Management of severe Acute undernutrition

Manual for Health Workers in Sri Lanka

MINISTRY OF HEALTHCARE AND NUTRITION

SRI LANKA

IN COLLOBORATION WITH

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PREFACE

Despite substantial advances in the area of maternal and child mortality reduction, under nutrition remains a significant public health problem among women and children in Sri Lanka. The greatest tragedy of child under nutrition is that it prevents children from reaching their full potential for growth and development. Approximately 16% of children below 5 years of age suffer from wasting (weight-for-height below -2 standard deviations (<-2SD) of the World Health Organisation 2005 values) and are at risk of death or severe impairment of growth and psychosocial development.

This manual provides guidelines for the management of children under five years of age with severe acute under nutrition in hospitals and community settings. The manual is intended for health personnel working in the community and hospitals. It is a practical guide that aims to help health managers to design, implement and evaluate community based Nutrition Rehabilitation programme.

I wish to record my appreciation to the editors, members of the steering committee , other contributors and reviewers who assisted this task amidst their busy schedules. I wish to thank UNICEF for initiating this activity with the Ministry of Healthcare and Nutrition and for providing technical and financial assistance.

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1. PREAMBLE

Undernourished children are much more likely to contract illnesses, with or without complications, than their well nourished counterparts. With appropriate nutrition management in hospitals, clinics, homes and regular follow-up, growth and development of many children can be improved.

The aim of this manual is to provide simple, specific, practical instructions for the management of children suffering from **acute severe under nutrition** defined as severe wasting (weight-for-height < -3 z-scores of the WHO child growth standards median), the presence of bilateral pitting oedema (a sign of kwashiorkor), or both. The manual also gives guidelines on the use of "**Ready-to-use therapeutic food**" (RUTF). RUTF is a high-energy, mineral-and-vitamin enriched food. It is equivalent in formulation to Formula100 (F100), which is recommended by WHO for the treatment of malnutrition. The commercial forms of RUTF are BP 100 (a compressed biscuit), and Plumpy' nut (an oil based-paste or spread).

2. TARGET GROUP - case definition

The target group for nutrition rehabilitation is children aged 0-59 months with severe acute under nutrition as defined above.

3. OBJECTIVES

The overall objective is to improve the nutritional status of children with severe acute under nutrition through health facilities and community out-reaches.

Identification of children with severe acute under nutrition in the community

- Sensitise the community through the public health staff and community volunteers to bring their children to a clinic or health post for screening. Guidance on the community mobilisation and content of sensitisation messages are given in Annex-27 and 28.
- When children between 0 to 59 months are brought to the clinic or health post follow the following steps:
  - Weight should be measured with the Salter scale or UNISCALE (Refer Annex-1).
  - Height/length should be measured by height boards. Length will be measured till 2 years of age (Refer Annex-2).
  - Oedema should be checked by applying thumb pressure for 3 seconds on both feet. If a shallow print persists on both feet, then the child presents bilateral pitting oedema.
  - Identify children with bilateral pitting oedema and or those who are below -3SD of weight-for-height (severe acute under nutrition) using the weight-for-height table given in Annex-3.
- If the child is < 6 months and demonstrates sign of severe acute under nutrition refer to hospital for in patient management under a Paediatrician (lactation management, medical examination and investigations as deemed necessary).
- Apply the screening procedure when children are brought to the clinic and hospital for other services (immunisation) also.
- Public health staff and community volunteers will be engaged in active case findings through door to door visits to the households.

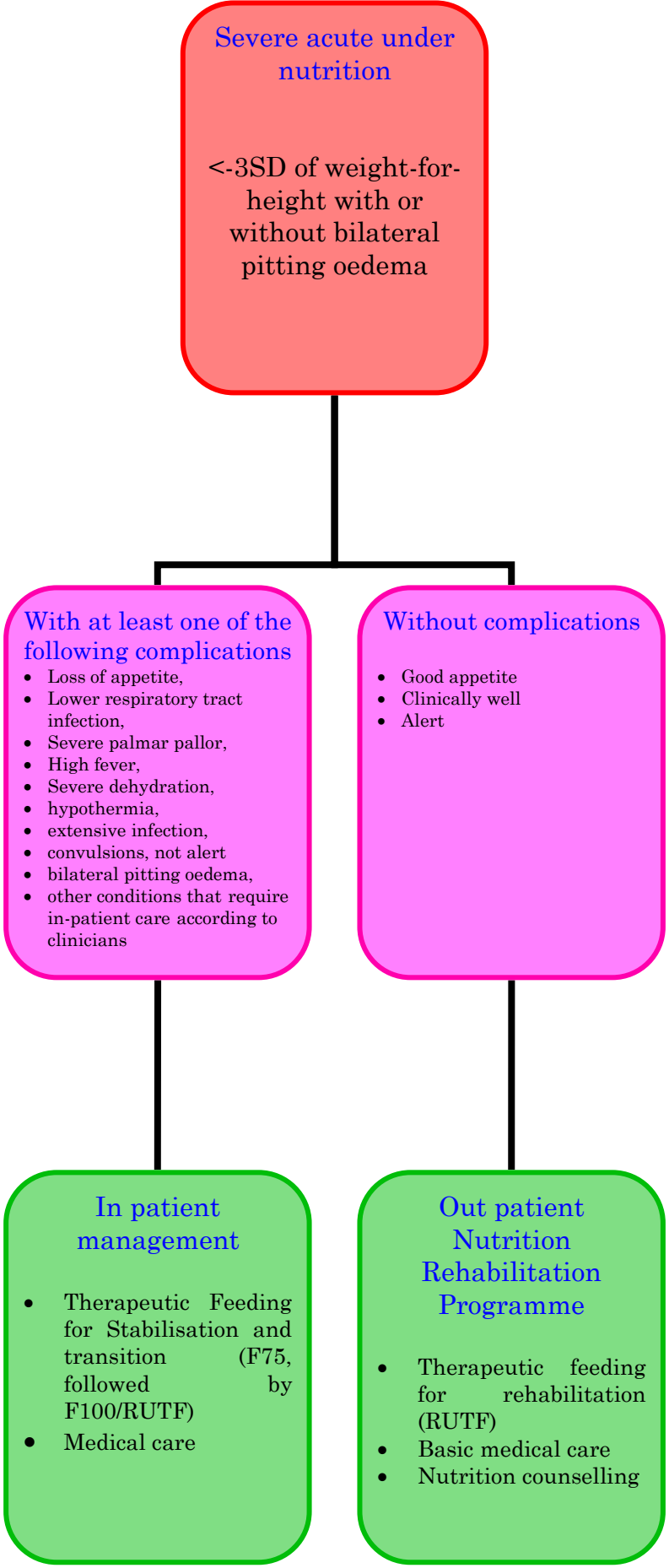
Screening and admission of children for Nutrition Rehabilitation Programme (NRP)

- Children with weight-for-height below -3SD (severe wasting) with or without bilateral pitting oedema should be admitted to the feeding programme.
- All children with severe acute under nutrition should be preferably assessed by a Paediatrician and, if not available by a Medical officer / Public Health Nursing Sister (PHNS) or Public Health Midwife (PHM).
- This assessment includes;
    - ➢A history of the presenting condition taken from the mother or caregiver
    - ➢Checking for bilateral pitting oedema
    - ➢Appetite
    - Give some RUTF to try and see whether the child eats it freely.
    - Provide sufficient time and a calm environment to allow the child to try out the food.
        - ➢Vomiting
        - ➢Diarrhoea
        - ➢Temperature
        - ➢Respiratory rate
        - ➢Pulse rate
        - ➢Pallor (Anaemia)
        - ➢Superficial infections
        - ➢Alertness
        - ➢Hydration status
- Severe acute under nourished children will be divided into 2 groups as shown in the diagram:
    I. **"Severe acute** under nourished **children without complications"**
    II. "**Severe acute** under nourished **children with complications"** (loss of appetite, lower respiratory tract infections, severe pallor, high fever, severe dehydration, not alert, hypothermia, extensive infections, convulsions, bilateral pitting oedema and other conditions that require in-patient care according to clinicians)
- Severe acute under nourished children **without complications** should be followed up in a clinic or health post every week or fortnightly and provided with take home ration of RUTF and ensure that they receive other services (deworming, Vitamin A, immunisation etc.).
- Severe acute under nourished children **with complications** should be admitted to the hospital for inpatient treatment.

4. IMPLEMENTATION PROCESS

Two forms of management are provided according to the child's condition:

- Those with severe acute under nutrition without bilateral pitting oedema who have appetite with no medical complications are treated on ambulatory basis with RUTF. It is taken at home, and the child returns to the feeding site weekly or fortnightly for check ups and more supplies of RUTF.
- Few with severe acute under nutrition with medical complications are managed as an inpatient with Formula 75 (F75) during the stabilisation phase (till life threatening problems are under control), then with Formula 100 (F100) in alternate with RUTF during the transition phase (return of appetite and reduced oedema or minimal oedema).


