

**Consensus Statement of the
INDIAN ACADEMY OF PEDIATRICS**

**on Integrated Management of
Severe Acute Malnutrition**

Mission of the Indian Academy of Pediatrics (IAP):

IAP is in cognizance of the acute necessity of undertaking immediate remedial measures for an estimated 8 million children below 5 years of age who are suffering from Severe Acute Malnutrition (SAM). IAP is committed to provide academic as well as programmatic support to a concerted national effort in this direction. We commit the service of over 300 branches and 18,000 pediatricians for a systematic and structured effort to address this issue.

The Problem:

- Severe Acute Malnutrition (SAM) is a major public health issue. It afflicts an estimated 8.1 million under-five children in India (1). Nearly 0.6 million deaths and 24.6 million DALYs (Disability Adjusted Life Years) are attributed to this condition. Diarrhea and pneumonia account for approximately half the under-five deaths in India, and malnutrition is believed to contribute to 61% of diarrheal deaths and 53% pneumonia deaths(2). Thus, strong scientific evidence exists on synergism between undernutrition and child mortality due to common childhood morbidities including diarrhea, acute respiratory infections, malaria and measles. In SAM, the case fatality rates related to these morbidities are excessively high.

Newer Concepts:

- The understanding of pathophysiology of SAM (including edematous malnutrition) has improved.
- New internationally accepted growth charts have become available, in which data from Indian children has also been included. Determination of SAM on the basis of z-scores using WHO Growth charts is considered statistically more appropriate than cut-offs based on percentage weight deficit of the median.
- Dietary interventions using WHO F-75 and F-100 formulae (or analogues) in the management of inpatient care of SAM have improved outcomes including reduced mortality, early recovery and higher weight gain. It is possible to implement this intervention in hospitals and healthcare facilities.
- Community-based programs have shown success in the management of SAM in emergency and non-emergency situations.

- Considering the fact that many children with SAM can be successfully managed on outpatient basis and even in the community, it is no more considered necessary to advise admission of all children with SAM in a healthcare facility. This becomes pertinent in view of the economic and social burden that hospitalization entails on families that are already battling poverty. Further, our country does not have sufficient hospital beds for offering inpatient care to all children with SAM.
- An integrated management of malnutrition is likely to yield more dividends. Thus management of SAM should constitute an important component of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) programme. Management of SAM should not be a stand alone program. It should integrate with community management therapeutic program and linkages with child treatment center, district hospitals and tertiary level centers offering inpatient management for SAM.

The Process for evolving Consensus Guidelines:

Taking these developments into consideration, IAP decided to organize and conduct a National Consultative Meeting on Integrated Management of Severe Acute Malnutrition (SAM). It was held in Mumbai on 16th and 17th October 2010. It was attended by the invited experts in the field (*Appendix 1: List of Participants*). Extensive discussions were held as per the program (*Appendix 2: Program of the Workshop*). The participants were then divided into six groups for detailed discussions (*Appendix 3: Group tasks and members of individual groups*). The groups deliberated on various issues pertaining to the task assigned and presented recommendations of the groups in a plenary session. The participants made a list of recommendations after extensive discussions. A Writing Committee (*Appendix 4: List of Writing Committee members*) was formed and was entrusted with the task of drawing a Consensus Statement on the basis of these Recommendations.

Diagnosis of SAM

In children between the ages of 6 and 60 months, SAM may be diagnosed on the basis of any of the following criteria (3):

- (i) Weight/height or Weight/length < -3z score, using the WHO Growth Charts
- (ii) Visible severe wasting
- (iii) Bipedal edema of nutritional origin
- (iv) Mid-upper arm circumference (MUAC) < 115 mm.*

*For infants below 6 months, Criteria (i) or (ii) or (iii) above should be used till data on MUAC below 6 months becomes available.

