.0 – 30.0	375 mg (1½ tablet) *tid*
>30.0	500 mg (2 tablets) *tid*

Amoxycillin tablets and syrup are equally effective but risk of wrong doses is less in dispersible tablets.

Weight (kg)	**Dose**	
	Syrup 125mg/5ml	**Syrup 250 mg/5ml**
≤ 9.9	125 mg (5ml) *tid*	125 mg (2.5ml) *tid*
10.0 – 19.9	250 mg (10ml) *tid*	250 mg (5 ml) *tid*
20.0 – 30.0	375 mg (15ml) *tid*	
>30.0	Give tablets	Give tablets

➢ Second line treatment

Oral Chloramphenicol can be used for children who have not responded to Amoxycillin e.g. continued fever that is not due to malaria.

Give 3 times for 7 days.

[11] Amoxycillin is also effective in reducing the overgrowth of bacteria in the GI tract, commonly associated with severe acute malnutrition, and therefore preferred over Cotrimoxazole which is standard first line antibiotic in Nepal.

Dosage of Chloramphenicol

Weight (kg)	Dose
	Syrup 125mg/5ml
2.0 – 5.9	62.5 mg (2.5 ml) tid
6.0 – 9.9	125 mg (5 ml) tid
10.0 – 19.9	250 mg (10 ml) tid
≥20	375 mg (15ml) tid

Weight (kg)	Dose
	Tablets 250mg
2.0 – 5.9	Give syrup
6.0 – 9.9	125 mg (½ tablet) *tid*
10.0 – 19.9	250 mg (1 tablet) *tid*
≥20	375 mg (1½ tablet) *tid*

Measles

All severe acute malnourished children from 9 months and older should be given measles vaccine on week 4 of their admission in the OTP programme[12, 13].

Children younger than 9 months at admission will be given the vaccination when they complete 9 months, after at least 4 week in OTP.

Malaria

In malaria endemic areas and for patients from endemic areas, where no tests are available, in case of fever below 39ºC and no further medical complications present, systematic treatment with Chloroquine for suspected malaria is given for all patients on admission, according to the national IMCI protocol. [14] [15]

Monitor the child closely for first 48 hours, and if fever condition develops and does not improve, immediately refer to nearest facility where Plasmodium falciparum can be diagnosed.

[12] Severely malnourished children cannot build a sufficient antibody response to give satisfactory protection. The vaccination is given on week 4 so that the nutritional status has improved sufficiently to ensure an antibody response.

[13] Measles vaccination for CMAM OTP patients should be arranged harmonised with EPI immunisation services for cold-chain requirements.

[14] Sulfadoxine-pyrimethamine (Fansidar) is part of the regular protocol for treatment of Falciparum malaria, this drug should not be given within 7 days of folic acid supplementation.

[15] An intravenous infusion of quinine is not safe in severe malnutrition

Dosage of Chloroquine

	Dose*			
	Syrup 50mg/5ml**		Tablet 150mg	
Day	Age less than 12 months	Age 12-59 months	Age less than 12 months	Age 12-59 months
1	7,5 ml (1½ teaspoon)	15,0 ml (3 teaspoon)	½ tablet (75 mg)	1 tablet (150 mg)
2	7,5 ml (1½ teaspoon)	15,0 ml (3 teaspoon)	½ tablet (75 mg)	1 tablet (150 mg)
3	7,5 ml (1½ teaspoon)	7,5 ml (1½ teaspoon)	½ tablet (75 mg)	½ tablet (75 mg)

* Chloroquine syrup should not be administered on empty stomach

** One teaspoon is equal to 5 ml of chloroquine syrup

Iron and folic acid

Iron-folic acid is not to be given routinely.

When moderate anaemia is identified according to IMCI Guidelines, treatment should begin after 14 days in the programme and not before[16] and given according to National/WHO guidelines[17].

For severe anaemia (palmar pallor) refer to inpatient care.

Folic acid is not part of the standard protocol, since the quantity of folic acid present in RUTF is sufficient for needs of the malnourished child.[18]

De-worming

Albendazole is given at the second visit (week 2 [or week 3 for fourtnighly follow-up]) as it is better absorbed after re-conditioning of the Gastro-Intestinal tract with Amoxycillin.

Dosage of Albendazole

Age	**<1 year**	**1 to 2 years**	**>= 2years**
Albendazole	Do not use	200 mg	400 mg

Supplemental medicines

Other medical conditions/symptoms should be treated according to the clinician's judgement. See Annex 2 for a list of supplemental medicines.

[16] Iron is contra-indicated in severely malnourished children as a high-dose may increase the risk of severe infections and therefore in case of moderate anaemia should be given after 14 days after initiation of the treatment.

[17] INACG, 1998

[18] Since Sulfadoxine-pyrimethamine (Fansidar) is part of the national protocol for Falciparum malaria treatment, if malaria is suspected upon admission, no folic acid should be given within 7 days.

Follow-up visits

Children's progress is monitored on a weekly basis[19] at the health facility (SHP, HP, or PHC)

- Weight is measured
- Degree of oedema (0 to +++) is assessed
- MUAC is taken.
- Length or Height is measured every 4 weeks. (if W/H is admission criteria)
- Medical check is completed
- Discuss appetite and perform RUTF appetite test only if there seem to be problems (see page 7, and annex 8)
- Give new ration according to current weight
- Discuss home situation and needed changes in care, hygiene, and feeding practices
- Arrange for home-visit by FCHV or VHW if weight gain is unsatisfactory (static weight or even weight loss since last visit)

At each subsequent visit, a full medical check is conducted. Based on this clinical diagnosis, additional supplemental medicines may be given to children, as required and according to protocols. The medical check and RUTF test will show if children should be transferred to in-patient care.

Table 4. Criteria to move from out-patient to in-patient care

Factor	Additional Criteria during Follow-up
Oedema	Increase of / development of oedema Marasmic kwashiorkor (W/H<-3 Z-score/ MUAC < 115 mm AND oedema)
Appetite	No appetite or unable to eat
Medical complications	As defined in table for admission to in-patient care (page 7; see also Annex 1)
Weight changes	Weight loss for 3 consecutive weighings (2 consecutive weighings for 2 weekly follow-up) Static weight for 5 consecutive weighings (3 consecutive weighings for 2 weekly follow-up)
General	Other general signs the health worker thinks warrants referral (as per IMCI)

[19] Out-patient care can be carried out fortnightly depending on the situation. For example, if mothers are defaulting because they are too busy or the site is far then they may be more likely to attend a fortnightly session.

Discharge from OTP

Discharge Criteria
(for all cases, both admitted on MUAC and on W/H)

- If target weight gain (15%) has been reached. (See table in Annex 11)
- No oedema for two consecutive visits
- AND weight gain has been satisfactory for last two consecutive visits

For children with oedema discharge is based on 15% weight gain using the weight after oedema has disappeared as the baseline. Children that have a weight for height above -3SD or a MUAC above 115mm after oedema has disappeared, will be discharged two weeks after oedema disappeared.

(Children admitted based on MUAC, should not be discharged on targeted W/H, since this is not applicable to them, and may be reached earlier than actual rehabilitation)

Upon discharge children admitted with Oedema will get one dose of Vit A

Children that did not get a doses of Vitamin A upon admission, because they were admitted with oedema should get a single dose upon discharge.
Other children do not get this discharge dose.

Upon discharge children admitted at age 6 to 9 months should get follow-up appointment for second measles vaccination

Children that were younger than 9 months when they were admitted and were not yet administered a measles vaccination should get a vaccination of measles once they complete 9 months of age, like any other child.

If the child has completed 9 months of age during its treatment in OTP, and did not yet get a measles vaccination the caretaker should get a very firm appointment for follow-up visit during EPI hours, or to visit the nearest EPI outreach clinic as soon as possible to receive the vaccination.

Upon discharge the child will get a last ration

To facilitate a smooth transition from the complete and balanced RUTF diet to the regular family diet, a last ration of therapeutic food should be provided upon discharge.

- Child might get last ration of 7 sachets of RUTF (for one week)

Alternatively:

- A ration of *supplementary* RUTF (logistically complex, but providing additional micro-nutrients to complement a nutrient poor family diet)
- A supplementary feeding programme (SFP) ration, and referral to nearest SFP site, if a programme is available in the area (generally only in situation of nutrition emergency)

Upon discharge the caretaker should get Counselling

- Discuss home situation, care practices, feeding practices, food preparation for children etc.
- Support the mother to improve home feeding environment… (if young, suggest her to ask FCHV to explain to her husband and her in-laws)

- Refer to the FCHV for follow-up counselling on improved child feeding and care practices after two weeks / one month/ and two months

Follow-up of rehabilitated cases to prevent relapse

After discharge from OTP children are followed up for three times during 2 months in the community where the family is given counselling on Sarbottam Pitto and child feeding and caring practices.

- FCHV should make follow-up visit after two weeks / one month / and two months to see how transition has gone, and if child is still growing well.
- Any problems with child feeding, nutrition or health should be counselled.