Severe acute under nutrition
<-3SD of weight-for-height with or without bilateral pitting oedema
With at least one of the following complications
Loss of appetite,
Lower respiratory tract infection,
Severe palmar pallor,
High fever,
Severe dehydration,
hypothermia,
extensive infection,
convulsions, not alert
bilateral pitting oedema,
other conditions that require in-patient care according to clinicians
Without complications
Good appetite
Clinically well
Alert
In patient management
Therapeutic Feeding for Stabilisation and transition (F75, followed by F100/RUTF)
Medical care
Out patient Nutrition Rehabilitation Programme
Therapeutic feeding for rehabilitation (RUTF)
Basic medical care
Nutrition counselling

Severe acute under nourished children without complications

Admission criteria for Out Patient Nutrition Rehabilitation Programme

New admissions	Children 6-59 months old and below –3SD weight-for-height without complications
Choice	Caregiver refuses inpatient care despite advise
Inpatient discharge	From inpatient care after "stabilisation treatment"
Readmission/ relapse	Previously discharged cured and again fulfils NRP criteria
Returned	After defaulting from NRP

Protocol & procedures for children without complications for Out Patient Nutrition Rehabilitation Programme

- Register all selected children in the registration book in the centre (Annex-4).
- Child's basic information should be recorded on the child's NRP card (Annex-5).
- Provide RUTF for the child.
- Refer to Annex-7 to identify the amount of ration in each RUTF product according to the weight of each selected child.
- Take home RUTF provides treatment and rehabilitation for children with severe acute under nutrition and with no additional serious medical complications.
- Children should be provided with routine medicine, vaccination, vitamins etc.
- Take home RUTF provides 200kcal/kg/day.
- The details of commercially available RUTF are given in Annex-6.
- RUTF can also be produce locally.
- If the child's medical condition is deteriorating or if weight loss for 2 consecutive weeks or static weight for 4 consecutive weeks is documented, refer to inpatient facility with specialised paediatric care.
- Child should be fed on RUTF in small amounts frequently (up to 6-8 times per day). If the child has more appetite, child should eat some family diet after eating the RUTF.
- If the mother is still breast feeding, she should be advised to continue breastfeeding as often as possible.
- Mothers or care givers should be advised that children who are eating BP100 as RUTF must be given sufficient safe drinking water (boiled or filtered or treated with chlorine) to keep them adequately hydrated, at least 200ml of safe drinking water with one bar. Use the guide provided in Annex-7 to advise the mother.

- When biscuits based RUTF is given for children under 2 years, caregivers should be advised to give to the child in porridge form. Children above 2 years can eat RUTF as porridge or biscuits form.
- Health worker should emphasise the need for the child to consume the entire ration daily. It is both a medicine and a food that is vital for the recovery of the child.
- When availability of food at household level improves, balanced family meals as indicated in Annex-23 should be given to the child in alternate to RUTF.
- Provide key education messages to mothers / caregivers as given in Annex-6 on storage of RUTF and the preparation method.
- Provide key education messages to mothers / caregivers on infant and young child feeding practices as well as prevention and management of diarrhoeal diseases at home.
- Ask the care giver to attend the clinic every week or fortnightly for medical check up, to receive additional medical treatments if needed, and to receive a supply of RUTF to last until their next appointment.
- The care giver should be informed that the RUTF should not be shared with other children in the household.
- Child should be provided with immunisation, Vitamin A and deworming drugs according to the national protocol.

Follow up

- Children's progress is monitored on a weekly / fortnightly basis at the clinic or health post.
- Record the weight of the child at each visit on the weight chart provided with the NRP card (Annex-5).
- Height is measured monthly and recorded in the NRP card and child health development record (CHDR)
- Check for oedema on feet, appetite and medical problems at each visit.
- Identify whether the child has gained weight according to weight chart in the NRP card.
- If child has not gained weight refer to the hospital for specialised paediatric care.

Discharge criteria for Out Patient Nutrition Rehabilitation Programme

Cured	Child's weight-for-height ≥ -3SD.
Defaulted	Absent for 2 consecutive weeks (home visit to check).
Transferred to inpatient care	1. Condition has deteriorated and requires inpatient hospital therapeutic care. 2. Weight loss for 2 consecutive weeks. 3. Static weight for 4 consecutive weeks 4. Has not reached discharge criteria after maximum of 2 months in NRP and with all available treatment options. Refer to a Paediatrician.

On discharge – follow supplementary feeding programme

- Child should be provided with one month supply of supplementary food.
- All discharges should be sent to the supplementary feeding programme where they stay till they reach >-1SD weight-for-height level, for a maximum of 3 months. If there is no improvement refer to a Paediatrician.

Moderate acute under nourished children

Admission criteria for Supplementary Feeding Programme

New admissions	Children 6-59 months old and between –3SD to -2SD weight-for-height without complications
Discharge from RUTF	From outpatient care after "RUTF treatment"
Readmission/ relapse	Previously discharged cured and again fulfils criteria
Returned	After defaulting from NRP

Follow up

- Check the weight every month
- Check the height/length every 3 months
- Plot the measurement on weight-for-height chart in the CHDR
- Follow the national protocol for supplementary feeding programme which supports moderate undernourished children without complications by providing the supplement of energy and nutrients as a dry-take-home ration every month. Available food items are Thriposha and Corn Soya Blend (CSB).
- Arrange the follow up visits every month to obtain supplementary food.

- Continue with supplementary food according to the national protocol till the child is >-1SD weight-for-age and thereafter another 2 months to maintain in that level (Annex-25)
- The child is discharged from supplementary feeding programme when the child reaches >-1SD.

Discharge criteria for Supplementary Feeding Programme

Cured	When children reach above -2SD for weight-for-height and remain so at two consecutive programme distributions
Defaulted	Children who are absent for more than three consecutive distributions need to be traced and followed up actively through home visits
Transferred to inpatient care	Non-responding; Children who do not reach the target weight-for-height after three months of receiving supplementary food – Need to be referred to hospital for further investigations.

Record Keeping

- Send the stock report and progress report every month to Family Health Bureau with a copy to RDHS.
- The family should be counselled, and taught to:
    - Prevent and manage diarrhoea
    - Provide energy and nutrient dense foods - 3 meals per day, plus giving nutritious food between meals twice daily (Annex-26).
    - The family should be given support with food security activities (support in agriculture, socioeconomic activities such as access to the market, micro-credit initiatives etc.)

Severe acute under nourished children with complications

Admission criteria for inpatient hospital NRP

New admissions	Children 0-59 months old and below –3SD weight-for-height reference with or without bilateral pitting oedema and with severe medical complications as :
	I. No appetite or unable to eat test dose of RUTF
	II. Intractable vomiting
	III. Fever > 39^0C or hypothermia < 35^0C
	IV. Lower respiratory tract infection according to Integrated Management of Childhood Illness (IMCI) guidelines for age. ➢ 50 breaths/ min for 6-12 months ➢ 40 breaths/ min for 1-5 yr
	V. Any chest indrawing
	VI. Severe anaemia (severe palmar pallor)
	VII. Extensive superficial infection requiring IM / IV treatment
	VIII. Very weak, apathetic, unconscious, convulsions
	IX. Severe dehydration based on history (caregivers interview)
Choice	Caregiver refuses outpatient care
Referral	From NRP take home programme due to: ➢ Deterioration of medical condition ➢ Weight loss for 2 consecutive weeks or static weight for 4 consecutive weeks ➢ Non recovery after 2 months in the NRP take home programme ➢ All children <6 months with severe acute undernutrition
Readmission/ relapse	Previously discharged cured and again fulfils criteria

Protocol and procedures for children with complications (inpatient hospital NRP)

- Register all selected children in the registration book in the hospital or health post (Annex-4).
- Child's basic information, the history and findings of physical examination should be recorded on the child's NRP card (Annex-5).
- Carry out relevant investigations as necessary and indicated by the Paediatrician / Medical officer.
- Suggested investigations and clinical observations on admission;
    - Blood sugar or clinical signs of hypoglycaemia
    - Haemoglobin / Full blood count or very severe anaemia
    - Hypothermia
    - Shock
    - Watery diarrhoea and or vomiting
    - Chest x'ray
    - Urine albumin
- Initiate feeding immediately with F-75, if the child is very sick and appetite is poor. F-75 is specially made to meet the child's needs during the initial phase of management (Annex-8, 9, 10 and 11). Feed using a cup or spoon, not by bottle. If appetite is good, start with RUTF.
- Volume of F-75 feed is 130ml/kg/day for a child with no severe oedema and 100ml/kg/day for a child with severe oedema divided into;
    - 2 to 3 hourly feeds 8-12 times a day, including during the night.
    - See Annex - 9 for feed volumes by child's weight using F-75.
    - Each child's feeds should be recorded on a 24-hour food intake chart (Annex-12)
    - If the child is on breast milk encourage the mother to breast feed the child on demand between F-75 feeds ensuring that the child still gets the required feeds of F-75.
    - It may be necessary to use a Nasogastric (NG) tube if the child is very weak, has mouth ulcers that prevent drinking, or if the child cannot take enough F-75 by mouth. The minimum acceptable amount for the child to take is 80% of the amount offered (Annex-9), At each feed, offer the F-75 orally first. Use an NG tube if the child does not take 80% of the feed (i.e. leaves more than 20%) for 2 or 3 consecutive feeds.

- If the child has continuing watery diarrhoea after he/she has been rehydrated, offer ReSoMal (Annex-15) or half strength oral rehydration solution (ORS) between feeds to replace losses from stools.
- If the child keeps vomiting, offer half the amount of feed twice as often (e.g. if 40ml of F75 every 2 hours, offer half amount [20ml] every hour) until vomiting stops.

- In the rare event that enteral feeding is impossible, ensure careful IV fluid infusion only if the child meets the following criteria.
  - If the severely under nourished child is considered to have shock if he or she
    - Is lethargic or unconscious and
    - Has cold hands
    - Plus either:
      - Slow capillary refill (longer than 3 seconds) or
      - Weak or fast pulse
- Use ½ Darrow, 5% Dextrose at 80ml/kg/day (rate well controlled).
- Prevent and treat hypoglycaemia (see Annex- 13)
- Prevent and treat hypothermia (see Annex- 14)
- Prevent and treat dehydration (see Annex-15)
- Treat infections (see Annex-16)
- Correct electrolyte imbalance and micronutrient deficiencies (see Annex-17)
- Provide stimulation, play and loving care (Annex-18)
- As soon as the child's appetite and general condition improves, F-100 should be used as a "catch-up" formula to rebuild wasted tissues in alternate with RUTF. Then increase the number of RUTF feeds while decreasing F100 feeds.
- Volume of the F100 feed is 150-220ml/kg/day divided into;
  - 4 hourly feeds 6 times a day
  - See Annex - 10 for feed volumes by child's weight for F100.
- Plan feeding for the ward as a whole, so that the staff know how much food to prepare, how much food to put in cups at each feed, etc. (Annex – 19 and 20)

Monitor individual child progress and care

- Clinician should calculate the child's weight gain in grams per kg body weight daily (Annex-22) after a child is taking F100 / RUTF using weight chart maintained in the ward (Annex-23) and judge whether weight gain is sufficient:

Good weight gain:	**10g/kg/day or more**
Moderate weight gain:	**5 up to 10g/kg/day**
Poor weight gain:	**Less than 5g/kg/day**

- Identify the child who is failing to respond using the following criteria:
    - Failure to regain appetite - 4 days after admission
    - Failure to start to lose oedema - 4 days after admission
    - Oedema still present - 10 days after admission
    - Failure to gain at least 5g/kg/day for 3 successive days after feeding freely on F100 and RUTF
- Determine causes of failure to respond
- Identify and implement solutions for the individual child
- Use the weight gain chart as a basis for discussion and problem solving with the staff and to complete the summary form (Annex-24).