*IAP guidelines of 2006 have stated MUAC <110 mm as one of the criterion. Research in India is required to arrive at critical MUAC that will screen and produce similar results when we use weight for height <-3 Z score, using WHO new growth charts, as the criterion. As infants and children from India were also included while formulating WHO growth charts, a MUAC below 115 mm, as being used for other countries, should be adopted till we have more Indian data.

Active detection of children with SAM

- Early detection of children with SAM will ensure that these children will be identified before they develop medical complications. This would mean management of many of them before their prognosis worsens and it would also reduce the need for hospitalized care (4, 5). Health professionals and healthcare providers should detect children with SAM at every opportunity provided by health contacts, be it for a medical complaint or for health promotional measures (e.g. growth monitoring or immunization). This can be undertaken at every health facility (Primary Health Center and sub-center, health posts, hospitals, day-care centers, etc) and even in the community and *anganwadis* by healthcare workers.
- MUAC is a simple measure for the detection of SAM. Screening of SAM children in the community can be done using MUAC tape. Good quality, non-stretchable, long lasting MUAC tapes should be available at every healthcare facility.

Screen Children

Weight for height <-3SD, or Visible Severe wasting, or Bipedal edema of nutritional origin, or Mid-upper arm circumference <115mm

Yes

SAM

Failed Appetite test,
Presence of acute medical complication,
or Presence of bilateral pitting edema or
Age ≤ 6mo

No

No SAM

Yes

Inpatient
care

Failed appetite test or medical
complication

No

Outpatient
care

Discharge criteria

Child:

Good Appetite
No edema
Consistent weight gain (>5gm/kg/d
for 3 consecutive days)
Completed appropriate anti-
microbial treatment appropriate
immunization initiated.

Care giver:

Trained, motivated & skilled to
provide care

Discharge from inpatient care

Weight for height \geq - 2SD
MUAC > 115 mm

Regular Health Care
Program Usual health
promotion activities
Follow-up by AWW

(Adapted from WHO Growth Standards and identification of Severe Acute Malnutrition in infants and children. A joint statement of WHO and UNICEF. 2009)(6)

Appetite Test

Appetite test is an important criteria to differentiate a complicated from an uncomplicated case of SAM and therefore decide if a patient should be sent for in-patient or out-patient management. SAM children with poor appetite are at immediate risk of death and they will not take sufficient amounts of the diet at home to prevent deterioration and death.

This test has not been standardized or published in diverse Indian settings with different types of therapeutic foods. In the African settings, it is usually conducted in a quiet area with Ready to Use Therapeutic Food (RUTF). In African setting, a child, not consuming the minimum recommended amount of RUTF (Table 1), is labeled as failed 'Appetite Test' and is referred for in-patient care. It may be possible to extrapolate these guidelines to the therapeutic food being used in the Indian setting.

Table 1:
The minimum amount of RUTF that should be taken to pass the Appetite test based on experience from African setting

Body weight (kg)	<i>Minimum amount of RUTF to be consumed for passing the Appetite Test (ml or grams)</i>
>4	15
4 -6.9	25
7 -9.9	35
10 -14.9	50

- The appetite test should be carried out at each visit for patients not hospitalized, particularly those who do not gain weight steadily.
- Failure of an appetite test at any time is an indication for full evaluation and probable transfer for in-patient assessment and treatment.
- If the appetite is "good" during the appetite test and the rate of weight gain at home is poor then a home visit would be required because this may indicate a social problem at household level or extensive sharing of the medical nutrition therapy. A simple "trial of feeding" at residential care may be needed to differentiate a difficulty with the home environment from a metabolic problem with the patient

Triage for inpatient care

- Triage is undertaken in the community or in any facility that the child is brought initially to find out if children identified to have SAM need admission to the facility care like child treatment center or district or tertiary hospital.