STABILISATION CENTRE

Target:

Complicated Acute Malnutrition

Identified by:

Acutely malnourished children 6 months to 5 years (severe or moderate):

- *Severe nutritional oedema (+++)*

OR

- *MUAC < 125 mm and/or Bilateral Pitting Oedema (+, ++) (or W/H < -2 Z-score)*

AND

Medical complications (see Annex 1) and / or no appetite

OR

Children less than 6 months of age* with:

- *A body weight below 3 kg and incapacity to suckle, lack of breastmilk*

AND/OR

- *Identified with severe acute malnutrition (weight loss, 'baggy pants', and/or nutritional oedema*

* Infants less than 6 months of age should be treated in in-patient care till complete recovery, as per the international WHO protocol.

Cases identified as complicated will be treated in in-patient care as per the International WHO protocol until their medical condition is stabilised and the complications are resolved.
Then the child can continue rehabilitation in out-patient care until weight recovery is achieved.

This part of the CMAM protocol for stabilisation treatment of severe acute malnutrition highlights treatment components of the inpatient treatment in relation to the outpatient programme.

The general principles for routine care should be kept in mind at all times:

Step 1. Treat/prevent hypoglycaemia
Step 2. Treat/prevent hypothermia
Step 3. Treat/prevent dehydration
Step 4. Correct electrolyte balance
Step 5. Treat/prevent infection
Step 6. Correct micronutrient deficiencies
Step 7. Start cautious feeding
Step 8. Achieve catch up growth
Step 9. Provide sensory stimulation and emotional support
Step 10. Prepare for follow-up after recovery

Upon admission, once immediate life-threatening conditions are taken care of as per WHO guidelines for treatment of severely malnourished children, reconfirm nutritional status of the child by anthropometric measurements.

Anthropometric measurements:

Measurements to be taken during admission to In-patient Care

- MUAC
- Bilateral pitting oedema
- Weight
- Length or Height

While MUAC is used as admission criteria Weight for Length/Height z-score should be calculated for monitoring purposes.

Nutrition treatment

SAM cases with medical complications

F75 (130ml =100kcal) should be given for patients of all ages except for the less than 6 months old infant without oedema.

There should be 8 feeds per day (continue feeding at night) [20], see table 5.

Breast-fed children should be offered breast-milk always before the diet and always on demand.

Preparation

Add 1 packet of F75 to 2 litres of water. This gives 2.4 litres of F75.

The amount given to each patient is according to its current weight. Give the amounts as specified in table 5 on page 18 for each individual patient.

MAM cases with medical complications[21]

Cases with good appetite are given RUTF to prevent nutritional deterioration.
The amount is according to weight of the child as per table 3 (page 9).

Cases with NO appetite are given F75 initially, till appetite returns, as per table 5.

Children transferred to SC because of static weight

Cases that are transferred to SC because of lack of weight gain in OTP are treated with RUTF immediately.

[20] In case of unforeseen circumstances, like sudden absency of staff, the feeding schedule could be adapted to 6 feeds

[21] The metabolic system and organ functions of MAM cases have not yet been decreased due to reductive adaptation and therefore they can start with RUTF immediately upon admission in the SC, if they have appetite.

Table 5. Amounts of F75 to give during in-patient care

Class of Weight (kg)	8 feeds per day ml for each feed	6 feeds per day * ml for each feed
2.0 to 2.1 kg	40 ml per feed	50 ml per feed
2.2 - 2.4	45	60
2.5 - 2.7	50	65
2.8 – 2.9	55	70
3.0 - 3.4	60	75
3.5 – 3.9	65	80
4.0 – 4.4	70	85
4.5 – 4.9	80	95
5.0 – 5.4	90	110
5.5 – 5.9	100	120
6.0 – 6.9	110	140
7.0 – 7.9	125	160
8.0 – 8.9	140	180
9.0 – 9.9	155	190
10.0 – 10.9	170	200
11.0 – 11.9	190	230
12.0 – 12.9	205	250
13.0 – 13.9	230	275
14.0 – 14.9	250	290
15.0 – 19.9	260	300

* Under regular circumstances always arrange for eight feeds per 24 hours, including night shifts. In exceptional circumstances, when eight feeds are suddenly not possible, this schedule should be re-adjusted to minimum 6 feeds per 24 hours.

Routine medicines

Vitamin A

Provide on the day of admission.

Dosage of vitamin A systematic treatment

Age	Vitamin A IU orally on day 1
6 to 11 months	100,000IU
12 months (or 8 kg) and more	200,000IU

On the day of admission – except for children with oedema, unless there are signs of deficiency (Children admitted with oedema receive vitamin A on day of discharge)

Do not give vitamin A if child has received vitamin A in the last one month, or if there is a vitamin A campaign up-coming.

Folic acid

Provide on the day of admission.

- 5 mg as one single dose,
- 2.5 mg as one single dose, in malaria endemic area, if the child has no history of fever. [22]

Systematic Antibiotics

Antibiotics should be given to every severely malnourished patient, even if they do not have signs of systemic infection.

The antibiotic regimen (this can be changed according to the resistance pattern of bacteria that arises from time to time in the environment of the unit):

- First line treatment: Amoxicillin [23] (if Amoxicillin is not available, use Ampicillin)
- Second line treatment: two options:
  - plan a) add Chloramphenicol and continue Amoxycillin
  - plan b) add Gentamicin and continue Amoxycillin
- Third line: individual medical decision.

Duration of antibiotic treatment: Every day during Phase 1 + four more days.

Dosage of Gentamycin, Amoxycillin and Chloramphenicol

Weight range	**Plan A**		**Plan B**	
	Dosage per day		Dosage per day	
	Gentamicin	**Amoxycillin**	**Chloram-phenicol**	**Amoxycillin**
Kg	in mg	in mg	in mg (Syrup125mg/ml)	in mg
2 – 6	7.5mg/kg give once daily IM	125 mg * 3	62.5 mg (2.5 ml) * 3	125 mg * 3
6 – 10		250 mg * 3	125 mg (5 ml) * 3	250 mg * 3
10 – 30		375 mg * 3	250 mg (10 ml) * 3	375 mg * 3
> 30		500 mg * 3	500 mg (15 ml) * 3	500 mg * 3

[22] No folic acid should be given within 7 days after administrating Sulfadoxine-pyrimethamine (Fansidar) which is the national protocol for Falciparum malaria treatment, because it works antagonistic on drug effectiveness. Thus if malaria is suspected upon admission, no folic acid should be given till malaria status and treatment are determined.

[23] This is recommended as second-line antibiotic by IMCI: it is given to these grossly immuno-compromised patients who are severe enough to be admitted into hospital Amoxycillin is also effective in reducing the overgrowth of bacteria in the GI tract, commonly associated with severe acute malnutrition, and therefore preferred over Cotrimoxazole which is standard first line antibiotic in Nepal.

Malaria

For inpatient treatment, national malaria treatment protocol should be followed. In case of fever, in endemic areas and for patients from endemic areas, if laboratory capacity for malaria microscopy or Rapid Diagnostic Test is available at the Stabilisation Centre / Hospital, all severe acute malnourished patient should be tested for malaria. Treat positive cases according to the national guidelines for Vivax malaria and Falciparum malaria respectively.

Dosage of Chloroquine/ Primaquine for confirmed Plasmodium vivax

	Dose*			
	Age less than 12 months**		**Age 12-59 months**	
Day	**Chloroquine (tablet 150mg)**	**Primaquine (tablet 7.5 mg)**	**Chloroquine (tablet 150mg)**	**Primaquine (tablet 7.5 mg)**
1	½ tablet	nil	1 tablet	½ tablet
2	½ tablet	nil	1 tablet	½ tablet
3	½ tablet	nil	½ tablet	½ tablet
				½ tablet
				½ tablet

* Chloroquine syrup should not be administered on empty stomach;
Repeat dose if there is vomiting within half an hour of Chloroquine administration
** Primaquine is not given to children below 1 year of age and pregnant women

Dosage of Sulphadoxine-pyremethamine for confirmed Plasmodium falciparum

Weight (Kg)	**Age**	**Single Dose (tablet 500 mg Sulphadoxine plus 25 mg Pyremethamine)**	**Single Dose (tablet 7.5mg) Primaquine***
5-10	2-11 months	½ tablet	
10.1-14	1-2 years	¾ tablet	1 tablet
14.1 20.0	3-5 years	1 tablet	2 tablet

* Primaquine is not given to children below 1 year of age and pregnant women; the dosis is given as a gametocytocidal after schizontocidal treatment

If Sulfadoxine-pyrimethamine is administered no folic acid should be given within 7 days of administration, because of its antagonistic affect on drug effectiveness. All children should be watched carefully for the next 48 hours, as resistance is an increasing problem all over the country.

In high Plasmodium prevalent districts Artemisinin-based combination therapy (ACT) with artemether-lumefantrine - Coartem® is given as first line treatment in patients whose body weight is higher than 10 kg. The dosage of Coartem® is 8/48 mg/kg body weight, in 6 doses divided over 3 days.

Sulfadoxine-pyrimethamine will be phased out and completely replaced by Coartem®.