Discharge criteria for inpatient hospital NRP

Appetite	Good (Feeding RUTF to the child over one day. When the child is eating at least 75% of the prescribed quantity of RUTF for his or her body weight)
Medical complications	Under control can discharge immediately and follow up at out patient level.
Bilateral oedema	Reduced or minimal

On discharge

- The child should be given a one week supply of RUTF to take home.
- The mother / caretaker should have a discharge card including the summary of the child's stay in hospital with the NRP card.

- Make a written referral using the referral form with NRP card to the nearest clinic or health post with ambulatory feeding programme to continue with RUTF until the child reaches discharge criteria (Annex-25).
- On discharge, advice mother/caregivers to give 3 family meals (Annex-26) in alternate with RUTF during ambulatory rehabilitation phase.

Record keeping

- Prepare a summary sheet (Annex-24) every 2 weeks and submit to MOH
- MOH should summarise report of all centres under him or her and submit to Deputy Director Provincial Health Services (DPDHS) every month.

Annex 1: Weight measurement

- The weight of children under six years of age is usually measured with a "**salter spring scale"**
- This scale can measure to the nearest 100 g the weight of children up to 25 kg.
- The child is weighed in a specially cut sack attached to the end of the spring scale. This model is light and easily transportable.
- Another scale is the UNISCALE (made by UNICEF) which is a digital, solar energy operated scale with a range from 2 to 150 kg in graduations of 100 g. The scale is powered by long-lasting lithium batteries. These will complete at least one million weighing cycles, or 400 weighing every working day for a minimum of ten years. The batteries and the electronics are in a sealed unit to withstand better humidity, heat, and dust. Additionally, the scale has a solar cell that is used only to turn the scale on and to tare the scale.
- The advantages of this scale are the readability of the measurement and the ability to weigh infants and small children together with their mothers. However, the child must weigh at least 2 kg.
- First, the mother is weighed alone on the scale, and then the automatic tare button is pressed. The child is then weighed in the mother's arms.
- It is important that the mother holds the child in her arms while standing in an upright position on the scale.

1. In preparing for weighing, the scale should be turned on by covering the solar cell for less than one second. The display should show 188.8 first, and then 0.0.
2. Now the mother can step on the scale and in case the weight of the mother should be noted the measurement can be taken from the display. Care should be taken that the solar cell is not covered by a foot or a long rope of the mother.
3. For the weight measurement of the child the solar cell should be covered again for less than a second while the mother is still standing still on the scale. The display will read again 0.0. The mother can get off the scale to get the child or the child can be handed over to the mother. In case the mother gets off the scale the display shows --,-. After the mother steps back onto the scale and holds the baby, only the weight of the infant will be displayed.
4. In case another baby should be weight with the same mother (or helper), the infant be handed back and another child can be weighed without taring the scale, since the weight of the adult has been memorized automatically. If another mother (or helper) is standing on the scale, the solar cell has to be covered again for less than a second for taring.

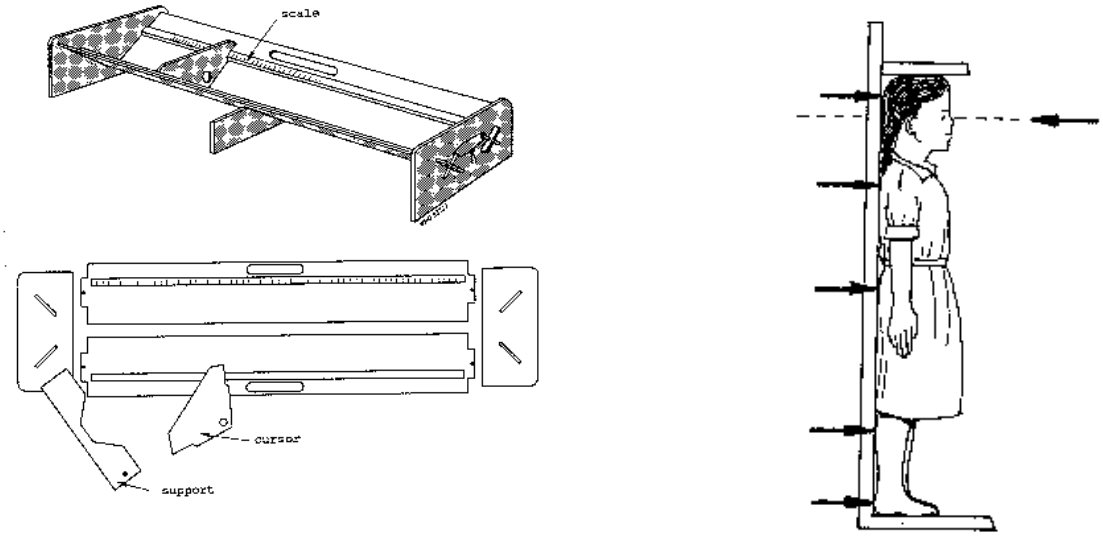
In both types of scales:

- The scale should be checked routinely, preferably at the beginning of each day. First, check the zero setting (the weight reading without any load applied) and then with the standard weight.
- Care should be taken that during weighing the child wears no shoes and as little clothing as possible. The weight is recorded to the nearest 0.1 kg.

Annex 2: Length / Height measurement

- Measurement of height (length or stature) requires somewhat more effort than that of weight.
- Children under two years of age (i.e., up to and including 23 months) are measured in a lying position.
- For length measurements, a specialized wooden device ("infantometer") or "Rollametre" should be used.
- The child is placed on its back between the slanting sides.
- The head should be placed so that it is against the top end.
- The knees should be gently pushed down by a helper.
- The cursor is then moved toward the child until it presses softly against the soles of the child's feet and the feet are at right angles to the legs.
- The length is then read in centimeters.

Figure: Infantometer for the length measurement of children under two years of age and stadiometer for stature measurement for children aged two years and older.



- If the child is over two years of age, stature is measured in a standing position.
- The child stands without shoes on a level floor.
- As shown in figure below, it is recommended that during measuring the child leans with its back against a wall.
- The legs are placed against each other, as also are the heels.
- The buttocks, shoulder blades and head should rest against the wall.
- The child should look straight ahead so that an imaginary plane that would connect the eyes and ears are parallel to the floor.
- The arms hang loosely by the sides.
- If microtoise is used to measure height it has to be fixed on a straight wall precisely 2.00 m above a flat floor.

If a child less than 2 years old will not lie down for measurement of length, measure standing height and **add 0.7cm** to convert it to length.

If a child aged 2 years or older cannot stand, measure recumbent length and **subtract 0.7cm** to convert it to height.

Annex 3: WHO child growth standard for Weight-for-length Boys and Girls (WHO2005)

Boys' weight (kg)				Length	Girls' weight (kg)			
-3SD	-2SD	-1SD	Median	Cm	Median	-1SD	-2SD	-3SD
2.4	2.6	2.9	3.1	49	3.2	2.9	2.6	2.4
2.6	2.8	3.0	3.3	50	3.4	3.1	2.8	2.6
2.7	3.0	3.2	3.5	51	3.6	3.3	3.0	2.8
2.9	3.2	3.5	3.8	52	3.8	3.5	3.2	2.9
3.1	3.4	3.7	4.0	53	4.0	3.7	3.4	3.1
3.3	3.6	3.9	4.3	54	4.3	3.9	3.6	3.3
3.6	3.8	4.2	4.5	55	4.5	4.2	3.8	3.5
3.8	4.1	4.4	4.8	56	4.8	4.4	4.0	3.7
4.0	4.3	4.7	5.1	57	5.1	4.6	4.3	3.9
4.3	4.6	5.0	5.4	58	5.4	4.9	4.5	4.1
4.5	4.8	5.3	5.7	59	5.6	5.1	4.7	4.3
4.7	5.1	5.5	6.0	60	5.9	5.4	4.9	4.5
4.9	5.3	5.8	6.3	61	6.1	5.6	5.1	4.7
5.1	5.6	6.0	6.5	62	6.4	5.8	5.3	4.9
5.3	5.8	6.2	6.8	63	6.6	6.0	5.5	5.1
5.5	6.0	6.5	7.0	64	6.9	6.3	5.7	5.3
5.7	6.2	6.7	7.3	65	7.1	6.5	5.9	5.5
5.9	6.4	6.9	7.5	66	7.3	6.7	6.1	5.6
6.1	6.6	7.1	7.7	67	7.5	6.9	6.3	5.8
6.3	6.8	7.3	8.0	68	7.7	7.1	6.5	6.0
6.5	7.0	7.6	8.2	69	8.0	7.3	6.7	6.1
6.6	7.2	7.8	8.4	70	8.2	7.5	6.9	6.3
6.8	7.4	8.0	8.6	71	8.4	7.7	7.0	6.5
7.0	7.6	8.2	8.9	72	8.6	7.8	7.2	6.6
7.2	7.7	8.4	9.1	73	8.8	8.0	7.4	6.8
7.3	7.9	8.6	9.3	74	9.0	8.2	7.5	6.9
7.5	8.1	8.8	9.5	75	9.1	8.4	7.7	7.1
7.6	8.3	8.9	9.7	76	9.3	8.5	7.8	7.2
7.8	8.4	9.1	9.9	77	9.5	8.7	8.0	7.4
7.9	8.6	9.3	10.1	78	9.7	8.9	8.2	7.5
8.1	8.7	9.5	10.3	79	9.9	9.1	8.3	7.7
8.2	8.9	9.6	10.4	80	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	81	10.3	9.4	8.7	8.0
8.5	9.2	10.0	10.8	82	10.5	9.6	8.8	8.1
8.7	9.4	10.2	11.0	83	10.7	9.8	9.0	8.3
8.9	9.6	10.4	11.3	84	11.0	10.1	9.2	8.5
9.1	9.8	10.6	11.5	85	11.2	10.3	9.4	8.7
9.3	10.0	10.8	11.7	86	11.5	10.5	9.7	8.9