Indications for inpatient care include:

- (i) Presence of a medical complication
 - (ii) Reduced appetite (as judged on the basis of a failed appetite test)
 - (iii) Presence of bilateral pitting edema
 - (iv) Age \leq 6months
- **Outpatient Care:** Children with SAM who do not have any criterion for inpatient care can be managed under an Out Patient Therapeutic Program (OTP) center closest to the child's home. There is a need to establish such a program as a part of Integrated Child Development Scheme (ICDS)/ RCH-II/ IMNCI-ANM, NRHM-ASHA.
 - There is a need to provide "therapeutic food" broadly adhering to the WHO and UNICEF specifications; this Medical Nutrition Therapy(7) is based on sound scientific principles with a balanced composition of type 1 and type 2 nutrients for consumption by children suffering with SAM who are being managed in the community or at home(8). One form of "therapeutic food" is Ready to Use Therapeutic Food (RUTF), which is a high-energy food, available in a ready-to-use form with long shelf-life and requiring no preparation at the point of use. This specific composition has been tested and proved effective in functional recovery of SAM children, primarily in the African settings (9). Controlled trials and experience with RUTF in India is limited and further, there is no robust comparative data documenting the benefits of this formulation over locally produced analogous medical nutrition therapy or augmented home food.
 - A rough guide about the amount of therapeutic food to be consumed is summarized in the Table below. Breast feeding should be continued while the child is on therapeutic food. Other foods may be given if child has good appetite and has no diarrhea.

Weight	Amount of RUTF per day
3 - 4.9 kg.	105 – 130 g/day
5 - 6.9 kg.	200 – 260 g/day
7 - 9.9 kg.	260 - 400 g/day
10 – 14.9 kg.	400 - 460 g/day

The amount is to be given in 2-3 hourly feeds along with plenty of water.

- There is a need to generate Indian data in this regard so that an effective and safe therapeutic food that is acceptable to children and meets WHO/UNICEF specification can be made available under the program. It must be emphasized to the families and to the society at large, that the therapeutic food is to be used only in children with SAM as a part of therapy. It is not meant to be a supplementary food for other children or a part of regular diet. In order to ensure that the same is readily available and can reach the target population, the appropriate notification(s) for use of such therapeutic food and for its procurement through institutional mechanisms and its distribution through appropriate channels e.g. nutrition rehabilitations centers, Anganwadis, etc. would be ideal and desirable. To ensure that it is not misused, the Government may consider implementing appropriate restrictions such as restricting its availability only under the program for children with SAM and prohibiting its widespread availability.
- Outpatient management is not recommended for children aged six months or less with SAM.
- The caretaker/ mother should also be counseled about Breast Feeding, supplementary care hygiene, optimal food intake, immunization and other appropriate health promotional activities.
- Outcome of treatment can be defined as follows:
 - (a) Non-responder/ Primary Failure (i) Failure to gain any weight for 21 days, or (ii) Weight loss since admission to program for 14 days.
 - (b) Secondary Failure or Relapse (i) Failure of Appetite test at any visit or (ii) Weight loss of 5% body weight at any visit. Non-responders and children who develop a danger sign at any time during first 4 weeks, the child should be referred to a hospital.
 - (c) Defaulters: Not traceable for at least 2 visits
- Children can be discharged from the program if *any of* the following criteria are satisfied: (i) Weight/Height by WHO growth charts of at least -2 Z score; or (ii) Weight gain more than 15% and child being free of edema; or MUAC >115 mm. The use of weight gain more than 15% as the discharge criterion is rational as -2SD and -1SD roughly correspond to 9% and 19% weight gain, respectively.

Thereafter, the child can be referred for usual health care program and growth promotion activities can be ensured by *anganwadi* workers (AWW) Health Care Workers and Health care Providers.

Inpatient Care

The principles of management are as outlined in the earlier IAP recommendation(10). The following measures should be undertaken for children requiring inpatient care:

- Admission in a warm area separate from other children with infection
- Prevent, look for and manage:

Hypoglycemia

Hypothermia

These are to be treated

Dehydration

using IAP guidelines 2006

Electrolyte disturbances

Infection and sepsis

Micronutrient deficiency

Children above 6 months of age

- Early initiation of appropriate feeding is an important step in the management of SAM. Therapeutic feeding conforming to F-75 composition can be used as an initial starting formula in the acute phase, followed by F-100 composition in the rehabilitation phase.