Dosage of Artemether-Lumefantrine for confirmed Plasmodium falciparum

Weight (Kg)	**Age***	**Dose (for three days) (tablet 20 mg Arthemether plus 120 mg Lumefantrine)**	
		Morning	**Evening**
10 - 15	1-2 years	1 tablet	1 tablet
15 - 20	3-5 years	2 tablet	2 tablet

*Children aged 2-11 months and/or weighing less than 10 kg should not be treated with Coartem. However, they should also not be treated with intravenous quinine since this is not safe in severe malnutrition, so either oral or intra-muscular administration should be practiced.

Where no tests are available systematic treatment of suspected malaria is given for all patients with fever and other symptoms of malaria, according to the national guideline for suspected malaria. Monitor the child closely for first 48 hours, and if fever condition does not improve, immediately refer to the nearest facility where Plasmodium falciparum can be diagnosed.

If there is no response to malaria treatment or complications arise, refer to the national malaria treatment protocol for further treatment.[24]

Measles

All children from 6 months and older should be given measles vaccine on admission.

Children aged less than 9 months at admission should be given a second measles vaccination on discharge after completing 9 months of age.

Treatment of complications

PLEASE REFER TO WHO PROTOCOL FOR TREATMENT OF SEVERE ACUTE MALNUTRTION

Especially for:

- Shock from dehydration
- Shock from sepsis
- Severe anaemia

24 An intravenous infusion of Quinine is not safe in severe malnutrition

Monitoring at Stabilisation Centre (SC)

- Weight is measured each day.
- The degree of oedema (0 to +++) is assessed each day.
- Body temperature is measured twice per day.
- The standard clinical signs (stool, vomiting, dehydration, cough, respiration, liver size, etc.) are noted each day.
- MUAC is taken each week.
- Length or Height is taken after 21 days
- A record is taken if the patient is absent, vomits or refuses a feed, and whether the patient is fed by naso-gastric tube or is given I-V infusion or transfusion. This information is collected for each feed, each day.

Transition phase for discharge to OTP

As soon as the medical condition of the patient is stabilised and the complications are resolving, the transition phase is started. For transfer to OTP, transition is started by feeding the child RUTF at alternate feeds. If the child refuses the RUTF, the carer is encouraged to try to get the child to start eating at every other milk feeding. In the meantime, F75 is continued until appetite returns.

To test and confirm the complete recovery of appetite of a child, the child should be able to eat at least three quarter of his/her RUTF ration at each meal in a day. The child can then be referred to the OTP for continuation of the treatment at home, with RUTF.

Discharge criteria from SC to OTP[25]

- Appetite returns – child eats >75% of RUTF daily ration
- No medical complications
- Oedema is resolving

Follow-up after discharge from SC

Children are followed up for rehabilitation in the OTP closest to their home. Caretakers should get clear instruction and counselling why it is important to get admission at OTP after discharge from SC.

A referral slip specifying the treatment provided in SC should be given to facilitate admission and proper follow-up at HF-based OTP.

A MAM child discharged from the SC is classified as cured and returns home where the FCHV provides nutrition counselling to the care taker.

25 Children <6 months old admitted into SC should be treated in in-patient care following WHO protocols till complete recovery, meaning until satisfactory suckling and sufficient breast milk production is observed leading to appropriate daily weight gain and the child is clinically well and alert. Appropriate weight gain for an infant under 6 months means a minimum of 20g per day gained due to breastfeeding alone over a period of 5 consecutive days.

De-worming

Upon discharge from SC all children are given a single dose of Albendazole.

Dosage of Albendazole

Age	**<1 year**	**1 to 2 years**	**>= 2years**
Albendazole	Do not use	200 mg	400 mg

Take-home ration of RUTF to bridge the referral gap till admission in OTP

On discharge from SC give enough RUTF ration for one week (to last until the next OTP appointment). Provide the caretaker with key messages on use of RUTF and hygiene as specified in the OTP protocol (page 8).

DISCHARGE CRITERIA

From SC to OTP:

- Appetite returns – child eats >75% of RUTF daily ration
- No medical complications
- Oedema is resolving

From OTP

- MUAC > 11.5 cm,
- No bilateral pitting oedema
- Clinically well
- 15% weight gain as compared to admission weight

Other Discharges

Category of Discharge	In OTP	In SC
Defaulter	Absent for 3 consecutive consultations, (or two consultations if follow-up visits are every 2 weeks)	Absent from SC for 2 days
Death	Died while in OTP	Died while in SC
Non-responder	Has not reached discharge criteria within 3 months	
Transfer	To SC	
Medical transfer	Referred elsewhere for medical care and nutrition; treatment is not provided by the programme	

Where possible, VHW, MCHW and FCHV should trace those patients that default and need to be followed up. This is to encourage defaulters to return and complete treatment, but also to find out what are the reasons for defaulting and if there is anything that needs to be changed in the programme to prevent defaulting. The names and addresses of the defaulters can be obtained from the register.

MONITORING AND EVALUATION

The following indicators are used to measure the performance of the programme.

Data collection is performed through registration and reporting from community and health facility level. Complicated calculations can be performed at the district level, or health facilities with computer facilities.

Proportion of exits

Each month the numbers of cured patients, deaths, defaulters and transfers (referrals) are expressed as percentages of the total number of patients leaving the programme during the reporting month.

Exits	Exit = Patients leaving the programme; whether discharged and recovered, or due to death, defaulting, or transfers to other (higher level) treatment facilities
Recovery rate	Recovery rate = No of children successfully discharged (recovered) / No of exits
Death rate	Death rate = No of deaths in the programme / No of exits
Defaulter rate	Defaulter rate = No of defaulters / No of exits
Transfer rate	Transfer rate = No of transferred / No of exits
False admissions	Case admitted above MUAC and WFH criteria

Mean length of stay

This indicator should be calculated for ONLY the recovered patients for each category.

Mean length of stay =

Sum of (Number of days for each recovered patient) / Number of recovered patients

Mean rate of weight gain

Average weight gain is calculated for all RECOVERED patients for each patient category (OTP / SC, sex groups). Calculation is performed in three steps:

1. *Individual Total weight gain = discharge weight(g) – admission weight(g)*

2. Individual Weight gain in g/kg/d =

$$\frac{\textit{Individual total weight gain (g)}}{\textit{admission weight (kg) x no of days between date of minimum weight and discharge day}}$$

3. Average rate of weight gain is then:

Average weight gain (g/kg/day) =

$$\frac{\textit{Total sum of individual weight gains}}{\textit{Total No of individuals}}$$

To facilitate the calculation and speed up data processing a simple programme can be written in Excel. If the above mentioned monitoring data are entered into the computer then it is simple to calculate the length of stay and rate of weight gain.

Minimum performance standards

Programme data is compared to monitoring indicators developed by the Sphere project.

Reference values for the main indicators ©Sphere project

	Acceptable	**Alarming**
Recovery rate	> 75%	< 50%
Death rate	< 10%	> 15%
Defaulter rate	< 15%	> 25%
Coverage	> 50-70%	< 40%

Standardised recording and reporting formats

Standardised recording and reporting formats will be developed in line with this protocol by the Nutrition Section (MOHP), in consultation with pilot implementing partners during preparation of the implementation, and should be used for programme monitoring and reporting.

Standardised patient cards and tally sheets will be developed accordingly.

(To be attached as Annexes, once developed and tested within pilot programme)

ANNEXES

1. Medical complications
2. Supplemental medicines
3. Medical equipment and supplies
4. Community Mobilisation
5. Energy and Protein Intake for Out-Patient Treatment
6. Ready to Use Therapeutic Food
7. Comparison of Nutrient Content
8. Appetite Test
9. Checking for Bilateral Oedema
10. WHO – W/H table
11. 15% Weight gain table

MEDICAL COMPLICATIONS

Factor	Medical Complications requiring In-patient Care
Age	Child younger than 6 months
Oedema	Bilateral pitting oedema Grade 3 (+++) OR Marasmic kwashiorkor (W/H< -3SD / MUAC <11.5 cm AND oedema + or ++) OR Increasing or development of oedema
Appetite	No appetite or unable to eat
Medical complications	
Vomiting	Intractable (empties contents of stomach)
Temperature	Fever > 101 °F (38.5°C) under arm pit; (39°C rectal) Hypothermia < 95 °F (35°C) under arm pit; (35.5°C rectal)
Respiration rate	≥ 50 resp/min from 6 to 12 months ≥ 40 resp/min from 1 to 5 years ≥ 30 resp/min for over 5 year olds Any chest in-drawing (for children > 6 months)
Anaemia	Very pale (sever palmar pallor), difficulty breathing
Superficial infection	Extensive skin infection requiring Intra Muscular injection treatment and follow-up monitoring
Alertness	Very weak, apathetic, unconscious Fitting/convulsions
Hydration status	Severe dehydration based primarily on recent history of diarrhoea, vomiting, fever, anuria, thirst, sweating & clinical signs
Weight changes	Weight loss for 3 consecutive weighings (2 consecutive weighings for 2 weekly follow-up) Static weight for 5 consecutive weighings (3 consecutive weighings for 2 weekly follow-up)
General	Other general signs the health worker thinks warrants referral
Non response	Not recovered after 3 months in OTP and repeated home visits; should be examined in SC to investigate causes