WHO child growth standard for Weight-for-length Boys and Girls (WHO2005)

Boys' weight (kg)				Height	Girls' weight (kg)			
-3SD	-2SD	-1SD	Median	Cm	Median	-1SD	-2SD	-3SD
9.6	10.4	11.2	12.2	87	11.9	10.9	10.0	9.2
9.8	10.6	11.5	12.4	88	12.1	11.1	10.2	9.4
10.0	10.8	11.7	12.6	89	12.4	11.4	10.4	9.6
10.2	11.0	11.9	12.9	90	12.6	11.6	10.6	9.8
10.4	11.2	12.1	13.1	91	12.9	11.8	10.9	10.0
10.6	11.4	12.3	13.4	92	13.1	12.0	11.1	10.2
10.8	11.6	12.6	13.6	93	13.4	12.3	11.3	10.4
11.0	11.8	12.8	13.8	94	13.6	12.5	11.5	10.6
11.1	12.0	13.0	14.1	95	13.9	12.7	11.7	10.8
11.3	12.2	13.2	14.3	96	14.1	12.9	11.9	10.9
11.5	12.4	13.4	14.6	97	14.4	13.2	12.1	11.1
11.7	12.6	13.7	14.8	98	14.7	13.4	12.3	11.3
11.9	12.9	13.9	15.1	99	14.9	13.7	12.5	11.5
12.1	13.1	14.2	15.4	100	15.2	13.9	12.8	11.7
12.3	13.3	14.4	15.6	101	15.5	14.2	13.0	12.0
12.5	13.6	14.7	15.9	102	15.8	14.5	13.3	12.2
12.8	13.8	14.9	16.2	103	16.1	14.7	13.5	12.4
13.0	14.0	15.2	16.5	104	16.4	15.0	13.8	12.6
13.2	14.3	15.5	16.8	105	16.8	15.3	14.0	12.9
13.4	14.5	15.8	17.2	106	17.1	15.6	14.3	13.1
13.7	14.8	16.1	17.5	107	17.5	15.9	14.6	13.4
13.9	15.1	16.4	17.8	108	17.8	16.3	14.9	13.7
14.1	15.3	16.7	18.2	109	18.2	16.6	15.2	13.9
14.4	15.6	17.0	18.5	110	18.6	17.0	15.5	14.2
14.6	15.9	17.3	18.9	111	19.0	17.3	15.8	14.5
14.9	16.2	17.6	19.2	112	19.4	17.7	16.2	14.8

Annex – 4: Registration record

(to be maintained at screening centers)

District:……. MOH area:…… PHM area:……. Center:……hospital/clinic/camp

Serial No.	CHDR Rregistration No.	Child's name	Mother's/ care givers name	Age in months	Sex M/F	Admission					Admission criteria	Follow up visits 1-8 weeks			Discharge				Length of stay	Weight gain
						Date	Wt (kg)	Ht (cm)	Oedema	Wt-Ht		Date	Wt	RUTF	Date	Wt	Wt/Ht	Outcome		
								Weekly summary												

Admission criteria: 1= New admission <-3SD; 2=New Admission (Other-oedema); 3= Refer default; 4= Transferred from In patient; 5= Transferred from targeted supplementary feeding programme

Outcome: 1=cured; 2=not recovered (refer to inpatient); 3=default

Length of stay = date of discharge – date of admission (days)

Weight gain = weight at discharge – wt at admission in grams /wt at admission X no. of days (g/kg/day)

Registration No. in the NRP card: (Registration number in the CHDR / Serial No. in the registration book)

Annex 5: Childs NRP Card

Name:				**Reg. N:(CHDR / SNO)**			
MOH area:				**PHM area:**			
Age in months:		**Sex**	**M / F**	**Date of screening:**			
Admission:	**Community**	**From hospital**		**Readmission**			**Refusal to be hospitalised**
Anthropometry on admission and discharge (to be completed at community level)							
	Admission			**Discharge**			
Weight (kg):							
Height (cm):							
Wt-for-ht:							
History (completed for all children–ON ADMISSION)							
Diarrhoea:	**Yes**	**No**		**Stools/day**	**1-3**	**4-5**	**>5**
Vomiting:	**Yes**	**No**		**Passing urine:**		**Yes**	**No**
Cough:	**Yes**	**No**		**Breast feeding:**		**Yes**	**No**
Appetite:	**Good**	**Poor**	**None**	**Fever:**		**Yes**	**No**
Reported problems:							

Physical Examination (completed for all children on admission and during hospital stay and on discharge from the hospital)							
Date:							
Respiratory rate (min):							
Temperature C^0							
Eyes:							
Ears:							
Lymph nodes:							
Skin changes:							

Medications and Investigations (only hospitalised children-SUMMARY DURING THE HOSPITALISATION)

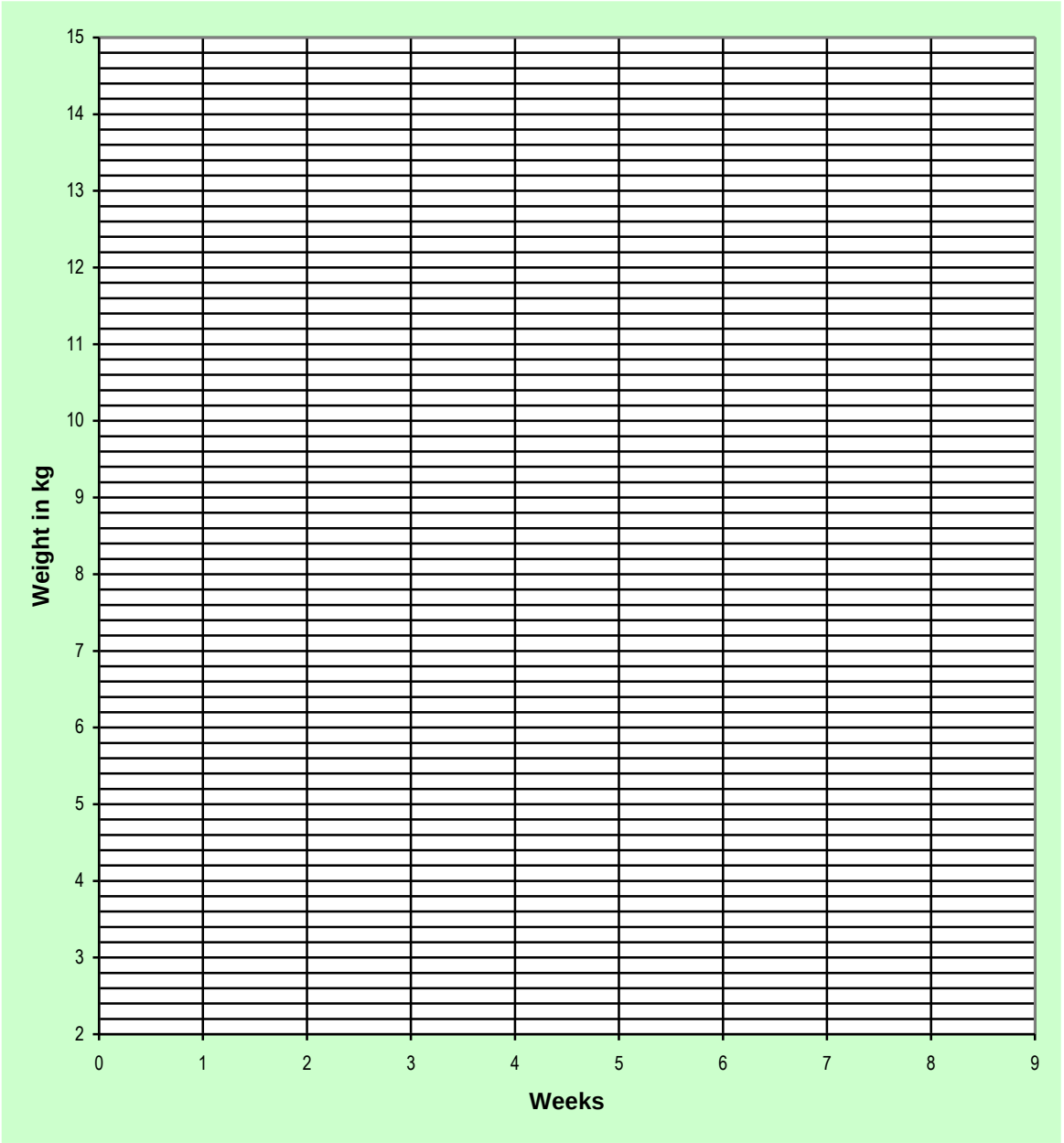
Date	**Drug**	**Dosage**		**Date**	**Investigations**

Follow up during admission (only hospitalised children-MAINTAIN DAILY)						
Date						
Weight (kg)						
Vol. of F-75 (ml)						
Vol. of F-100 (ml)						
Amount of RUTF						

Follow up weight record card at out patient level

Weeks	0wk	1wk	2wk	3wk	4wk	5wk	6wk	7wk	8wk
Weight (kg)									
No. of RUTF issued									
No. of RUTF consumed									
Any complaint									

(Weight the child weekly, record the weight in the chart. Use the reference weight-for-height chart (Annex-2) to determine the child's desired weight (-2SD). Mark the desired discharge weight with horizontal line across the chart. Each week plot the child's weight on the chart. Plot the starting weight at week 1. Mark each point with an X or large dot so that it shows up clearly. Connect the points to see the child's progress.)