Infants less than 6 months

- *Prospect of continuing or re-initiating breastfeeding:* Breastfeeding should be encouraged in children (aged less than 6mo) and having SAM. Supplemental suckling technique can be used to support and enhance breastfeeding. These children should be monitored by determining weight gain and amount of supplemental feeding taken. The supplemental feeding can be slowly withdrawn as the breast milk output increases and baby shows weight gain. A baby showing consistent weight gain on exclusive breastfeeding can be discharged from the inpatient facility. The baby's growth can then be monitored on outpatient basis.
- *No prospect of continuing or re-initiating breastfeeding:* These babies should be treated with F-75 composition therapeutic food in the acute phase and response monitored in a manner described above.

- It is necessary to monitor the child and check for failure to respond to therapy. Failure to respond to therapy should prompt a review of the case, assessment of actual intake and checking for untreated infection and psychological problems.

Continuation of breastfeeding should be encouraged.

- Sensory stimulation in the form of a tender loving care, cheerful stimulating environment, structured play therapy, initiation of physical activity as soon as the child is well and maternal involvement in comforting, feeding and play are important aspects of overall management.

Supplementary Suckling Technique

The supplementation is given using a tube the same size as 8NGT (5NGT can be used and is better for the infant, but the milk should be strained to remove any small particles that block the tube.

- The appropriate amount of supplemental suckling milk is put in a cup. The mother or assistant holds it.
- The end of the tube is put in the cup.

- The tip of the tube is put on the breast at the nipple and the infant is offered the breast in the normal way so that the infant attaches properly.
- At first, cup should be placed about 5cm to 10cm below the level of the nipples so the SS-milk can be taken with little effort by a weak infant. It must NEVER be placed above the level of nipple, or else it will flow quickly into the infant's mouth by siphonage with a major risk of inhalation. As the infant becomes stronger the cup should be lowered progressively to about 30 cm below the breast.
 - It may take a day or two for the infants to get used to the tube and the taste of the mixture of milks, but it is important to persevere.

➤ Children with SAM above 6 months of age can be discharged from the health facility once the child and the caretaker satisfy all the following criteria.

Child:

Has a good appetite (eating at least 120-130 Cal/kg/d) along with micronutrients

Has lost edema

Has shown consistent weight (>5gm/kg/d) on three consecutive days

Has completed anti-microbial treatment

Appropriate immunization has been initiated

Mother or Care-taker:

Has been trained to prepare and provide appropriate feeding

Has financial resources to feed the child

Has been motivated to follow the advice given

- Children with SAM below 6 months of age can be discharged from the health facility once the baby shows consistent weight gain on oral feeds and has no medical complications. Babies on breast feeding should be showing this weight gain based on exclusive breast feeding.
- Training and involvement of the mother/ caretaker is an important aspect of inpatient care
- After discharge the child should be referred for further care to the appropriate OTP center and continue the Integrated Management.

Organizational Issues:

- In patient and Out patient treatment should be One Integrated Program.
- The program should be integrated with other existing health programs intended to provide health promotion activities
- After the initial feasibility testing, the program may be initiated in a few high-risk districts of the country. After assessing the effectiveness of the programmatic interventions, the program can be scaled up to involve all the districts in the country in a phase-wise manner
- The effectiveness of the overall program needs to be monitored in terms of number of beneficiaries and, improvement in mortality, among others
- The various segments of the program (facility based inpatient care and outpatient care/ community-level management) need to be linked; so that children can followed-up and continued care is assured. This would also help in monitoring and judging effectiveness of the program
- It is necessary to encourage indigenous commercial production of “therapeutic foods” with strict quality control.