SUPPLEMENTAL MEDICINES FOR OTP

Medicine	Use	Specification	Prescription	Special Instructions
Chloramphenicol syrup or tablets (second line antibiotic for non-response)		Capsules 250 mg Syrup 125mg/5ml	See SC protocol	Continue for 7 days
Metronidazole	Bloody diarrhoea, longer than 7 days	Syrup 100mg/5ml and 200 mg/5ml	Dose 20-30 mg/kg/day*	Continue for 5 days
Tetracycline eye ointment	Eye infection		Apply 3 times per day	Wash eyes before application Continue for 2 days after infection has gone
Clotrimazole	Candida	Mouth paint	Candida	Continue for 7 days
Paracetamol	Fever over 101ºF (38.5ºC) (1 dose only)	Syrup 125 mg/5ml	Lower doses according to weight than for IMCI**	Single doses only – do NOT give to take home[26]
Benzyl benzoate	Scabies	Lotion 25%; 200ml	Apply over whole body below neck; repeat without bathing following 3 days. Wash off 24 hours later.	Avoid eye contact. Do not use on broken or secondary infected skin.
Whitfields or zinc ointment	Ringworm and other fungal infection	Ointment	Apply twice a day	Continue treatment until condition has completely resolved
Gentian violet	Minor abrasions or fungal infections	1% watery solution	Apply on lesion	Can be repeated at next visit and continued until condition is resolved
Betadine solution	Disinfection		Apply on lesion	
Sugar (to make sugared water 10% dilution)	Hypoglycaemia	10 g sugar in 100 ml drinking water	50 ml to all children refusing RUTF	All children referred to SC (before leaving); if possible all children waiting for OTP

[26] Patients with fever over 101.3ºF /38.5 ºC (axillary) should be referred to hospital or stabilisation centre; the single doses should be given at health facility before transfer.

Medicine	Use	Specification	Prescription	Special Instructions
Ferrous Sulphate/Folate	Moderate anaemia according to IMCI guidelines		According to WHO protocols (INACG 1998)	ONLY to be given after 14 days in the programme
Second line anti-malarial	For non-response to first line treatment		According to national malaria treatment protocol	Do NOT give Intravenous infusion of Quinine to severely malnourished children

***Metronidazole dosages**

Syrup: 125 mg / 5 ml	
< 4.0 kg	Do not give
4.0 – 7.9 kg	62.5 mg (2.5 ml) *tid*
8.0 – 15.0 kg	125 mg (5 ml) *tid*
> 15.0 kg	250 mg (10 ml) *tid*

****Paracetamol dosages**

Syrup: 125 mg / 5 ml	
< 4.0 kg	25 mg (1 ml) *stat*
4.0 – 7.9 kg	62.5 mg (2.5 ml) *stat*
8.0 – 15.0 kg	125 mg (5 ml) *stat*
> 15.0 kg	250 mg (10 ml) *stat*

Medical Equipment required at OTP facility

Medical Equipment / Supply	Use	Specification	Number
Thermometer	Hypothermia	Low Reading	3
MUAC tapes	Nutritional status assessment	Cut-off at 115 and 125 mm	10
Salter scale	Weight measurement	(25 kg, 100 g) plus pants	2
Height board	Length/height measurement		1
Weight for Height Z-score table	Nutrition assessment	laminated	1
% weight gain table	Nutrition assessment	laminated	1
OTP cards			100
Marker pens			3
Medicine slips	To dispense medicines to be taken home	Symbols to indicate proper dosage	100
Bucket with lid	Water for washing		2
Soap	Hand washing		1
Nail clippers			1
Hand towels / paper towels			2
Examination gloves			100
Plastic cups	Serving sugar solution		10
Small spoons	Serving sugar solution		10
Water jug with lid	Sugar solution		2
Water purification tablets, or water guard	For drinking water		100
Jerry can	For water		1
Gauze 10 x 10			20
Small bandage			10
Tape			2 rolls
Dressing scissors			2 pairs
Normal saline for wounds	100 or 200 ml		10
Cotton wool			5 rolls
Mortar and pestle		To crush tables	1

COMMUNITY MOBILISATION

Community mobilisation is a range of non-clinical activities that are carried out in the catchment area of the health facility (SHP, HP, or PHC).

The two main objectives are:

- to ensure that the maximum possible number of severely malnourished children access treatment (achieve good programme coverage),
- to increase community awareness on malnutrition.

Initiating community mobilisation encompasses discussions held with key people in the community to give orientation on the nutrition, malnutrition, and the CMAM programme. This may be through having group discussions with key people or through more informal channels (e.g. informal one-to-one conversations). Through these discussions community organisations and community groups that can be agents for community sensitisation and awareness raising can be identified.

Working with these community agents the awareness on the importance of nutrition, causes of malnutrition, and other determinants of nutrition status can be created. The CMAM programme and the treatment they can expect can be explained and promoted to the community members. Once the people understand the programme, they can spread the message and mothers will know about the opportunities how and where to seek treatment for their malnourished child.

Key messages to disseminate are:

- Describe the physical characteristics of target children
- Announce the location and schedule of programme activities (screening and treatment)

Subsequently, community volunteers (from CBOs), if feasible in collaboration with Female Community Health Volunteers (FCHVs), are mobilised to perform screening of children under five during group meetings to actively identify SAM cases among their members' children.

FCHVs can screen children during their regular community work. This can be either when children come to the Female Community Health Volunteer for other issues, or by going house-to-house. Once mothers come to know about the service and are worried their child is malnourished, they may come to the FCHV specifically for screening.

Screening is simple and involves two things:

- Taking the MUAC
- Checking for bilateral pitting oedema

If the child meets the admission criteria for either MUAC or oedema they can be referred to the nearest OTP centre ((Sub) Health Post / Primary Health Care centre) for further assessment and admission to the programme.♦

♦ Referral can also take place on the basis of danger signs for medical complications and a MUAC of 115-125 mm (yellow)

These activities are additional to regular health services like outreach clinics providing growth monitoring, as performed by VHW and MCHW, that should be enhanced with MUAC screening. These health workers play an important role in community sensitisation, screening and referral.

The joint community mobilisation and screening activities should disseminate the messages necessary to eventually ensure maximum coverage by:

- ensuring that mothers/carers know if their child is severely malnourished and what to do if he/she is malnourished
- Female Community Health Volunteers working in the community make sure they screen for severely malnourished cases

Where possible, VHW, MCHW and FCHV can trace those patients that default and need to be followed up. This is to encourage defaulters to return and complete treatment, but also to find out what are the reasons for defaulting and if there is anything that needs to be changed in the programme to prevent defaulting. The names of the defaulters can be obtained from the register.

For example, if mothers face large distance or time pressures, the day of the OTP consultation at the health facility could be planned according to other activities in the area like a market day when mothers are in the vicinity anyway.

ENERGY AND PROTEIN INTAKE FOR OUT-PATIENT TREATMENT

Literature References

1. Energy and protein requirements. Report of a Joint FAO/WHO/UNU Expert Consultation. Technical Report Series. 724. WHO, Geneva. 1985. (http://www.fao.org/DOCREP/003/AA040E/AA040E07.htm#ch6.3)
2. Management of severe malnutrition: a manual for physicians and other senior health workers. WHO, Geneva, 1999 (ISBN 92 4 154511 9)
3. MSF Nutrition guidelines

Energy Requirements for Rehabilitation

Energy requirements for healthy children:

Ref 1, page 91 - Average energy requirements for children aged 1 to 5 years is 100 kcal/kg/day

Ref 1, page 143 - Children need 5 kcal per gram of tissue laid down

Energy requirements for children recovering from severe malnutrition:

Ref 2, page 21 - WHO recommends between 150 and 220 kcal/kg/day

Ref 3, page 85 - MSF recommends a minimum of 200 kcal/day

Justification:

Ref 2, page 22 – WHO states children usually gain 10-15 g/kg/day

Ref 3, page 150 – MSF recommends 10-20 g/kg day weight gain

At a rate of 5 kcal per gram tissue lay-down:

- 10g/kg/day means a child would need an extra 50 kcal/kg
- 15g/kg/day means a child would need an extra 75 kcal/kg
- 20g/kg/day means a child would need an extra 100kcal/kg

This amount added onto the 100kcal/kg/day energy requirement for healthy children means 150 - 200 kcal/kg/day for children in rehabilitation.

There is a margin for sharing, wastage etc. included in the overall recommendation of 150-220 kcal/kg/day.

The WHO protocol states that if children's intake is less than 130 kcal/kg/day the child is failing to respond.

Protein Requirements for Rehabilitation

Ref 1, page 104 – Protein requirements for health growing children 1.13 gram protein /kg/day

Ref 1, page 143 – Children need 0.23 gram of protein per gram tissue laid down

In relation to targeted weight gain this means:

- 10g/kg/day requires 2.3 g/kg (total requirement of 3.43g)
- 15g/kg/day requires 3.45 g/kg (total requirement 4.58g)
- 20g/kg/day requires 4.6 g/kg (total requirement 5.73g)

Ref 3, page 85 - MSF mentions protein requirement is 5g protein /kg/day

10% of energy should be protein calories: 10% of 200 kcal is 20 kcal; 1g protein gives 4 kcal, therefore 20 kcal is 5g of protein.