Annex 6: The Details of BP 100

BP 100 is a compressed food product fortified with micronutrients for use in the rehabilitation of phase of severely malnourished children. BP100 is both a **medicine** and a food that is vital for the recovery of the child. When the child is less than 2 years use it as porridge and for the children >2 years it can be used as biscuits.

BP 100 can be eaten as tablets from the pack together with sufficient drinking water, or crumbled into water and eaten as porridge. It is advisable to give as porridge due to the need for sufficient water for children under 2 years. One bar (two tablets) of BP 100 contains 300 kcal. Always feed small, but many meals per day in the initial phase of rehabilitation to avoid overloading of the intestine, liver and kidney. The intake of BP 100 should not be mixed in the same meal with local food items as the latter may contain components inhibiting the absorption of vitamins and minerals.

Storage

- Store in a dry cool place
- The integrity of the package is essential
- The shelf life is maximum 48 months from the date of manufacture indicated on the packaging
- Once the alufoil packaging is opened, the product should be used within 2 weeks,
- Porridge made of BP 100 and water should be used within 3 hours.
- To make a porridge use 100ml (½ cup) of boiled cooled water per tablet.

Annex 7: Guide to identify the amount of ration according to the weight of each selected child (BP100 and Plummpy, nut)

BP100 (1 packet = 9 bars; 1 bar=2 tablets = 300kcal)

Weight of the child (kg)	Amount of BP-100 (150kcal/ per tablet)		
	No. of bars per day	No. of packets & bars per week	No. of packets & bars per Fortnightly
3.5 – 4.4	2.5	2 pack	4 pack
4.5 – 5.4	3	2 pack	5 pack
5.5 – 5.9	3.5	3 pack	5 pack
6.0 – 6.9	4	3 pack	6 pack
7.0 – 7.9	4.5	4 pack	7 pack
8.0 – 8.9	5	4 pack	8 pack
9.0 – 9.9	6	5 pack	9 pack
10.0 – 10.9	6.5	5 pack	10 pack
11.0 – 11.9	7	5 pack	11 pack
≥12	8	6 pack	12 pack

Amount of water to be used for each meal (cup = tea cup)

- To prepare porridge with ½ bar (1 tablet) use 100 ml or ½ of a cup
- To prepare porridge with 1 bars (2 tablets) use 200 ml or 1of a cup
- To prepare porridge with 1½ bars (3 tablets) use 300 ml or 1 ½ cup
- To prepare porridge with 2 bars (4 tablets) use 400 ml or 2 cups
- To prepare porridge with 2½ bars (5 tablets) use 500 ml or 2 ½ cups

Plumpy' nut

(92g packets containing 500kcal – average 200kcal/kg/day)

Weight of child (kg)	Packets per day	Packets per week
3.5 - 3.9	1.5	11
4.0 - 5.4	2	14
5.5 - 6.9	2.5	18
7.0 - 8.4	3	21
8.5 - 9.4	3.5	25
9.5 - 10.4	4	28
10.5 - 11.9	4.5	32
≥12	5	35

Annex 8: Details of Feeding Formulas: F75 and F100

F75 is the “starter” formula to use during initial management, beginning as soon as possible and continuing until the child is stabilised.

F75 contains 75kcal and 0.9g protein per 100ml.

F100 contains more calories and protein: 100kcal and 2.9g protein per 100ml.

Details on F75 and F100 and preparation method

Composition of F-75 and F-100

Contents per 100ml	F-75	F-100
Energy (Kcal)	75	100
Protein (g)	0.9	2.9
Lactose (g)	1.3	4.2
Potassium (mmol)	3.6	5.9
Sodium (mmol)	0.6	1.9
Magnesium (mmol)	0.43	0.73
Zinc (mg)	2.0	2.3
Copper (mg)	0.25	0.25
% of energy from protein	5	12
% of energy from fat	32	53
Osmolarity (mOsmol/l)	333	419

Preparation of F-75 / F-100

- They are commercially available as powder formulations that can be mixed with clean water.
- Once mixed with water, the mixture must be used rapidly;
- One sachet of 456 g diluted in 2 litres of drinking water gives 2.4 litres high energy milk (100 kcal/100 ml); Prepare quantities according to the number of children available.
- Use of F 75 for the first phase (stabilization) and F100 in the transition phase.
- F75 and F100 should be used only for inpatient care.
- Add 350 ml drinking water per 1 litre of F 100 in order to prepare F75 which has low osmolairty and the energy density of 75 kcal/100 milk.
- If ready-to-use F75 or F100 are not available, they can be prepared using local ingredients and a complex of minerals and vitamins.

Administering the F-75 / F-100

- A cup and/or spoon should be used for feeding.
- Initially, only liquid formula feeds should be given.
- After 2-7 days, semi-solid food can be introduced (when appetite returned and oedema reduced or minimal).
- For all infants and young children, breast-feeding should be continued in addition to solid feeding. Feeding should be continued, even if a child occasionally vomits.

Organizing a therapeutic feeding centre

- Each centre must have: enough water (30 litres per person per day)
- Each therapeutic feeding centre will require the same basic equipment. As a rough guide, a centre that cares for 50 children will need the following:
- 5 buckets, 5 stirrers, 5 measuring cups
- 100 feeding cups and spoons
- Pediatrician / Medical officer should be in charge.

Storage

- In a cool and dry place, protected from UV light
- Shelf life: 6 months
- F75 / F100 should be kept in its original packaging.
- Once opened, the sachet must be immediately used up. The sachet can be kept if well closed and kept in an airtight container.
- Once reconstituted, the milk should be consumed within 2 hours
- Destroy immediately milk powder if the color, the smell or the aspect of the milk has changed, even if the expiry date is not yet reached, since there is an important risk of organoleptic change of the product.

Hygiene and food safety

- Plenty of clean and safe water (at least 30 litres per person per day) must be available in the health facilities);
- Foods must be protected from flies, insects, and dust, and should not be reconstituted in advance;
- The mothers or other caregivers should clean the children's feeding plates and utensils after every meal;
- Everyone who feeds the children must wash their hands with soap first;
- Latrine facilities must be available for patients and personnel.

Record-keeping

- Each child's progress should be carefully monitored and full records should be kept, including weight charts.

Annex 9: In patient management
Feed volumes for the child with F75

Weight of the child (kg)	Range of volumes per 4-hourly feed of F-75 (6-12 feeds daily)			Range of daily volumes of F-75	
	Every 2 hours (12 feeds)	Every 3 hours (8 feeds)	Every 4 hours (6 feeds)	Daily total (130ml/kg/day)	80% of daily total (minimum)
2.0	20	30	45	260	210
2.2	25	35	50	286	230
2.4	25	40	55	312	250
2.6	30	45	55	338	265
2.8	30	45	60	364	290
3.0	35	50	65	390	310
3.2	35	55	70	416	335
3.4	35	55	75	442	355
3.6	40	60	80	468	375
3.8	40	60	85	494	395
4.0	45	65	90	520	415
4.2	45	70	90	546	435
4.4	50	70	95	572	460
4.6	50	75	100	598	480
4.8	55	80	105	624	500
5.0	55	80	110	650	520
5.2	55	85	115	676	540
5.4	60	90	120	702	560
5.6	60	90	125	758	580
5.8	65	95	130	754	605
6.0	65	100	130	780	625
6.2	70	100	135	806	645
6.4	70	105	140	832	665
6.6	75	110	145	858	685
6.8	75	110	150	884	705
7.0	75	115	155	910	730
7.2	80	120	160	936	750
7.4	80	120	160	962	770
7.6	85	125	165	988	790
7.8	85	130	170	1014	810
8.0	90	130	175	1040	830
8.2	90	135	180	1066	855
8.4	90	140	185	1092	875
8.6	95	140	190	1118	895
8.8	95	145	195	1144	915
9.0	100	145	200	1170	935
9.2	100	150	200	1196	960
9.4	105	155	205	1222	980
9.6	105	155	210	1248	1000
9.8	110	160	215	1274	1020
10.0	110	160	220	1300	1040

Annex10: Feed volumes for the child with F-100

Weight of the child (kg)	Range of volumes per 4-hourly feed of F-100 (6 feeds daily)		Range of daily volumes of F-100	
	Minimum (ml)	Maximum (ml)	Minimum (150ml/kg/day)	Maximum (220ml/kg/day)
2.0	50	75	300	440
2.2	55	80	330	484
2.4	60	90	360	528
2.6	65	95	390	572
2.8	60	105	420	616
3.0	75	110	450	660
3.2	80	115	480	704
3.4	85	125	510	748
3.6	90	130	540	792
3.8	95	140	570	836
4.0	100	145	600	880
4.2	105	155	630	924
4.4	110	160	660	968
4.6	115	170	690	1012
4.8	120	175	720	1056
5.0	125	185	750	1100
5.2	130	190	780	1144
5.4	135	200	810	1188
5.6	140	205	840	1232
5.8	145	215	870	1276
6.0	150	220	900	1320
6.2	155	230	930	1364
6.4	160	235	960	1408
6.6	165	240	990	1452
6.8	170	250	1020	1496
7.0	175	255	1050	1540
7.2	180	265	1080	1588
7.4	185	270	1110	1628
7.6	190	280	1140	1672
7.8	195	285	1170	1716
8.0	200	295	1200	1760
8.2	205	300	1230	1804
8.4	210	310	1260	1848
8.6	215	315	1290	1892
8.8	220	325	1320	1936
9.0	225	330	1350	1980
9.2	230	335	1380	2024
9.4	235	345	1410	2068
9.6	240	350	1440	2112
9.8	245	360	1470	2156
10.0	250	365	1500	2200