Training:

- All sections of the healthcare providers need to be trained in the Integrated management of SAM
- Pediatricians should be motivated and trained for taking a leadership role at national/state/district level as this is a child rights issue
- Health professionals and medical teachers should be enrolled as trainers for the program after holding structured training workshops
- Assessment of the effectiveness of training should be an essential component of the training program
- The Universities should be encouraged to accord a prominent position to the detection and Integrated Management of SAM in the pediatric curriculum.

Research Priorities:

- Research priorities should address gaps in knowledge related to SAM.
- Programmatic Research for assessing the cost-effectiveness of various interventions used in the program

Public and Media Participation:

- The presence of children with SAM is a reality. The program to tackle SAM can only be successful through media participation and creation of public awareness.

Role of Indian Academy of Pediatrics:

IAP can play an important role in:

- Providing technical advice to the government regarding appropriate interventions and in formulating management guidelines and training modules
- Assisting the program through conduct of training programs
- Creating public awareness and ensuring media participation
- Recommend the Medical Council of India and the Universities to include management of SAM in the medical curriculum for the subjects of Pediatrics and Preventive and Social Medicine

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Appendix 1:

A. List of Participants

SR. NO.	NAME	PLACE
01	Dr. Simin F Irani	Mumbai
02	Prof. Michel Golden	Ireland
03	Dr. Pramila Menon	Pune
04	Dr. Phadke	Mumbai
05	Dr. Rupal Dalal	Mumbai
06	Dr. KG Menon	Pune
07	Dr. Tanmay Amladi	Mumbai
08	Dr. Manohar Agnani	Bhopal
09	Dr. Reshma Patel	Bhopal
10	Dr. Sandeep B Bavdekar	Mumbai
11	Dr. Victor Aglayo	Delhi
12	Dr. Manoj Rathi	Amravati
13	Dr. MKC Nair	Trivandrum
14	Dr. S Narayan	Delhi
15	Dr. SS Bhambal	Bhopal
16	Dr. Anuradha Bose	Vellore
17	Dr. KS Multani	Bangalore
18	Dr. ML Agnihotri	Now-Gong
19	Dr. MV Mangalni	Mumbai
20	Dr. Girish Agarwal	Bareilly
21	Dr. Vasant Khaltakar	Nagpur
22	Dr. Maoor K Naganath	Chennai
23	Dr. Arun Bansal	Chandigarh
24	Dr. Evilet Sequeira	Unicef
25	Dr. Alka Jadhav	Mumbai
26	Dr. Shaila Aiyer	Vadodara
27	Dr. A Fernandez	Mumbai
28	Dr. AP Dubey	New Delhi
29	Dr. Panna Choudhury	New Delhi
30	Dr. Sameer H Dalwai	Mumbai
31	Dr. Dhanesh Volvoikar	Goa
32	Dr. Jayendra Parulekar	Sawantwadi
33	Dr. KV Radhakrishna	Hyderabad
34	Dr. Bharati Kulkarni	Hyderabad
35	Dr. RK Gupta	Jaipur
36	Dr. Omkar Khandelwal	Raipur
37	Dr. Deepak Ugra	Mumbai
38	Dr. Tarun Patni	Jaipur
39	Dr. Sandhya Khadase	Mumbai

B. List of Participants who could not attend but participated in finalization of the Recommendations

SR. NO.	NAME	PLACE
1	Dr Rohit Agarwal	Mumbai
2	Dr C P Bansal	Gwalior
3	Dr H P S Sachdev	New Delhi
4	Dr Uday Bodhankar	Nagpur
5	Dr Sashi Vani	Nagpur
6	Dr Umesh Kapil	New Delhi

Appendix 2:

Program of the Workshop

National Consultative Meeting on Guidelines by the Indian Academy of Pediatrics (IAP) for Management of Severe Acute Malnutrition.

16th, 17th October 2010, Mumbai

Expected Outcome:

- IAP Protocol for Integrated Management of Severe Acute Malnutrition is reviewed in light of emerging global evidence and Recommendations.