The recommendation of 10% protein-energy ratio is given in the 1985 Joint report (Ref 1).

Ref 2, WHO protocol of 150 kcal/kg using F100 therapeutic milk gives 3.75 g protein; 220 kcal/kg gives 5.5 g.

Amount of RUTF to feed based on energy and protein recommendations

Plumpy'Nut® 92 gm (1 sachet) of PN has 500Kcal (average amount to feed: 200kcal/kg/day)				
Weight of child (kg)			**Ration per week (No of Sachets)**	**Ration per day (No of sachets)**	**Consumption per day (No of sachets)**
3.5	**-**	**3.9**	14	**2**	**1.5**
4	**-**	**5.4**	14	**2**	**2**
5.5	**-**	**6.9**	21	**3**	**2.5**
7	**-**	**8.4**	21	**3**	**3**
8.5	**-**	**9.4**	28	**4**	**3.5**
9.5	**-**	**10.4**	28	**4**	**4**
10.5	**-**	**11.9**	35	**5**	**4.5**
> 12			35	**5**	**5**
Give small amount every 3 hours (day and night), with water to drink					

READY TO USE THERAPEUTIC FOOD

Ready-to-Use Therapeutic Food (RUTF) is an energy dense mineral/vitamin enriched food nutritionally equivalent to F100, which is recommended by the WHO for the treatment of malnutrition[27]. It is oil-based with low water activity; thus it is microbiologically safe and can be kept for months in simple packaging. Therefore, with proper hygiene instruction, RUTF can be safely used for outpatient treatment of Severe Acute Malnutrition. As it is eaten uncooked, it is an ideal vehicle to deliver many micronutrients that might otherwise be broken down by cooking. Studies have shown that severely malnourished children given RUTF had a faster rate of recovery than those given F-100[28].

While RUTF is a generic name, Plumpy'nut® is the trademark name for the manufactured product from the French company, Nutriset[29].

General Description:
Ready-to-Use Therapeutic Food, in individual sachets of 92 grams. (Plumpy'Nut®)

Composition:
Vegetable fat, peanut butter, skimmed milk powder, lactoserum, maltodextrin, sugar, mineral and vitamin complex.
1 sachet = 92 grams of product = 500 kcal.

Nutritional value per 100g of product:	
Energy: 545 kcal	
Proteins: 13.6 g = 10% protidic calories Lipides: 35.7 g = 59% lipidic calories (Thus by deduction: 31% carbohydratic calories = 42.2 g carbohydrates)	
Vitamins:	**Minerals:**
Vitamin A: 910 micrograms Vitamin D: 16 micrograms Vitamin E: 20 mg Vitamin C: 53 mg Vitamin B1: 0.6 mg Vitamin B2: 1.8 mg Vitamin B6: 0.6 mg Vitamin B12: 1.8 microgram Vitamin K: 21 microgram Biotin: 65 microgram Folic acid: 210 microgram Pantothenic acid: 3.1 mg Niacin: 5.3 mg	Calcium: 320 mg Phosphorus: 394 mg Potassium: 1111 mg Magnesium: 92 mg Zinc: 14 mg Copper: 1.78 mg Iron: 11.53 mg Iodin: 110 microgram Sodium: <290 mg Selenium: 30 microgram

[27] WHO 1999 'Management of severe malnutrition; a manual for physicians and other senior health workers'.

[28] Diop EHI, Dossou, NI, Ndour MM, Briend A, and Wade S (2003): Comparison of the efficacy of a solid ready-to-use food and a liquid, milk-based diet for the rehabilitation of severely malnourished children: a randomised trial. Am J Clin Nutr 2003; 78:302-7

[29] The company producing other therapeutic supplies such as F-100 and F-75

Shelf life:
24 months from manufacturing date (under well ventilated storage conditions with maximum 40°C temperature; humidity has no impact)

Packaging and labelling:
Airtight sachet which includes an aluminium layer to protect against UV, light and humidity.

Local Production of RUTF

Since RUTF has to be imported, the costs are high. With this problem in mind, the development of locally produced RUTF has been commenced in some countries[30], in order to try to ensure a cheaper and more sustainable supply of the product.

As peanut-based recipes require unfortified milk powder, which often has to be imported, and the peanuts can be prone to aflatoxin contamination, which complicates quality assurance, investigations into alternative recipes eliminating the use of both peanuts and milk are underway. Such investigations are ongoing in Bangladesh but as the recipes have not been fully developed, there is currently no locally available RUTF for Asia.

[30] Mainly on the African continent

COMPARISON OF NUTRIENT CONTENT

Below table shows the comparability of F-100 Therapeutic Milk with Plumpy'Nut®

Nutritional value		
Plumpy'Nut® (100 grams)	F-100 (100 g dry product)	F-75 (100 g dry product)
Energy: **545** kcal	Energy: **520** kcal	Energy: **446** kcal
Proteins: 10% calories	Proteins: 10% calories	Proteins: 5% calories
Lipids: 59% calories	Lipids: 45% calories	Lipids: 31% calories
Thus by deduction: Carbohydrates 31%	Thus by deduction: Carbohydrates 45%	Thus by deduction: Carbohydrates 64%
Vitamin A: 910 µg Vitamin D: 16 µg Vitamin E: 20 mg Vitamin C: 53 mg Vitamin B1: 0.6 mg Vitamin B2: 1.8 mg Vitamin B6: 0.6 mg Vitamin B12: 1.8 µg Vitamin K: 21 µg Biotin: 65 µg Folic acid: 210 µg Pantothenic acid: 3.1 mg Niacin: 5.3 mg	Vitamin A: 800 µg Vitamin D: 15 µg Vitamin E: 20 mg Vitamin C: 50 mg Vitamin B1: 0.5 mg Vitamin B2: 1.6 mg Vitamin B6: 0.6 mg Vitamin B12: 1.6 µg Vitamin K: 15 µg Biotin: 60 µg Folic acid: 200 µg Pantothenic acid: 5.8 mg Niacin: 5 mg	Vitamin A: 900 µg Vitamin D: 18 µg Vitamin E: 20 mg Vitamin C: 59 mg Vitamin B1: 0.5 mg Vitamin B2: 1.2 mg Vitamin B6: 0.6 mg Vitamin B12: 1.6 µg Vitamin K: 24 µg Biotin: 60 µg Folic acid: 200 µg Pantothenic acid: 3 mg Niacin: 5 mg
Calcium: 320 mg Phosphorus: 394 mg Potassium: 1111 mg Magnesium: 92 mg Zinc: 14 mg Copper: 1.78 mg Iron: 11.53 mg Iodin: 110 µg Sodium: <290 mg Selenium: 30 µg	Calcium: 300 mg Phosphorus: 300 mg Potassium: 1100 mg Magnesium: 80 mg Zinc: 11 mg Copper: 1.4 mg Iron: <0.2 mg Iodin: 70 µg Sodium: <290 mg Selenium: 20 µg	Calcium: 560 mg Phosphorus: 330 mg Potassium: 775 mg Magnesium: 50 mg Zinc: 12.2 mg Copper: 1.7 mg Iron: <0.3 mg Iodin: 100 µg Sodium: <87 mg Selenium: 30 µg

THE APPETITE TEST

Why do the appetite test?

- Malnutrition changes the way infections and other diseases express themselves – children severely affected by the classical IMCI diseases, who are malnourished, frequently show no signs of these diseases. However, the major complications lead to a loss of appetite. Therefore, an important criterion to decide if a patient should be sent to in- or out- patient management is the Appetite Test. A poor appetite means that the child has a significant infection or a major metabolic abnormality such as liver dysfunction, electrolyte imbalance, cell membrane damage or damaged biochemical pathways. These are the patients at immediate risk of death.
- Furthermore, a child with a poor appetite will not take the diet at home and will continue to deteriorate or die.

How to do the appetite test

1. The appetite test should be conducted in a separate quiet area.
2. Explain to the carer the purpose of the appetite test and how it will be carried out.
3. The carer, where possible, should wash her hands.
4. The carer should sit comfortably with the child on her lap and either offer the RUTF from the packet or put a small amount on her finger and give it to the child.
5. The carer should offer the child the RUTF gently, encouraging the child all the time. If the child refuses then the carer 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.
6. 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 3-4 mouth full of RUTF, or the equivalent of ¼ of a sachet

Fail

A child that does not take at least 3-4 mouth full of RUTF is considered to lack sufficient appetite for outpatient treatment and should be referred to hospital for in-patient care.

- Even if the caretaker/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. After showing sufficient appetite in inpatient care, they can be transferred to the out-patient treatment.

- The appetite test should always be performed carefully. If there is any doubt concerning the appetite then the patient should be referred for in-patient treatment until the appetite returns.
- The appetite test is to ensure that - in the course of a day - the patient will take at least the amount that will maintain body weight. A patient should not be sent home if there is a risk they will continue to deteriorate because they will not take sufficient Therapeutic food.
- Sometimes a child will not eat the RUTF because he is frightened, distressed or fearful of the environment or staff. Common stress factors are crowds, a lot of noise, other distressed children or intimidating health professionals with white coats or harsh tone of voice. Therefore, the appetite test should be conducted a separate quiet area. If a quiet area is not available in the health facility then the appetite can be tested outside.