Annex11: In patient management
Preparation of F-75 and F-100

Feed volumes for the child with F-75

Weight of the child (kg)	Range of volumes per 4-hourly feed of F-75 (6-12 feeds daily)			Volume to be prepared every 3 hr	
	Every 2 hours (12 feeds)	Every 3 hours (8 feeds)	Every 4 hours (6 feeds)	F-75 (g)	Water (L)
2.0-2.9	20	30	45	1 teaspoon	25
3.0-3.9	35	50	65	2 teaspoon	40
4.0-4.9	45	65	90	2 ½ teaspoon	50
5.0-5.9	55	80	110	3 ½ teaspoon	75
6.0-6.9	65	100	130	4 teaspoon	90
7.0-7.9	75	115	155	4 ½ teaspoon	100
8.0-8.9	90	130	175	5 ½ teaspoon	110
9.0-9.9	100	145	200	6 teaspoon	130

Feed volumes for the child with F-100

Weight of the child (kg)	Range of volumes per 4-hourly feed of F-100 (6 feeds daily)	Volume to be prepared every 3 hr	
	Feed	F-100 (g)	Water (L)
2.0-2.9	75	3 teaspoon	80
3.0-3.9	110	5 teaspoon	130
4.0-4.9	145	6 teaspoon	160
5.0-5.9	185	7 teaspoon	200
6.0-6.9	220	8 teaspoon	240
7.0-7.9	255	10 teaspoon	270
8.0-8.9	295	12 teaspoon	320
9.0-10.0	330	13 teaspoon	350

Annex 12: 24-hour food intake chart for inpatient management

(Complete one chart for every 24-hour period)

Name:…….. Hospital BHT No:…… Admission Weight (kg):…… Today's weight (kg):…….

DATE: **TYPE OF FEED:** **GIVE:_____ feeds of _____ml**						
Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a-b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
		Column totals	c.	d.	e.	Total yes:
Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) – total amount vomited (e) = _____ml						

Annex 13: Prevent and treat hypoglycaemia

(WHO 2002, Module 3)

- Treat asymptomatic hypoglycaemia (blood glucose of under 3mmol/L or, where a blood glucose machine is not available, under 4mmol/L by visual reading or by clinical signs judgement) with a feed of F-75 or 10% glucose (50ml) orally. Re check the blood sugar in 30 minutes to assure it is above 3mmol/L (4mmol/L if no blood glucose machine). If not, repeat feed as above.
- Treatment of hypoglycaemia should start as soon as the child reaches the hospital. Such children should not wait in queue and should be quickly given 50ml glucose solution (10%).
- Treat symptomatic hypoglycaemia (fits/decreased level of consciousness/ eye lids retraction), severe hypoglycaemia (<1.5mmol/L) should be treated by 5ml/kg, 10% dextrose solution IV. If only 50% dextrose is available, dilute 1 part of 50% dextrose solution with 4 parts sterile water.
- If the child who are able to drink, give the 50ml bolus orally. If the child is alert but not drinking, give the 50ml by Naso-gastric tube.
- If the child is lethargic, unconscious or convulsing, give 5ml'kg body weight of sterile 10% glucose by IV, followed by 50ml of 10% glucose or sucrose by NG tube (if the child will be given IV fluids for shock, there is no need to follow the 10% IV glucose with an NG bolus, as the child will continue to receive glucose in the IV fluids.
- Start feeding F-75 half an hour after giving glucose and give it every half-hour during the first 2 hours. For a hypoglycaemic child, the amount to give every half-hour is ¼ of the 2 hourly amounts shown on Annex-9.
- Take another blood sample after 2 hours and check the child's blood glucose again. If blood glucose is 3mmol/L or higher change to 2-hourly feeds of F-75. If still low, make sure antibiotics and F-75 have been given. Keep giving F-75 every half-hour (Annex-9).
- Test blood glucose 3 hourly in severely ill children.

Annex 14: Prevent and treat hypothermia

(WHO 2002, Module 3)

Hypothermia is present when the under-arm temperature is below 35ºC (<35.5 ºC body temperature), and indicates the need to immediately warm up and feed the child.

- **Prevent Hypothermia**
    - Measure under-arm temperature 3 hourly
    - Keep the child covered at all times, including the head, especially at night.
    - Stop draughts in the room; move the child away from window.
    - Keep the child dry.
    - Avoid exposure (such as bathing) to cold temperature, motivate the mother to bathe the child during the hottest hours of the day, not in the early morning or evening.
    - Dry the child carefully after bathing.
    - Promptly change wet clothes or bedding.
    - Use mother-child skin to skin contact (Kangaroo care) to keep the child warm.
- **Treat Hypothermia**
    - Immediately place the child in skin to skin contact (Kangaroo care) against mother's chest and/or abdomen and wrap both with blankets. Give a hot drink to the mother.
    - If the mother is absent, clothe and wrap the child (including the head) with a warmed blanket.
    - Monitor temperature during re-warming to avoid hyperthermia or uncorrected hypothermia. Check the temperature every 2 hours until it rises over 36.*5 ºC.*

Annex15: Prevent and treat Dehydration

(WHO 2002, Module 3)

Many children with severe acute under nutrition also suffer from diarrhoea, and may therefore become dehydrated.

- **To prevent dehydration in a child with diarrhoea:**
    - Replace approximate volume of stool losses with half diluted ORS (Jeevani) or when available ReSoMal. ReSoMal is a rehydration solution for undernourished children and is the one to use in case of dehydration of a severe acute undernourished child) or after each stool passed.

Composition of ReSoMal

Glucose	55 mmol
Saccharose	73 mmol
Potassium	40 mmol
Sodium	45 mmol
Chloride	70 mmol
Citrate	7 mmol
Magnesium	3 mmol
Zinc	300 micromol
Copper	45 micromol
Osmolarity of the solution	294 mEq / liter

Preparation of ReSoMal

- They are commercially available as powder formulations that can be mixed with clean water.
- Once mixed with water, the mixture must be used within 24 hours;
- One sachet of 84 g diluted in 2 litres of drinking water; Prepare quantities according to the number of children available.
- Give ReSoMal / ORS as follows, in amounts based on the child's weight

How often to give ReSoMol	**Amount to give**
Every 30 minutes for first 2 hours	5ml/kg body weight
Alternate hours for up to 10 hours	5 - 10 ml/ kg*

(* Amount offered in this range should be based on the child's willingness to drink and the amounts of ongoing losses in the stool or vomitus)

- If the child has already received IV fluids for shock and is switching to ReSoMal / ORS, omit the first 2-hour treatment and start with the amount for the next period of up to 10 hours.
- F-75 is given in alternate hours during this period until the child is rehydrated.
- Encourage continued breast feeding if breastfed.

Recognize the need for ReSoMal

- It is difficult to determine dehydration status in a severely malnourished child, as the usual signs of dehydration (such as lethargy, sunken eyes) may be present in these children all of the time, whether or not they are dehydrated.
- Ask the mother if the child has had watery diarrhoea or vomiting. If the child has watery diarrhoea or vomiting, assume dehydration and give ReSoMal. (Also ask about blood in the stool, as this will affect choice of antibiotics.)
- Even if a severely malnourished child has oedema, he may be dehydrated. The oedema indicates a loss of control of fluid distribution in the body, rather than too much fluid. If the child has diarrhoea or vomiting, give ReSoMal even if the child has oedema.
- Note the following signs of dehydration in order to detect improvements later. Even though the signs may be misleading, if they go away after giving ReSoMal, you will know that the ReSoMal has had a good effect.

Signs of Dehydration

Lethargic	A lethargic child is not awake and alert when he should be. He is drowsy and does not show interest in what is happening around him.
Restless, irritable	The child is restless and irritable all the time, or whenever he is touched or handled.
Absence of tears	Observe whether the child has tears when he cries.
Sunken eyes	The eyes of a severely malnourished child may always appear sunken, regardless of the child's hydration status. Ask the mother if the child's eyes appear unusual. Photographs 6, 30, and 31 (in the *Photographs* booklet) show sunken eyes.
Dry mouth and tongue	Feel the child's tongue and the inside of the mouth with a clean, dry finger to determine if they are dry.
Thirsty	See if the child reaches out for the cup when you offer ReSoMal. When it is taken away, see if the child wants more.
Skin pinch goes back slowly	Using your thumb and first finger, pinch the skin on the child's abdomen halfway between the umbilicus and the side of the abdomen. Place your hand so that the fold of skin will be in a line up and down the child's body, not across the body. Firmly pick up all the layers of skin and tissue under them. Pinch the skin for one second and then release. If the skin stays folded for a brief time after you release it, the skin pinch goes back slowly. (*Note: The skin pinch may always go back slowly in a wasted child.)*

Give ReSoMal slowly

- It is essential to give ReSoMal / ORS slowly, much more slowly than you would give ORS to a well-nourished child.
- Too much fluid, too quickly, can cause heart failure.
- The best way to give ReSoMal/ORS is by cup, even with a very sick child. The child may need to be coaxed, or you may need to use a spoon or syringe.
- If the mother is able to give the ReSoMal / ORS, she should be taught to give it slowly.
- A nasogastric (NG) tube can be used for giving ReSoMal / ORS at the same rate if the child is too weak to take enough fluid voluntarily. An NG tube should be used in weak or exhausted children, and in those who vomit, have fast breathing, or painful mouth sores.
- IV fluids should not be used to treat dehydration (except in case of shock as discussed earlier). Since the degree of dehydration cannot be determined by clinical signs, and too much fluid could cause heart failure, it is very important that fluids not be forced on the child. When fluids are given orally, the child's thirst helps to regulate the amount given.

Monitor the child who is taking ReSoMal

- Monitor the child's progress every half hour for the first two hours; then monitor hourly, i.e., every time the child takes F-75 or ReSoMal ORS.