DAY ONE

09:00 hrs - 09:40 hrs	<ul style="list-style-type: none">• Introduction of the participants.• Purpose of the Consultation.• Current scenario of under nutrition and its implication-India.• Global scenario on Integrated Management of Severe Acute Malnutrition.	Dr. Deepak Ugra, President IAP, Dr Tanmay Amladi, Honorary Secretary - General, IAP Dr. A P Dubey, Director-Professor and Head of the Department of Pediatrics, Maulana Azad Medical College, New Delhi. Introduction by Professor Michael Golden, International Authority on SAM
09.45 hrs - 10.30	IAP Guidelines-2006 on Facility- based care for children with SAM.	Dr. Shinjini Bhatnagar
10.30- 11.15	IAP Guidelines-2006 on Community-based care for children with SAM.	Dr.Panna Choudhury
11:15 hrs - 11.30.	Tea Break	
11:30 hrs - 13:30 hrs	Integrated Management of SAM - Global Evidence, Guidelines and Practice (Part 1)	Professor Michael Golden
13:30 hrs - 14:15 hrs	Lunch	
14:30 hrs - 17:00 hrs	Integrated Management of SAM - Global Evidence, Guidelines and Practice (Part 2)	Professor Michael Golden
17:00 hrs - 18:30 hrs	1. Open Discussions 2. Proceedings of the day	IAP
18.30-20.30 hrs		IAP

	<p>Group Work:</p> <ul style="list-style-type: none"> • Group A -Facility-based Care for Children with SAM. • Group B -Community-based Care for children with SAM. 	
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DAY TWO

09:00 hrs - 11.00 hrs	<p>Group Presentations:</p> <ul style="list-style-type: none"> • Group A - Facility-based Care for children with SAM. • Group B - Community-based Care for children with SAM. 	
11:00 hrs-11.30 hrs	Tea-break	
11:30 hrs - 13.00hrs	<ul style="list-style-type: none"> • Open discussions • Finalization of the protocols • The Way Forward <ul style="list-style-type: none"> ➤ National Consensus with GOI. ➤ Roll out plan. 	IAP
13.30 hrs -14.30 hrs	Lunch	

Appendix 3: Group tasks and members of individual groups

A. Facility Base Care Gr for children with SAM	B. Community Base Care for Children with SAM
<p>Group-A1</p> <p>1. <i>Criteria for:</i></p> <ol style="list-style-type: none"> <i>Diagnosis</i> <i>Admission</i> <i>Discharge</i> <i>Screening</i> <p>2. <i>Complications</i></p> <p>Group A1</p> <ol style="list-style-type: none"> Professor Michael Golden Prof A P Dubey Dr Sheila Aiyer DR Manohar Adnani Dr MKC Nair Dr M L Agnihotri 	<p>Group-B1</p> <p>1. <i>Criteria for:</i></p> <ol style="list-style-type: none"> <i>Diagnosis</i> <i>Admission</i> <i>Discharge</i> <i>Screening</i> <p>Group B1</p> <ol style="list-style-type: none"> Prof Panna Choudhury Dr Mrudula Phadke Dr Simin Irani Dr Armida Fernandez Dr S S Bhambal Dr Victor Aguayo
<p>Group-A2 Routine management</p> <p>3. <i>Care for special cases</i></p> <ol style="list-style-type: none"> <i>Under 6 mo</i> 	<p>Group-B2</p> <p>3. <i>Routine management</i></p> <p>4. <i>Care for special cases</i></p>

- b. HIV**
- c. TB**
- d. Twins**
- e. Disabled**
- f. SGA babies**

Group A2

1. Dr Mamta Manglani
2. Dr Sandeep Bawdekar
3. Dr Tanmay Amladi
4. Dr Pramila Menon
5. Dr Manoj Rathi
6. Dr Kawaljit Singh Multani
7. Dr Evelet Sequeira
8. Ms Gurdeep Marwah