Follow-up

- Discuss appetite and perform RUTF appetite test if there seem to be problems: the caretaker did not bring all empty sachets back; or he/she tells that the child is not eating well, or does not like the RUTF; or the child is not gaining weight.
- Failure of an appetite test at any time is an indication for full evaluation of the health and nutrition condition of the child and probably for transfer to in-patient assessment and treatment.
- During the second and subsequent visits the intake during appetite test should be good, thus without much persuasion more than ¼ of a sachet, if the patient is to recover reasonably quickly.
- If the appetite is “good” during the appetite test and the rate of weight gain at home is poor then a home visit should be arranged, if feasible, to gain understanding of the reasons for failure to respond. It may then be necessary to bring a child into in-patient care to do a simple “trial of feeding” to differentiate i) a metabolic problem with the patient from ii) a difficulty with the home environment; such a trial-of-feeding, in a structured environment (e.g. Stabilisation Centre), is also the first step in investigating failure to respond to treatment.

CHECKING FOR BILATERAL OEDEMA

Bilateral oedema is the sign of Kwashiorkor. Kwashiorkor is *always* a severe form of malnutrition. While lesser degrees of oedema can be effectively treated in OTP care, children with generalised, third degree oedema are at high risk of mortality and need to be treated in a stabilisation centre urgently.

In order to determine the presence of oedema, normal thumb pressure is applied to the both feet for three seconds. If a shallow print persists on both feet, then the child presents oedema. Only children with bilateral oedema are recorded as having nutritional oedema.

Degrees of oedema

Severity	**Where**	**What**
Mild (+)	Usually confined to both feet and pre-tibia	Pit stays for 3 seconds
Moderate (++)	On both feet and legs	Intermediate
Severe (+++)	Whole body, legs, hands, and eyes (moonface)	Pit is deep and stays for 3 minutes or more

- If the pit is shallow and fills in within about 3 seconds then oedema is mild (+)
- If the pressing finger sinks into the pit and then the pit remains for several minutes it is severe (+++)
- Moderate is in between

WHO – WEIGHT FOR LENGTH / HEIGHT TABLE

WHO Child Growth Standards 2006 Weigth for Length (6-24 months) (up to 87 cm)								
GIRLS				(recumbant)	BOYS			
weight (kg)	weight (kg)	weight (kg)	weight (kg)	length (cm)	weight (kg)	weight (kg)	weight (kg)	weight (kg)
"-3 SD"	"-2 SD"	"-1 SD"	median		median	"-1 SD"	"-2 SD"	"-3 SD"
3.0	3.3	3.6	3.9	52.5	3.9	3.6	3.3	3.0
3.1	3.4	3.7	4.0	53.0	4.0	3.7	3.4	3.1
3.2	3.5	3.8	4.2	53.5	4.1	3.8	3.5	3.2
3.3	3.6	3.9	4.3	54.0	4.3	3.9	3.6	3.3
3.4	3.7	4.0	4.4	54.5	4.4	4.0	3.7	3.4
3.5	3.8	4.2	4.5	55.0	4.5	4.2	3.8	3.6
3.6	3.9	4.3	4.7	55.5	4.7	4.3	4.0	3.7
3.7	4.0	4.4	4.8	56.0	4.8	4.4	4.1	3.8
3.8	4.1	4.5	5.0	56.5	5.0	4.6	4.2	3.9
3.9	4.3	4.6	5.1	57.0	5.1	4.7	4.3	4.0
4.0	4.4	4.8	5.2	57.5	5.3	4.9	4.5	4.1
4.1	4.5	4.9	5.4	58.0	5.4	5.0	4.6	4.3
4.2	4.0	5.0	5.5	58.5	5.6	5.1	4.7	4.4
4.3	4.7	5.1	5.6	59.0	5.7	5.3	4.8	4.5
4.4	4.8	5.3	5.7	59.5	5.9	5.4	5.0	4.6
4.5	4.9	5.4	5.9	60.0	6.0	5.5	5.1	4.7
4.6	5.0	5.5	6.0	60.5	6.1	5.6	5.2	4.8
4.7	5.1	5.6	6.1	61.0	6.3	5.8	5.3	4.9
4.8	5.2	5.7	6.3	61.5	6.4	5.9	5.4	5.0
4.9	5.3	5.8	6.4	62.0	6.5	6.0	5.6	5.1
5.0	5.4	5.9	6.5	62.5	6.7	6.1	5.7	5.2
5.1	5.5	6.0	6.6	63.0	6.8	6.2	5.8	5.3
5.2	5.6	6.2	6.7	63.5	6.9	6.4	5.9	5.4
5.3	5.7	6.3	6.9	64.0	7.0	6.5	6.0	5.5
5.4	5.8	6.4	7.0	64.5	7.1	6.6	6.1	5.6
5.5	5.9	6.5	7.1	65.0	7.3	6.7	6.2	5.7
5.5	6.0	6.6	7.2	65.5	7.4	6.8	6.3	5.8
5.6	6.1	6.7	7.3	66.0	7.5	6.9	6.4	5.9
5.7	6.2	6.8	7.4	66.5	7.6	7.0	6.5	6.0
5.8	6.3	6.9	7.5	67.0	7.7	7.1	6.6	6.1
5.9	6.4	7.0	7.6	67.5	7.9	7.2	6.7	6.2
6.0	6.5	7.1	7.7	68.0	8.0	7.3	6.8	6.3
6.1	6.6	7.2	7.9	68.5	8.1	7.5	6.9	6.4
6.1	6.7	7.3	8.0	69.0	8.2	7.6	7.0	6.5
6.2	6.8	7.4	8.1	69.5	8.3	7.7	7.1	6.6
6.3	6.9	7.5	8.2	70.0	8.4	7.8	7.2	6.6
6.4	6.9	7.6	8.3	70.5	8.5	7.9	7.3	6.7
6.5	7.0	7.7	8.4	71.0	8.6	8.0	7.4	6.8
6.5	7.1	7.7	8.5	71.5	8.8	8.1	7.5	6.9
6.6	7.2	7.8	8.6	72.0	8.9	8.2	7.6	7.0
6.7	7.3	7.9	8.7	72.5	9.0	8.3	7.6	7.1
6.8	7.4	8.0	8.8	73.0	9.1	8.4	7.7	7.2
6.9	7.4	8.1	8.9	73.5	9.2	8.5	7.8	7.2
6.9	7.5	8.2	9.0	74.0	9.3	8.6	7.9	7.3

GIRLS				(recumbant)	BOYS			
weight (kg)	weight (kg)	weight (kg)	weight (kg)	length (cm)	weight (kg)	weight (kg)	weight (kg)	weight (kg)
"-3 SD"	"-2 SD"	"-1 SD"	median		median	"-1 SD"	"-2 SD"	"-3 SD"
7.0	7.6	8.3	9.1	74.5	9.4	8.7	8.0	7.4
7.1	7.7	8.4	9.1	75.0	9.5	8.8	8.1	7.5
7.1	7.7	8.5	9.2	75.5	9.6	8.8	8.2	7.6
7.2	7.8	8.5	9.3	76.0	9.7	8.9	8.3	7.6
7.3	7.9	8.6	9.4	76.5	9.8	9.0	8.3	7.7
7.4	8.0	8.7	9.5	77.0	9.9	9.1	8.4	7.8
7.4	8.1	8.8	9.6	77.5	10.0	9.2	8.5	7.9
7.5	8.2	8.9	9.7	78.0	10.1	9.3	8.6	7.9
7.6	8.2	9.0	9.8	78.5	10.2	9.4	8.7	8.0
7.7	8.3	9.1	9.9	79.0	10.3	9.5	8.7	8.1
7.7	8.4	9.1	10.0	79.5	10.4	9.5	8.8	8.2
7.8	8.5	9.2	10.1	80.0	10.4	9.6	8.9	8.2
7.9	8.6	9.3	10.2	80.5	10.5	9.7	9.0	8.3
8.0	8.7	9.4	10.3	81.0	10.6	9.8	9.1	8.4
8.1	8.8	9.5	10.4	81.5	10.7	9.9	9.1	8.5
8.1	8.8	9.6	10.5	82.0	10.8	10.0	9.2	8.5
8.2	8.9	9.7	10.6	82.5	10.9	10.1	9.3	8.6
8.3	9.0	9.8	10.7	83.0	11.0	10.2	9.4	8.7
8.4	9.1	9.9	10.9	83.5	11.2	10.3	9.5	8.8
8.5	9.2	10.1	11.0	84.0	11.3	10.4	9.6	8.9
8.6	9.3	10.2	11.1	84.5	11.4	10.5	9.7	9.0
8.7	9.4	10.3	11.2	85.0	11.5	10.6	9.8	9.1
8.8	9.5	10.4	11.3	85.5	11.6	10.7	9.9	9.2
8.9	9.7	10.5	11.5	86.0	11.7	10.8	10.0	9.3
9.0	9.8	10.6	11.6	86.5	11.9	11.0	10.1	9.4
9.1	9.9	10.7	11.7	87.0	12.0	11.1	10.2	9.5
9.2	10.0	10.9	11.8	87.5	12.1	11.2	10.4	9.6
9.3	10.1	11.0	12.0	88.0	12.2	11.3	10.5	9.7
9.4	10.2	11.1	12.1	88.5	12.4	11.4	10.6	9.8
9.5	10.3	11.2	12.2	89.0	12.5	11.5	10.7	9.9
9.6	10.4	11.3	12.3	89.5	12.6	11.6	10.8	10.0
9.7	10.5	11.4	12.5	90.0	12.7	11.8	10.9	10.1
9.8	10.6	11.5	12.6	90.5	12.8	11.9	11.0	10.2
9.9	10.7	11.7	12.7	91.0	13.0	12.0	11.1	10.3
10.0	10.8	11.8	12.8	91.5	13.1	12.1	11.2	10.4
10.1	10.9	11.9	13.0	92.0	13.2	12.2	11.3	10.5
10.1	11.0	12.0	13.1	92.5	13.3	12.3	11.4	10.6
10.2	11.1	12.1	13.2	93.0	13.4	12.4	11.5	10.7
10.3	11.2	12.2	13.3	93.5	13.5	12.5	11.6	10.7
10.4	11.3	12.3	13.5	94.0	13.7	12.6	11.7	10.8
10.5	11.4	12.4	13.6	94.5	13.8	12.7	11.8	10.9
10.6	11.5	12.6	13.7	95.0	13.9	12.8	11.9	11.0
10.7	11.6	12.7	13.8	95.5	14.0	12.9	12.0	11.1
10.8	11.7	12.8	14.0	96.0	14.1	13.1	12.1	11.2
10.9	11.8	12.9	0.6	96.5	14.3	13.2	12.2	11.3
11.0	12.0	13.0	14.2	97.0	14.4	13.3	12.3	11.4
11.1	12.1	13.1	14.4	97.5	14.5	13.4	12.4	11.5
11.2	12.2	13.3	14.5	98.0	14.6	13.5	12.5	11.6
11.3	12.3	13.4	14.6	98.5	14.8	13.6	12.6	11.7