Signs to check

- Respiratory rate – Count for a full minute.
- Pulse rate – Count for 30 seconds and multiply by 2.
- Urine frequency – Ask: Has the child urinated since last checked?
- Stool or vomit frequency – Ask: Has the child had a stool or vomited since last checked?
- Signs of hydration – Have tears returned? Is the mouth less dry? Is the child less lethargic or irritable? Are the eyes less sunken? Does a skin pinch go back faster?
- Check severe pallor as soon as the child receives IV (especially at the beginning).
- Record the above information on the CCP; then give ReSoMal and record the amount taken. Notice any changes when you check the signs above.

Signs of improving hydration status

- Fewer or less pronounced signs of dehydration, for example:
  - less thirsty
  - skin pinch not as slow
  - less lethargic

  Note: Although these changes indicate that rehydration is proceeding, many severely malnourished children will not show these changes even when fully rehydrated.
- Slowing of rapid respiratory and pulse rates
- Passing urine
- Not thirsty

If a child has 3 or more of the above signs of improving hydration status, stop giving ReSoMal routinely in alternate hours. Instead, offer ReSoMal after each loose stool, as described in section 6.7 below.

Signs of Overhydration

Stop ReSoMal if any of the following signs appear:

- Increased respiratory rate and pulse. (Both must increase to consider it a problem.)
- Jugular veins engorged. (Pulse wave can be seen in the neck.)
- Increasing oedema (e.g., puffy eyelids).

Annex 16: Treat infections

(WHO 2002, Module 3)

Infection is common among severely undernourished children and signs of infection such as fever, are often absent.

- **Consider all children admitted as infected and start treatment according to the national protocol while investigating for the infection.**
- **Choice of broad spectrum antibiotics for bacterial infection**
    - **Child with no signs of infections** (no danger signs present), must receive oral antibiotics as below:
        - Amoxycillin 15mg/kg/day 8 hourly orally for 5 days
    - **Child is severely ill or as complications** (hypoglycaemia, hypothermia, lethargy, skin lesions, respiratory infection), must receive antibiotics as below:
        - Gentamycin 7.5mg/kg/24 hourly IV or IM for 7 days

        AND
        - Ampicillin 50mg/kg IV bd 2 days.

        FOLLOWED BY
        - Oral Amoxycillin 15mg/kg 8 hourly for 5 days.
- **If child fails to improve in 48 hours:**
    - Check if all the above steps have being carried out.
    - Check for correct feeding
    - Investigate aggressively for occult infection (chest / urine / blood / CSF) and if possible referrals to specialised paediatric care.

Annex 17: Correct electrolyte imbalance and micronutrient deficiencies

(WHO 2002, Module 3)

- All severely malnourished children have electrolyte imbalances
    - Prepare food without added salt
- Treat and prevent electrolyte imbalances
- Treat and prevent vitamin deficiency
    - Give Vitamin A according to the national protocol
- Treat and prevent iron deficiency only after the child has started to gain weight
    - Iron supplementation is not given until the child starts to gain weight, even if anaemic.
    - Once gaining weight give: 3mg/kg/day elemental Iron daily,

E.g. table of dosage using Ferrous fumarate in a syrup form:

Weight of the child	**Dose of Iron syrup (Ferrous Fumarate) 100mg per 5ml (20mg elemental iron per ml)**
3 up to 6 kg	0.5ml
6 up to 10kg	0.75ml
10 up to 15kg	1ml

- Always give iron orally, never give injections.
- Give iron supplement preferably between feeds.
- At this stage give Mebandazole 100mg twice daily orally for 3 days for children above two year.

Annex 18: Provide stimulation, play and loving care

(WHO Steps 9)

- From the time of admission provide tender loving care.
- Structure play and activity in a cheerful stimulating environment encouraging mother's involvement as far as possible.
    - Hang colourful objects from the cot rails
    - Pick child up at least hourly for love, play and contact
    - Sing or have music playing
    - Use a kind, soothing voice.
    - Use simple hand made toys for playing

Annex 19: Plan feeding for the ward

The ward schedule should include times for the following activities:

- Preparing feeds (as often as necessary to ensure freshness)
- Reviewing patient charts and planning feeding for the day
- Feeding according to 2-hourly, 3-hourly, and 4-hourly plans
- Weighing
- Bathing
- Shift changes

Time for preparing feeds

- Feeds should be prepared every 2 hours.
- Food must be discarded after 2 hours.

Time for review and planning

- Select a time of day to review each child's past 24-hour food intake chart; (Annex 7)
- Plan feeding for each chid (during ward round)
- Compile feeding plans for each child onto a feeding chart for the entire ward using Daily Ward Feed Chart (Annex 7). Can be used by the kitchen staff.

Feeding times

- Select a time of day that each "feeding day (24 hours)" will start.
- Plan times for 2-hourly, 3-hourly, and 4-hourly feeds.
- Ensure no feeds occur at times of shift changes.
- Keep in mind that a few children, those with hypoglycaemia or continued vomiting, may be on a special half-hourly or hourly feeding schedule. Ensure the more frequent feeds are provided outside the normal schedule.

Weighing and bathing

- Daily weighing will need to occur at about the same time each day, preferably one hour before or after a feed.
- Children are on 2-hourly feeding schedules re new to the ward and are likely to be ill to be bathed.
- Children on 3-hourly and 4-hourly schedules may be bathed when they are weighed.

Shift changes

- Normally 3 shifts per day and not to schedule feeding during a shift change.

Annex 20: Example of Ward Schedule

Time	Activities by feeding schedules			Other ward activities/comments
	2-hourly	3-hourly	4-hourly	
Shift change 6.30-7.00; instructions given				
7.00	Weigh	Weigh, Feed	Weigh, Bathe	
8.00	Feed			Paediatrician / MO review each child's past 24-hour food intake chart and weight; plans feeding for the day; completes daily ward feed chart
9.00				Prepare feeds for next 12 hours; distribute individual charts to bed
10.00	Feed	Feed	Feed	Start of new "feeding day"
11.00				Organised play, parent education
12.00	Feed			
Shift change 12.30-1.00pm; instructions given				
1.00pm		Feed		
2.00	Feed		Feed	
3.00				Organised play, parent education
4.00	Feed	Feed		
5.00				Organised play, parent education
6.00pm	Feed		Feed	
Shift change 6.30-7.00pm; instructions given				
7.00pm		Feed		
8.00	Feed			
9.00				Prepare feeds for next 12 hours
10.00	Feed	Feed	Feed	
11.00pm				
12.00am	Feed			
1.00		Feed		
2.00	Feed		Feed	
3.00				
4.00	Feed	Feed		
5.00				
6.00am	Feed		Feed	

Annex 21: Daily ward feed chart for in patient management

Date:_____ **Ward:**_____

Name of The child	F75			F100		
	Number of feeds	**Amount/feed(ml)**	**Total (ml)**	**Number of feeds**	**Amount/feed(ml)**	**Total (ml)**
F75 (total ml) needed for 24 hours				**F100 (total ml) needed for 24 hours**		
Amount needed for _____ hours*				**Amount needed for _____ hours***		
Amount to prepare (round up to whole litre)				**Amount to prepare (round up to whole litre)**		

*Divide daily amount by the number of times food is prepared each day. For example, if feeds are prepared every 12 hours divide daily amount by 2.

Annex 22: Calculation of weight gain

(To be calculated after the child start taking either F100 or RUTF)

Weight gain in (g/kg/day) =

Discharge weight in g – Admission weight in g

Admission weight in kg x number of days in the programme

(E.g. Admission weight of the child = 9.5kg = 9500g, Discharge weight of the child = 11.5kg = 11500g, Number of days in the programme = 30 days

Weight gain = $\frac{11500 - 9500}{9.5 \times 30} = \frac{2000}{285}$ = 7.0 g/kg/day)

(If child had oedema on admission take the initial weight as the weight the day of disappearance of oedema)

Average weight gain in the clinic =

Total of daily weight gain of every child (g/kg/day)

Total number of children discharged

(E.g. Daily wt gain of 1 child= 5g/kg/day, Daily wt gain of 2nd child = 7g/kg/day, Daily wt gain of 3rd child = 6g/kg/day

Total of daily weight gain of every child = 5 + 7 + 6 = 18

Average weight gain in the clinic = 18 / 3 = 6)

Length of stay (days):

Average length of stay =

Sum of length of stay (in days)