- e. Under 6 mo**
- f. HIV**
- g. TB**
- h. Twins**
- i. Disabled**
- j. SGA babies**

Group B2

1. Dr Alka Jog
2. Dr Samir Dalwai
3. Dr Rupal Dalal
4. Dr Anuradha Bose
5. Dr Bharat Kulkarni
6. Dr Onkar Khandelwal

Group-A3

- 1. Organization of IMSAM**
- 2. Involvement of media and technology**
- 3. Inclusion on medical curriculum**

Group A3

1. Dr M K C Nair
2. Maj. K Nagaraju
3. Dr Radhakrishna Kankipati
4. Dr Sushma Narayan
5. Dr Jayendra Parulekar
6. Dr Girish Agarwal

Group-B3

- 1. Organization of IMSAM**
- 2. Involvement of media and technology**
- 3. Inclusion on medical curriculum**

Group B3

1. Dr Arun Prasad
2. Dr Tarun Patni
3. Dr R K Gupta
4. Dr Vasant Khalatkar
5. Dr Dhanesh Volvoikar
6. Dr Resha Patel
7. Ms Raji Nair

Appendix 4:

List of Writing Committee members (in alphabetical order)

Serial No.	Name of the Member	Designation
1	Dr Agnani Manohar	Mission Director, NRHM, Madhya Pardesh
2	Dr Bavdekar Sandeep	Prof and Head, Dept of Pediatrics, BYL Nair Hospital and TN Medical College
3	Dr Choudhury Panna	Immediate Past President 2010, IAP
4	Dr Dalal Rupal	Consultant Pediatrician, Foundation for Mother & Child Health, Mumbai
5	Dr Dalwai Samir	National Coordinator, National Consultative Meeting on Management of SAM
6	Dr Dubey A P	Chairperson, Nutrition Sub Chapter, IAP
7	Dr. Kapil Umesh	Prof & Head, Human Nutrition Unit, AIIMS, New Delhi
8	Dr Sachdev H P S	Past President, IAP
9	Dr Ugra Deepak	President 2010, IAP

Appendix 5:

Acknowledgements:

1. Office Bearers and Staff Members at Central Office, Indian Academy of Pediatrics, Mumbai, for Logistical Support.
2. Staff Members, New Horizons Child Development Centre, Mumbai, for Graphics and Presentation Support.

Annexure

COMMUNITY-BASED MANAGEMENT OF SEVERE ACUTE MALNUTRITION

**A Joint Statement by the World Health Organization, the World Food Programme,
The United Nations System Standing Committee on Nutrition and the United Nations
Children's Fund**

Technical annex

Ready-to-use therapeutic foods

Ready-to-use therapeutic foods (RUTF) are high-energy, fortified, ready-to-eat foods suitable for the treatment of children with severe acute malnutrition. These foods should be soft or crushable and should be easy for young children to eat without any preparation. At least half of the proteins contained in the foods should come from milk products.

Nutritional composition

Moisture content	2.5% maximum
Energy	520–550 Kcal/100 g
Proteins	10%–12% total energy
Lipids	45%–60% total energy
Sodium	290 mg/100 g maximum
Potassium	1,110–1,400 mg/100 g
Calcium	300–600 mg/100 g
Phosphorus (excluding phytate)	300–600 mg/100 g
Magnesium	80–140 mg/100 g
Iron	10–14 mg/100 g
Zinc	11–14 mg/100 g
Copper	1.4–1.8 mg/100 g
Selenium	20–40 µg
Iodine	70–140 µg/100 g
Vitamin A	0.8–1.1 mg/100 g
Vitamin D	15–20 µg/100 g
Vitamin E	20 mg/100 g minimum
Vitamin K	15–30 µg/100 g
Vitamin B1	0.5 mg/100 g minimum
Vitamin B2	1.6 mg/100 g minimum
Vitamin C	50 mg/100 g minimum
Vitamin B6	0.6 mg/100 g minimum
Vitamin B12	1.6 µg/100 g minimum
Folic acid	200 µg/100 g minimum
Niacin	5 mg/100 g minimum
Pantothenic acid	3 mg/100 g minimum
Biotin	60 µg/100 g minimum
n-6 fatty acids	3%–10% of total energy
n-3 fatty acids	0.3%–2.5% of total energy