GIRLS				recumbant	BOYS			
weight (kg)	weight (kg)	weight (kg)	weight (kg)	length (cm)	weight (kg)	weight (kg)	weight (kg)	weight (kg)
"-3 SD"	"-2 SD"	"-1 SD"	median		median	"-1 SD"	"-2 SD"	"-3 SD"
11.4	12.4	13.5	14.8	99.0	14.9	13.7	12.7	11.8
11.5	12.5	13.6	14.9	99.5	15.0	13.9	12.8	11.9
11.6	12.6	13.7	15.0	100.0	15.2	14.0	12.9	12.0
11.7	12.7	13.9	15.2	100.5	15.3	14.1	13.0	12.1
11.8	12.8	14.0	15.3	101.0	15.4	14.2	13.2	12.2
11.9	13.0	14.1	15.5	101.5	15.6	14.4	13.3	12.3
12.0	13.1	14.3	15.6	102.0	15.7	14.5	13.4	12.4
12.1	13.2	14.4	15.8	102.5	15.9	14.6	13.5	12.5
12.3	13.3	14.5	15.9	103.0	16.0	14.8	13.6	12.6
12.4	13.5	14.7	16.1	103.5	16.2	14.9	13.7	12.7
12.5	13.6	14.8	16.2	104.0	16.3	15.0	13.9	12.8
12.6	13.7	15.0	16.4	104.5	16.5	15.2	14.0	12.9
12.7	13.8	15.1	16.5	105.0	16.6	15.3	14.1	13.0
12.8	14.0	15.3	16.7	105.5	16.8	15.4	14.2	13.2
13.0	14.1	15.4	16.9	106.0	16.9	15.6	14.4	13.3
13.1	14.3	15.6	17.1	106.5	17.1	15.7	14.5	13.4
13.2	14.4	15.7	17.2	107.0	17.3	15.9	14.6	13.5
13.3	14.5	15.9	17.4	107.5	17.4	16.0	14.7	13.6
13.5	14.7	16.0	17.6	108.0	17.6	16.2	14.9	13.7
13.6	14.8	16.2	17.8	108.5	17.8	16.3	15.0	13.8
13.7	15.0	16.4	18.0	109.0	17.9	16.5	15.1	14.0
13.9	15.1	16.5	18.1	109.5	18.1	16.6	15.3	14.1
14.0	15.3	16.7	18.3	110.0	18.3	16.8	15.4	14.2

WHO Child Growth Standards 2006 LENGTH

WHO Child Growth Standards 2006

Weight for Height

GIRLS					BOYS			
weight (kg)	weight (kg)	weight (kg)	weight (kg)	Height (cm)	weight (kg)	weight (kg)	weight (kg)	weight (kg)
"-3 SD"	"-2 SD"	"-1 SD"	median		median	"-1 SD"	"-2 SD"	"-3 SD"
9.2	10.0	10.9	11.9	87.0	12.2	11.2	10.4	9.6
9.3	10.1	11.0	12.0	87.5	12.3	11.3	10.5	9.7
9.4	10.2	11.1	12.1	88.0	12.4	11.5	10.6	9.8
9.5	10.3	11.2	12.3	88.5	12.5	11.6	10.7	9.9
9.6	10.4	11.4	12.4	89.0	12.6	11.7	10.8	10.0
9.7	10.5	11.5	12.5	89.5	12.8	11.8	10.9	10.1
9.8	10.6	11.6	12.6	90.0	12.9	11.9	11.0	10.2
9.9	10.7	11.7	12.8	90.5	13.0	12.0	11.1	10.3
10.0	10.9	11.8	12.9	91.0	13.1	12.1	11.2	10.4
10.1	11.0	11.9	13.0	91.5	13.2	12.2	11.3	10.5
10.2	11.1	12.0	13.1	92.0	13.4	12.3	11.4	10.6
10.3	11.2	12.1	13.3	92.5	13.5	12.4	11.5	10.7
10.4	11.3	12.3	13.4	93.0	13.6	12.6	11.6	10.8
10.5	11.4	12.4	13.5	93.5	13.7	12.7	11.7	10.9
10.6	11.5	12.5	13.6	94.0	13.8	12.8	11.8	11.0
10.7	11.6	12.6	13.8	94.5	13.9	12.9	11.9	11.1
10.8	11.7	12.7	13.9	95.0	14.1	13.0	12.0	11.1
10.8	11.8	12.8	14.0	95.5	14.2	13.1	12.1	11.2
10.9	11.9	12.9	14.1	96.0	14.3	13.2	12.2	11.3
11.0	12.0	13.1	14.3	96.5	14.4	13.3	12.3	11.4
11.1	12.1	13.2	14.4	97.0	14.6	13.4	12.4	11.5
11.2	12.2	13.3	14.5	97.5	14.7	13.6	12.5	11.6
11.3	12.3	13.4	14.7	98.0	14.8	13.7	12.6	11.7
11.4	12.4	13.5	14.8	98.5	14.9	13.8	12.8	11.8
11.5	12.5	13.7	14.9	99.0	15.0	13.9	12.9	11.9
11.6	12.7	13.8	15.1	99.5	15.1	14.0	13.0	12.0
11.7	12.8	13.9	15.2	100.0	15.2	14.2	13.1	12.1
11.9	12.9	14.1	15.4	100.5	15.4	14.3	13.2	12.2
12.0	13.0	14.2	15.5	101.0	15.5	14.4	13.3	12.3
12.1	13.1	14.3	15.7	101.5	15.6	14.5	13.4	12.4
12.2	13.3	14.5	15.8	102.0	15.8	14.7	13.6	12.5
12.3	13.4	14.6	16.0	102.5	15.9	14.8	13.7	12.6
12.4	13.5	14.7	16.1	103.0	16.1	14.9	13.8	12.8
12.5	13.6	14.9	16.3	103.5	16.2	15.1	13.9	12.9
12.6	13.8	15.0	16.4	104.0	16.4	15.2	14.0	13.0
12.8	13.9	15.2	16.6	104.5	16.5	15.4	14.2	13.1
12.9	14.0	15.3	16.8	105.0	16.7	15.5	14.3	13.2
13.0	14.2	15.5	16.9	105.5	16.8	15.6	14.4	13.3
13.1	14.3	15.6	17.1	106.0	17.0	15.8	14.5	13.4
13.3	14.5	15.8	17.3	106.5	17.2	15.9	14.7	13.5
13.4	14.6	15.9	17.5	107.0	17.3	16.1	14.8	13.7
13.5	14.7	16.1	17.7	107.5	17.5	16.2	14.9	13.8
13.7	14.9	16.3	17.8	108.0	17.7	16.4	15.1	13.9
13.8	15.0	16.4	18.0	108.5	17.8	16.5	15.2	14.0
13.9	15.2	16.6	18.2	109.0	18.0	16.7	15.3	14.1

GIRLS					BOYS			
weight (kg)	weight (kg)	weight (kg)	weight (kg)	Height (cm)	weight (kg)	weight (kg)	weight (kg)	weight (kg)
"-3 SD"	"-2 SD"	"-1 SD"	median		median	"-1 SD"	"-2 SD"	"-3 SD"
14.1	15.4	16.8	18.4	109.5	18.2	16.8	15.5	14.3
14.2	15.5	17.0	18.6	110.0	18.5	17.0	15.6	14.4
14.4	15.7	17.1	18.8	110.5	18.7	17.1	15.8	14.5
14.5	15.8	17.3	19.0	111.0	18.9	17.3	15.9	14.6
14.7	16.0	17.5	19.2	111.5	19.1	17.5	16.0	14.8
14.8	16.2	17.7	19.4	112.0	19.2	17.6	16.2	14.9
15.0	16.3	17.9	19.6	112.5	19.4	17.8	16.3	15.0
15.1	16.5	18.0	19.8	113.0	19.6	18.0	16.5	15.2
15.3	16.7	18.2	20.0	113.5	19.8	18.1	16.6	15.3
15.4	16.8	18.4	20.2	114.0	20.0	18.3	16.8	15.4
15.6	17.0	18.6	20.5	114.5	20.2	18.5	16.9	15.6
15.7	17.2	18.8	20.7	115.0	20.4	18.6	17.1	15.7
15.9	17.3	19.0	20.9	115.5	20.6	18.8	17.2	15.8
16.0	17.5	19.2	21.1	116.0	20.8	19.0	17.4	16.0
16.2	17.7	19.4	21.3	116.5	21.0	19.2	17.5	16.1
16.3	17.8	19.6	21.5	117.0	21.2	19.3	17.7	16.2
16.5	18.0	19.8	21.7	117.5	21.4	19.5	17.9	16.4
16.6	18.2	19.9	22.0	118.0	21.6	19.7	18.0	16.5
16.8	18.4	20.1	22.2	118.5	21.8	19.9	18.2	16.7
16.9	18.5	20.3	22.4	119.0	22.0	20.0	18.3	16.8
17.1	18.7	20.5	22.6	119.5	22.2	20.2	18.5	16.9
17.3	18.9	20.7	22.8	120.0	22.4	20.4	18.6	17.1

WHO Child Growth Standards 2006 HEIGHT

15% Weight Gain Table

ADMISSION Weight (kg)		MINIMUM DISCHARGE Weight (kg)		ADMISSION Weight (kg)		MINIMUM DISCHARGE Weight (kg)
3.0	⇨	3.5		6.9	⇨	7.9
3.1	⇨	3.6		7.0	⇨	8.1
3.2	⇨	3.7		7.1	⇨	8.2
3.3	⇨	3.8		7.2	⇨	8.3
3.4	⇨	3.9		7.3	⇨	8.4
3.5	⇨	4.0		7.4	⇨	8.5
3.6	⇨	4.1		7.5	⇨	8.6
3.7	⇨	4.3		7.6	⇨	8.7
3.8	⇨	4.4		7.7	⇨	8.9
3.9	⇨	4.5		7.8	⇨	9.0
4.0	⇨	4.6		7.9	⇨	9.1
4.1	⇨	4.7		8.0	⇨	9.2
4.2	⇨	4.8		8.1	⇨	9.3
4.3	⇨	4.9		8.2	⇨	9.4
4.4	⇨	5.1		8.3	⇨	9.5
4.5	⇨	5.2		8.4	⇨	9.7
4.6	⇨	5.3		8.5	⇨	9.8
4.7	⇨	5.4		8.6	⇨	9.9
4.8	⇨	5.5		8.7	⇨	10.0
4.9	⇨	5.6		8.8	⇨	10.1
5.0	⇨	5.8		8.9	⇨	10.2
5.1	⇨	5.9		9.0	⇨	10.4
5.2	⇨	6.0		9.1	⇨	10.5
5.3	⇨	6.1		9.2	⇨	10.6
5.4	⇨	6.2		9.3	⇨	10.7
5.5	⇨	6.3		9.4	⇨	10.8
5.6	⇨	6.4		9.5	⇨	10.9
5.7	⇨	6.6		9.6	⇨	11.0
5.8	⇨	6.7		9.7	⇨	11.2
5.9	⇨	6.8		9.8	⇨	11.3
6.0	⇨	6.9		9.9	⇨	11.4
6.1	⇨	7.0		10.0	⇨	11.5
6.2	⇨	7.1		10.1	⇨	11.6
6.3	⇨	7.2		10.2	⇨	11.7
6.4	⇨	7.4		10.3	⇨	11.8
6.5	⇨	7.5		10.4	⇨	12.0
6.6	⇨	7.6		10.5	⇨	12.1
6.7	⇨	7.7		10.6	⇨	12.2
6.8	⇨	7.8		10.7	⇨	12.3

15% Weight Gain Table (continued)

ADMISSION Weight (kg)		MINIMUM DISCHARGE Weight (kg)		ADMISSION Weight (kg)		MINIMUM DISCHARGE Weight (kg)
10.8	⇨	12.4		14.2	⇨	16.3
10.9	⇨	12.5		14.3	⇨	16.4
11.0	⇨	12.7		14.4	⇨	16.6
11.1	⇨	12.8		14.5	⇨	16.7
11.2	⇨	12.9		14.6	⇨	16.8
11.3	⇨	13.0		14.7	⇨	16.9
11.4	⇨	13.1		14.8	⇨	17.0
11.5	⇨	13.2		14.9	⇨	17.1
11.6	⇨	13.3		15.0	⇨	17.3
11.7	⇨	13.5		15.1	⇨	17.4
11.8	⇨	13.6		15.2	⇨	17.5
11.9	⇨	13.7		15.3	⇨	17.6
12.0	⇨	13.8		15.4	⇨	17.7
12.1	⇨	13.9		15.5	⇨	17.8
12.2	⇨	14.0		15.6	⇨	17.9
12.3	⇨	14.1		15.7	⇨	18.1
12.4	⇨	14.3		15.8	⇨	18.2
12.5	⇨	14.4		15.9	⇨	18.3
12.6	⇨	14.5		16.0	⇨	18.4
12.7	⇨	14.6		16.1	⇨	18.5
12.8	⇨	14.7		16.2	⇨	18.6
12.9	⇨	14.8		16.3	⇨	18.7
13.0	⇨	15.0		16.4	⇨	18.9
13.1	⇨	15.1		16.5	⇨	19.0
13.2	⇨	15.2		16.6	⇨	19.1
13.3	⇨	15.3		16.7	⇨	19.2
13.4	⇨	15.4		16.8	⇨	19.3
13.5	⇨	15.5		16.9	⇨	19.4
13.6	⇨	15.6		17.0	⇨	19.6
13.7	⇨	15.8		17.1	⇨	19.7
13.8	⇨	15.9		17.2	⇨	19.8
13.9	⇨	16.0		17.3	⇨	19.9
14.0	⇨	16.1		17.4	⇨	20.0
14.1	⇨	16.2		17.5	⇨	20.1

OTP instructions for Treatment of Children aged under 6 months and over 5 years

The CMAM programme is targeting children aged 6 months to 59 months.

The under-limit of the target group is determined by the fact that children less than 6 months of age have specific needs and can not yet digest the RUTF efficiently. Severely acutely malnourished children under the age of 6 months (weighing less than 3 kg) should therefore always be referred to the hospital or therapeutic feeding centre to receive specialised medical attention and nutrition treatment.

The upper-limit is determined by vulnerability criteria related to the age less than 5 years. There can be exceptional cases of extreme severe acute malnutrition in children over the age of 5 years that would warrant treatment. Therefore, children with increased vulnerability due to HIV/AIDS (either identified in the child or in the mother), which have elevated nutrition requirements, will be admitted for treatment if identified as severely acutely malnourished. Admission of such cases should always be reported to the overall CMAM programme managers.

OTP instruction for use of Multi-Micronutrient supplementation

The Nepal Ministry of Health has a new policy for the Multi-Micronutrient supplementation for children aged 6 to 24 months, to prevent anaemia and improve overall nutritional status. In 2009 the supplementation programme will be piloted in selected districted to try out the distribution process and relevant messages. Furthermore, under food insecurity crisis, the international protocol for emergencies recommends multi micronutrient supplementation for all children aged 6 to 59 months. A common name for the multi micronutrient powder that is used for this supplementation is “Sprinkles”.

Children under treatment for SAM following the CMAM outpatient protocol receive RUTF that has been formulated to provide the exact balance of micronutrients and electrolytes required for children suffering from acute malnutrition. These children should therefore not receive any supplementation with multi micronutrients.

Children suffering from acute malnutrition in combination with (moderate) anaemia are treated specifically for anaemia as per the national CMAM protocol. Even these children should not receive any supplementation with multi micronutrients.

In areas where multi-micronutrients supplementation is already in place, caretakers of children under treatment by the CMAM programme should be explicitly informed that their child should not take the multi-micronutrients until it has been discharged. After discharge it can be recommended to give multi-micronutrients as per the standard protocol for supplementation.