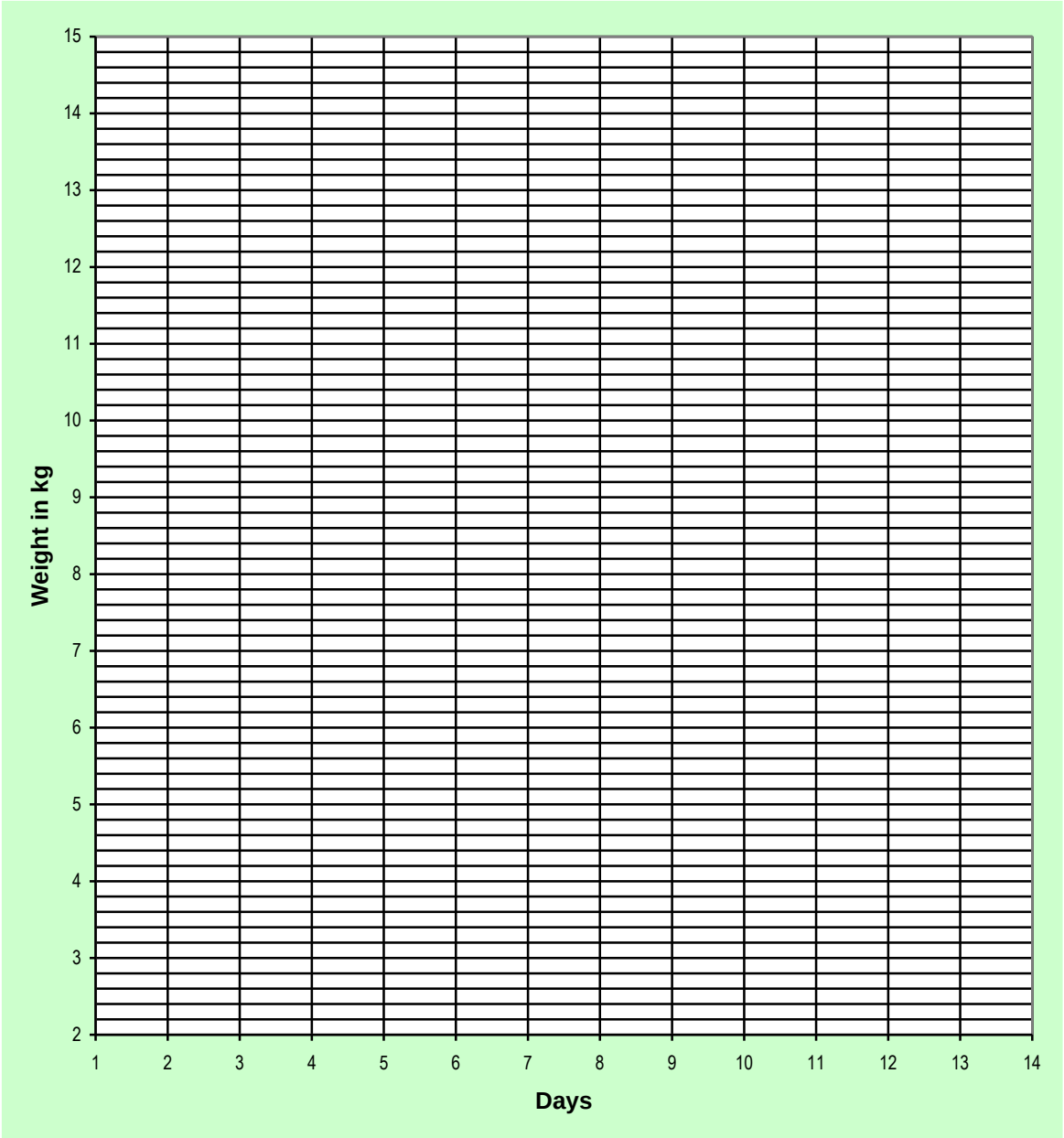
Total number of children discharged

(E.g. Length of stay of 1 child= 20, Length of stay of 2nd child= 30, Length of stay of 3rd child= 55, Sum of length of stay = 20 + 30 + 55 = 105

Average length of stay = 105 / 3 = 35 days)

Annex 23: Weight gain chart for Hospital use

Weight the child daily, record the weight in the chart. Each day plot the child's weight on the chart. Plot the starting day at day 1. Mark each point with an X or large dot so that it shows up clearly. Connect the points to see the child's progress. The above chart can be used to mark the dates when F 75 or F100 or RUTF is started.



Annex 24: Weekly/Fortnightly summary form

(Should be submitted to MOH by the relevant PHM / in charge of the centre, MOH should send the summary to the DPDHS)

Reporting period: …../……/200… to …../…../200..

Name of the camp / clinic / hospital / MOH:……District:……Month …….200….

Age category (Months)	Total no. of children at beginning of the period (A)	ADMISSIONS								Discharge / Exits					Total no. of children end of the period (O=I-N)	Average weight gain	Average length of stay	No. of RUTF pk. issued
		New Admissions			Transfer from				Total admissions (I=D+E+F+G+H)									
		<-3SD (B)	Other ©	Total (D=B+C)	Defaulters returned (E)	Inpatient (F)	Supplementary feeding (G)	Other NRP (H)		Cured (J)	Deaths (K)	Defaulters (L)	Transfer (M)	Total (N=J+K+L+M)				
6-12																		
12-24																		
>24																		
Total																		

Average weight gain in the clinic = Total of daily weight gain of every child (g/kg/day)/Total number of children discharged

Average length of stay = Sum of length of stay (in days) / Total number of children discharged

Annex 25: Referral Form

REFERRAL FORM

Referral from……to…….

Date:……

Name of the child:……

Registration No.:……..

Age in months: …… Sex: Male / Female

MOH area:…….. **PHM area:**……..

Reason for referral:

……

……

- Loss of appetite,
- Lower respiratory tract infection,
- Severe palmar pallor,
- High fever,
- Severe dehydration,
- hypothermia,
- extensive infection,
- convulsions, not alert
- bilateral pitting oedema,
- other conditions that require in-patient care according to clinicians

REFERRAL

Back referral from……to…….

Date:……

Condition on discharge:……

Follow up required:

……

……

Annex 26: Guide to family- food for the child of 1-5 years

Amount of cooked foods needed per day through 3 main meals to give enough energy and nutrients (raw amounts in parenthesis)	
Food groups	**Children 1-5 yr 1650 to 1800 Kcal**
Rice	3-4 cups (230 grams)
Fruit	1-2 (100 grams)
Pulses (lentil, green gram, chickpea, cowpea)	4 table spoon (15g*4 = 60 g)
Vegetables	3 table spoons (50 gm)
Leafy vegetables	3 table spoons (50 gm)
Fish, meat, eggs,	2 small (50g)
Milk or milk products	2 (400ml)
Fat and sugar	25g of sugar and 30ml of grated coconut, coconut milk, oil, butter, margarine

- 1 cup = 200ml, 1 table spoon = 15ml.

Annex 27: Community mobilization

The success of community based nutrition rehabilitation programme depends on creation of good understanding of the programme by the communities and attaining of high coverage of the target population. This in turn depends on clear description of the target population and effective communication of the objective of the programme to the community and creating a mechanism for their participation in decision making processes. This will help avoid misunderstanding and attracting the wrong target group to the programme. Community's owned resource people/volunteers need to be used to reach families, participate in case findings and participate in follow up of children participating in the rehabilitation programme. The following steps need to be put in place to support effective community mobilization – community sensitization, case finding, follow-up and ongoing sensitization.

1. Community sensitization:
Community sensitization promotes good understanding of the programme objectives and approaches. The following steps will help undertake effective sensitization:

- Meet village/community leaders explaining about the programme and their roles in assisting to mobilize community's support for the programme.
- Identify and train community volunteers and define their roles and functions.
- Announcing the programme and the schedule of activities to the people

Regular meetings with community leaders, camp mangers and service providers need to be established and implemented. These regular meetings should be used to discuss the situation of children benefiting from the programme, progress, defaulters, referral and constraints faced in the course of porgramme implementation and seeking solutions for the problems.

2. Follow up:
Depending on the local situation and availability of human resources, children identified to be included in the programme need to be followed up for their regular attendance, defaulting and changes in their situation. The community volunteers play critical role in follow up of cases.

3. Case finding:
A number of outlets need to be used to identify new cases and ensure that children who need to benefit from the programme actually get the benefit. Community volunteers who have in direct contact with families and community need to be used in active case findings and referral. This will be supplemented by repeated screening of under five children.

Annex 28: Content of Sensitisation messages

The following points should be explained:

Undernourished children are much more likely to contract illnesses, with or without complications, than their well nourished counterparts. With appropriate nutrition management in hospitals, clinics, homes and regular follow-up care, growth and development of many children can be improved.

What the programme does:

- The programme cares for undernourished children and offers them food that will allow them to recover. Target groups are children aged 6 months to 5 years.
- The programme identifies and admits children to the programme by measuring and comparing them to a normal healthy child. This shows whether they need special food or not.

How the programme operates:

- The mother, father or care giver brings the child to the hospital or clinic, where appropriate anthropometric measurements are taken.
- If the child is severely under nourished and no other complications, he/she is given special food to take home.
- The mother / care giver should feed the special food to the child according to the advice given by the health worker. They are advised how to prepare the food and feed the child and keep him/her healthy.
- They return to the clinic every week or every two weeks depending on the feasibility for health worker.
- When the child gets better and his/her weight is back to normal, they are discharged from the programme.

Annex 29: Supplementary Feeding

Food ration

- Dry food ration is provided monthly (indicate number of packets per child).
- Thriposha / CSB / UNIMIX – 50g daily provide 150-190 kcal/day
- UNIMIX – 1500g per month per child.

Thriposha

- It is a cooked ready-to-eat supplementary food

UNIMIX or Corn Soya Blend

- UNIMIX is pre-cooked supplementary food but is not an instant product. It should be cooked for 10 minutes, **but not longer**.
- Before starting to cook, please make sure that the water which is used to make porridge is **safe. Wash your hands** thoroughly with soap and clean water before preparing the porridge.

Method of Preparation

3 full table spoon of UNIMIX /CSB

1 cup of water

- Mix UNIMIX with some drinking water to make a paste
- Add the rest of the water
- Bring to boil for 10 minutes (no more – no less) and serve.

Recipes (around 400kcal)

1. UNIMIX/CSB 3 full tablespoon
   Water 1 cup
   Sugar 1tablespoon
   (Sugar should be recommended for children only after 9/12 of age)
   Oil / margarine / butter 1tablespoon
   OR
   Coconut 3tablespoon

REFERENCES

1. Ashworth A, Khanum S, Jackson A and Schofield C. Guidelines for the inpatient treatment of severely malnourished children. World Health Organisation: SEARO Technical publication No. 24; 2003.
2. World Health Organisation. Management of severe malnutrition: a manual for physicians and other senior health workers. Geneva;1999.
3. Prudhon C. Briend A. Prinzo ZW. Daelmans BMEG. Mason JB. WHO, UNICEF and SCN informal consultation on community-based management of severe malnutrition in children. SCN nutrition policy paper No.21. Vol. 27; 3; 2006 September.
4. Valid International, Community based Therapeutic care (CTC); A field manual, First Edition, 2006.
5. World Health Organisation. Introduction – Module 1. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
6. World Health Organisation. Initial management – Module 3. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
7. World Health Organisation. Initial management – Module 3. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
8. World Health Organisation. Initial management – Module 3. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
9. World Health Organisation. Feeding – Module 4. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
10. World Health Organisation. Daily care – Module 5. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.

11. World Health Organisation. Monitoring and problem solving – Module 6. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.
12. World Health Organisation. Involving mothers in care – Module 7. Training course on the management of severe malnutrition. Department of Nutrition for health and development. 2002.