Note: Although RUTF contain iron, F100 does not. The composition of F100 can be found in *Management of Severe Malnutrition: A manual for physicians and other senior health workers*, World Health Organization, Geneva, 1999 (available online at <http://www.who.int/nutrition/publications/en/manage_severe_malnutrition_eng.pdf>).

Safety: The food should be free from objectionable matter. It must not contain any substance originating from microorganisms or any other

poisonous or deleterious substances, including anti-nutritional factors, heavy metals or pesticides in amounts that may represent a hazard to health.

Maximum toxin levels

Aflatoxin level	5 ppb maximum
Microorganism content	10,000/g maximum
Coliform test	negative in 1 g
Clostridium perfringens	negative in 1 g
Yeast	maximum 10 in 1 g
Moulds	maximum 50 in 1 g
Pathogenic Staphylococci	negative in 1 g
Salmonella	negative in 125 g
Listeria	negative in 25 g

The product should comply with the Recommended International Code of Hygienic Practice for Foods for Infants and Children of the Codex Alimentarius Standard CAC/RCP 21-1979 (available at <http://www.codexalimentarius.net/download/standards/297/CXP_021e.pdf>). All added mineral salts and vitamins should be on the Advisory List of Mineral Salts and Vitamin Compounds for Use in Foods for Infants and Children of the Codex Alimentarius Standard CAC/GL 10-1979 (available at <http://www.codexalimentarius.net/download/standards/300/CXG_010e.pdf>).

The added minerals should be water-soluble and should not form insoluble components when mixed together. The food should have a mineral composition that will not alter the acid base metabolism of children with severe acute malnutrition. In particular, it should have a moderate positive non-metabolizable base sufficient to eliminate the risk of metabolic acidosis. The non-metabolizable base can be approximated by the formula: estimated absorbed millimoles (sodium + potassium + calcium + magnesium) - (phosphorus + chloride). The mineral mix recommended for F100 by WHO is an example of a mineral mix with a suitable positive non-metabolizable base.

Information on producing RUTF locally is available at <http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/CBSM/tp_4.pdf>.

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Copies of this statement and further information may be requested from:



World Health Organization
Department of Child and Adolescent
Health and Development
Department of Nutrition for Health and
Development
20 Avenue Appia
1121 Geneva 27
Switzerland
Tel: +41 22 791 14 47
Email: cah@who.int or
nutrition@who.int
www.who.int



World Food Programme
Nutrition Service
Policy, Strategy and Programme
Support Division
Via Cesare Giulio Viola 68/70
Parco de Medici
00148 Rome
Italy
Tel: +39 06 6513 2214
Fax: +39 06 6513 3174
Email: nutrition@wfp.org
www.wfp.org



United Nations System
Standing Committee on Nutrition

United Nations System
Standing Committee on Nutrition
c/o World Health Organization
20 Avenue Appia
CH 1211 Geneva 27
Switzerland
Tel: +41 22 791 04 56
Fax: +41 22 798 88 91
Email: scn@who.int
www.unsystem.org/scn



United Nations Children's Fund
Nutrition Section
3 United Nations Plaza
New York, NY 10017
USA
Tel: +1 212 326 7000
Fax: +1 212 735 4405
Email: nutrition@unicef.org
www.unicef.org

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FORM

Consensus Statement of the Indian Academy of Pediatrics on Integrated Management of Severe Acute Malnutrition

I, Dr. endorse the "Consensus Statement of the Indian Academy of Pediatrics on Integrated Management of Severe Acute Malnutrition" prepared by the National Consultative Meeting of experts held at Mumbai on 16th & 17th October 2010 for IAP.

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Signature

Date: